On The Cover:
Mitochondrial membrane potential is negatively correlated to the distance from the nucleus. Membrane potential-dependent TMRM fluorescence intensity heat map shows most energized mitochondria to be found in the perinuclear (somal) compartment of a neuron. The analysis demonstrates a gradual proximal to distal decrease of mitochondria with high membrane potential. The data suggests that mitochondria located in distal neuronal compartments have lower (compared to somal mitochondria) bioenergetic capacity and as a result less resistant to stress.
# Table of Contents:

**Introduction** ............................................................... 3

**Statistics** ................................................................. 5

**Faculty, Residents and Visitors** ................................ 9
  - Faculty ............................................................. 10
  - Residents ........................................................... 12
  - Stuart Rowe Lecturer ........................................... 14
  - Visiting Scholars & Observers .............................. 15
  - Course Participants ............................................. 19

**Department Overview** .................................................. 23
  - History ............................................................... 24
  - Goals/Mission .................................................... 26
  - Organization ....................................................... 26
  - Accomplishments of Note .................................... 37
  - Future Initiatives ................................................ 42

**Educational Programs** ................................................... 47
  - Peter J. Jannetta Symposium Photos .................... 58

**Research** ................................................................. 241
  - Overview .......................................................... 242
  - Investigator Research Summaries ....................... 251
  - Research Grant Summary .................................... 262

**Alumni: Past Residents** .................................................. 267

**Donations** ............................................................... 275
Introduction

Advancing Care and Knowledge

Often times over the last few years—in these pages and in our quarterly department newsletter—you’ve read my comments about the importance of innovation and the leading role our department plays in advancing the newest and safest technologies in the care of our patients.

Our department has a proud heritage in bringing new neurosurgical techniques to the forefront of patient care. From Peter Jannetta’s groundbreaking microvascular decompression in the 1970s, to Dade Lunsford’s implementation of Gamma Knife stereotactic radiosurgery in the 1980s, to Juan Carlos Fernandez-Miranda’s and David Okonkwo’s use of high-definition fiber tractography and Paul Gardner’s advancement of endoscopic endonasal surgery of today, our faculty has long sought to utilize the latest technologies to secure the best outcome for our patients.

As neurosurgeons, our goal is to treat our patients in the safest and most efficient manner possible. However, as a neurosurgical academic institution, our mission is to not only treat our patients, but also to advance this treatment knowledge to others. We must advance this knowledge to the next generation of neurosurgeons, we must advance this knowledge to other medical personnel throughout the world, and we must advance this knowledge to the public at large.

As I scan the extensive compilation of lectures, papers and other education activities of our faculty and residents in this report, I am truly proud of the wide-ranging accomplishments of our department. Yes, in these pages, you’ll read about the innovative care and technologies offered by our many outstanding physicians, but you’ll also get a sense of the dedication and commitment our faculty has in playing a leading role in advancing this knowledge throughout the world.

In April of 2017, our department helped serve as host to the inaugural Peter J. Jannetta Symposium, a look at the latest innovations in neurosurgical care. This event brought together some of the leading minds of neurosurgery from around the country and around the world talking about what has been done, what is being done and what is in the pipeline in pushing the limits of neurosurgical care. The presentations were truly remarkable in scope and thought. Many of the presenters had direct connections with our department, either current faculty, former residents, or long-time collaborators. This is a reinforcement of the innovative and educational spirit that Dr. Jannetta helped instill here many years ago and proudly still exists today.

The spirit of translational innovation remains at the forefront of our concerted departmental efforts. David Okonkwo is researching new approaches to diagnose and treat traumatic brain injury with novel biomarkers. In addition, he is developing methodologies to help diagnose chronic traumatic encephalopathy (CTE). Raymond Sekula is investigating genetic and mechanistic underpinnings of trigeminal neuralgia with the intent of better understanding the role of voltage-gated sodium channels in the origin and maintenance of facial pain. With an improved understanding of the role of voltage-gated sodium channels in trigeminal neuralgia, Dr. Sekula anticipates a faster time to improved drug therapies.

Nilkantha Sen is researching ways to understand the molecular foundation of TBI-mediated cognitive impairment. Edward Dixon is studying synaptic dysfunction in TBI and participates in a multi-center drug trial consortium for TBI. Ian Pollack is conducting trials with innovative immunotherapy approaches for children with high-risk, newly diagnosed brain
tumors. Sameer Agnihotri is developing genomic technologies to accelerate patient trials. Gary Kohanbash is studying ways to harness a patient’s own immune cells to fight deadly brain tumors. Nduka Amankulor is harnessing genetic differences in malignant brain tumors to develop new therapies. Paola Grandi is developing oncolytic viruses to selectively target brain tumors.

Mark Richardson is participating in a gene therapy clinical trial for Parkinson’s disease that could potentially lead to the first FDA approval for this therapeutic strategy in the human brain. His intracranial neurophysiology studies of speech production in DBS patients may lead to novel therapeutic strategies to correct speech disorders that involve the basal ganglia. His NIMH R61 clinical trial proposal to use sensing-enabled DBS to treat late-life depression, currently under review, could redefine the field of DBS for neuropsychiatric indications.

Frank Yeh’s research focuses on large-scale analyses of diffusion MRI to explore its promising applications in biomedical research as an imaging biomarker of neuropathology. Avniel Ghuman’s research involves using direct neural recordings and electrical stimulation to decode and modulate social and affective perception, which lays the groundwork for brain stimulation-based treatments of social and affective perception disorders, such as in autism, PTSD and schizophrenia. My own laboratory is working on furthering our understanding of the role of mitochondria in neurological disease with the aim of developing novel therapeutic agents. I am also so proud of the fact that five clinically active neurosurgeons hold significant federal grants.

The University of Pittsburgh Department of Neurological Surgery has a proud history that dates back to 1936 when Stuart Niles Rowe began his career here. A hallmark of Rowe’s teaching philosophy was to advance the critical clinical decision making skills needed for properly treating patients, not just the simple instruction of surgical techniques. He taught thorough clinical and literature review to help pursue an optimal result, and to help lay a foundation for others to follow.

As stewards of Dr. Rowe’s philosophy and Dr. Jannetta’s and Dr. Lunsford’s spirit of innovation, we continue to strive to not only provide the best patient care, but also to advance neurosurgical care, research and education, for this generation, and for all generations to come.

Robert M. Friedlander, MD
Chairman, Professor of Neurological Surgery
Walter E. Dandy Professor of Neurological Surgery
Sites of Service
• UPMC Hospitals:
  Children’s Hospital of Pittsburgh of UPMC
  Magee-Womens Hospital of UPMC
  UPMC Altoona
  UPMC East
  UPMC Hamot
  UPMC Horizon
  UPMC McKeesport
  UPMC Mercy*
  UPMC Northwest
  UPMC Passavant
  UPMC Presbyterian*
  UPMC St. Margaret
  UPMC Shadyside
  * Level 1 trauma facility

• Non-UPMC Hospitals:
  Armstrong
  Excela Health System (Latrobe Area & Westmoreland Regional Hospitals)
  Indiana Hospital
  Monongahela Valley Hospital
  Trinity
  VA Pittsburgh Healthcare System

• Outpatient Offices:
  Seven (fully staffed sites; 20 time share sites covering western Pennsylvania)

Residency
• Three to four chief residents matriculate annually.

Major Service Lines
Community based general neurosurgery
Complex instrumented spine including scoliosis
Endoneurovascular interventional radiology
Epilepsy & movement disorders
Human neural prosthetics program
Image-guided neurosurgery (frame based, frameless, intraoperative CT scan)
Neurophysiology intraoperative monitoring
Pain management
Pediatric neurosurgery
Skull base lesions; endoscopic endonasal approach
Surgical neuro-oncology
Stereotactic radiosurgery

PSD Clinical Productivity (fy 2017)
  Major Procedures: 7,622
  Total Charge Volume: 97,670
  Work RVUs: 346,625

UPP Research Productivity (fy 2017)
  Directs: $9,234,427
  Indirects: $2,699,832
  Grant Projects: 118

UPP Financial Productivity (fy 2017)
  Gross charges: $94,881,690
  Net patient revenue: $21,232,510
  Collection percentage: 22.38%
  Net days in AR: 33.5
  AR > 90 days (%): 15.89%
### Surgical Services by Hospital

*2016-17 Major Procedures (n=7,622)*

- Presbyterian: 58.3%
- Shadyside: 11.8%
- Mon Valley: 0.7%
- McKeensport: 0.2%
- Mercy: 12.7%
- Passavant: 0.5%
- Magee: 0.3%
- Children’s: 6.8%
- VA: 3.0%
- East: 0.7%
- Latrobe: 3.7%
- Hamot: 1.3%
- Altoona: 1.8%
- Northwest: 3.7%
- South Side: 3.7%
- Total < 0.1%

### Surgical Services by Procedure Type

*2016-17 Major Procedures (n=7,622)*

- Spine: 30.8%
- Peripheral Nerve: 1.7%
- CSF Diversion: 5.8%
- Functional: 9.3%
- Crani/Vascular: 1.1%
- Crani/Tumor: 7.5%
- Crani/Trauma: 6.7%
- Crani/Pain: 3.9%
- Endonasal: 3.3%
- Endovascular: 16.6%
- Radiosurgery: 11.8%
- Extracranial Vasc: 0.7%
- Crani/Epilepsy: 0.7%
Faculty, Residents and Visitors
Faculty, Residents and Visitors

Faculty

Full-Time Faculty

• Chairman and Professor:
  Robert M. Friedlander, MD, MA

• Professors:
  C. Edward Dixon, PhD
  (Vice Chairman, Research)
  Peter C. Gerszten, MD, MPH
  (Vice Chairman, Quality Improvement)
  L. Dade Lunsford, MD
  John J. Moossy, MD
  Ajay Niranjan
  David O. Okonkwo, MD, PhD
  (Executive Vice Chairman, Clinic Operations)
  Ian F. Pollack, MD
  (Vice Chairman, Academic Affairs)
  Mingui Sun, PhD

• Associate Professors:
  Jeffrey Balzer, PhD
  Donald J. Crammond, PhD
  Johnathan Engh, MD
  Juan C. Fernandez-Miranda, MD
  Paul A. Gardner, MD
  (Executive Vice Chairman, Surgical Services)
  D. Kojo Hamilton, MD
  Adam S. Kanter, MD
  Raymond Sekula Jr, MD, MBA
  Nilkantha Sen, PhD

• Assistant Professors:
  Sameer Agnihotri, PhD
  Nduka Amankulor, MD
  Diane L. Carlisle, PhD
  Avniel Ghuman, PhD
  Paola Grandi, PhD
  Stephanie Greene, MD
  Bradley Gross, MD
  Luke Henry, PhD
  Brian Jankowitz, MD
  Gary Kohanbash, MD
  Edward A. Monaco III, MD, PhD
  Ava Puccio, PhD, RN
  Mandeep Tamber, MD, PhD
  Fang-Cheng (Frank) Yeh, MD, PhD

• Clinical Professors:
  Adnan A. Abla, MD
  (Retired effective March 2017)
  Matt El-Kadi, MD, PhD
  (Vice Chairman, UPMC Passavant)
  Joseph C. Maroon, MD
  (Vice Chairman, UPMC Community Medicine)
  Daniel A. Wecht, MD, MSc
  David S. Zorub, MD

Faculty and residents at 2017 resident graduation dinner held at Pittsburgh Golf Club on June 17, 2017.
Faculty, Residents and Visitors

Faculty

• Clinical Professor Emeritus:
  Peter Sheptak, MD

• Clinical Associate Professor:
  Michael J. Rutigliano, MD, MBA

• Clinical Assistant Professors:
  J. Brad Bellotte, MD
  Daniel M. Bursick, MD
  David L. Kaufmann, MD
  Vincent J. Miele, MD
  Monte B. Weinberger, MD

• Research Associate Professor:
  Hideyuki Kano, MD, PhD

• Research Assistant Professors:
  Yue-Fang Chang, PhD
  Wendy Fellows-Mayle, PhD
  Esther Jane, PhD
  Wenyan Jia, PhD
  Daniel Premkumar, PhD
  Tanusree Sen, PhD
  Hong Qu Yan, MD, PhD
  (Retired effective April 2017)

• Clinical Instructors:
  Jeff Bost, PA-C
  Erin Paschel, PA-C

Joint Appointments in Neurological Surgery
Clifford Brubaker, MD
  (Health Rehab Services)
William Fielding Donaldson, MD
  (Orthopedic Surgery)
John C. Flickinger, MD
  (Radiation Oncology)
Ferenc E. Gyulai, MD
  (Anesthesiology)
Barry E. Hirsh, MD
  (Otolaryngology)
Tudor G. Jovin, MD
  (Neurology)
Steven L. Kanter, MD
  (Senior Associate Dean, Medicine)
Mark R. Lovell, MD
  (Orthopedic Surgery)
Rosa Lynn B. Pinkus, PhD
  (Medicine)
Margaret Reidy, MD
  (Physical Medicine and Rehabilitation)

Adjunct Faculty
James Burke, MD
Dallas Hack, MD
Paul David Nussbaum, PhD
Hideho Okada, MD, PhD

UPMC Hamot
Efkan Colpan, MD
Elio Demeira, MD
William Diefenbach, MD
Isam Khoja, MD
**Faculty, Residents and Visitors**

*Residents*

**Chief Residents**
Christopher Deibert, MD  
Medical School: Pittsburgh  
Undergraduate School: Goucher College  
Hometown: Pottsville, Pa.

Zachary Tempel, MD  
Medical School: Indiana  
Undergraduate School: Miami  
Hometown: Indianapolis, Ind.

Nathan Zwagerman, MD  
Medical School: Wayne State  
Undergraduate School: Calvin College  

**PGY-6**
Gurpreet S. Gandhoke, MD  
Medical School: NDMVP Samaj’s Medical College  
Undergraduate: University of Pune  
Hometown: Pune, India

Phillip Lee, MD, PhD  
Medical School: Pittsburgh  
Undergraduate School: George Washington  
Hometown: Kingsport, Tenn.

**PGY-5**
David Panczykowski, MD  
Medical School: Miami  
Undergraduate School: Clemson  
Hometown: Colorado Springs, Colo.

Gregory Weiner, MD  
Medical School: Tulane  
Undergraduate School: California, Berkeley  
Hometown: Los Angeles, Calif.

Georgios Zenonos, MD  
Medical School: Athens  
Undergraduate School: N/A  
Hometown: Pafos, Cyprus

William Ares, MD  
Medical School: Vermont  
Undergraduate School: Johns Hopkins  
Hometown: Malverne, N.Y.

Stephen A. Johnson, MD  
Medical School: Penn  
Undergraduate School: Penn  
Hometown: Spring Lake, N.J.
Faculty, Residents and Visitors

Residents

W. Christopher Newman, MD
Medical School: Florida
Undergraduate School: Harvard
Hometown: Longwood, Fla.

Christian B. Ricks, MD
Medical School: Baylor
Undergraduate School: Brigham Young
Hometown: Scarsdale, N.Y.

PGY-4
Amir H. Faraji, MD, PhD
Medical School: Pittsburgh
Undergraduate School: Florida
Hometown: Clearwater, Fla.

Ezequiel Goldschmidt, MD, PhD
Medical School: Buenos Aires University
Undergraduate School: Buenos Aires University
Hometown: Buenos Aires, Argentina

David J. Salvetti, MD
Medical School: Virginia
Undergraduate School: Vanderbilt

Benjamin M. Zussman, MD
Medical School: Jefferson Medical College
Undergraduate School: Haverford
Hometown: Pittsburgh, Pa.

PGY-3
Nitin Agarwal, MD
Medical School: Rutgers
Undergraduate School: College of New Jersey
Hometown: Flemington, N.J.

Michael McDowell, MD
Medical School: Columbia
Undergraduate School: Arizona State

Jeremy Stone, MD
Medical School: Hawaii
Undergraduate School: Case Western Reserve
Hometown: Kaneohe, Hawaii

Daniel Tonetti, MD
Medical School: Pittsburgh
Undergraduate School: Drexel
Hometown: Keedysville, Md.

PGY-2
Nima Alan, MD
Medical School: Case Western
Undergraduate School: British Columbia
Hometown: Vancouver, B.C.

Enyinna Nwachuku, MD
Med School: Pittsburgh
Undergraduate School: Pittsburgh

Alp Ozinpar, MD
Medical School: Oregon
Undergraduate School: California
Hometown: Istanbul, Turkey

Matthew Pease, MD
Medical School: Keck/USC
Undergraduate School: Duke

PGY-1
Hanna Algattas, MD
Medical School: Rochester
Undergraduate School: Colgate
Hometown: Syracuse, N.Y.

Edward Andrews, MD
Med School: Thomas Jefferson
Undergraduate School: Pennsylvania

Kamil Nowicki, MD, PhD
Medical School: Florida
Undergraduate School: Florida
Hometown: Gainesville, Fla.

Xiaoran Zhang, MD
Medical School: Pittsburgh
Undergraduate School: UCLA
Hometown: Luoyang, China
Each year the department hosts the Stuart Rowe Society Lectureship and Research Day, a special day intended to showcase research activities in the field of neurological surgery.

The day is held in honor of Stuart Niles Rowe, widely considered the founding figure of neurosurgery training in Pittsburgh. In 1936, Rowe established the base of what would later become the University of Pittsburgh Department of Neurological Surgery.

During this special day, a series of talks are presented by department residents, each spotlighting a topical research issue relevant in the field of neurosurgery. These talks are followed by discussion, moderated by a prominent visiting professor. The 2016 honored guest was Andres Lozano, MD, PhD, of the University of Toronto.

2016 Stuart Rowe Lecturer

Andres Lozano, MD, PhD
Dan Family Chair in Neurosurgery
RR Tasker Chair in Functional Neurosurgery
University of Toronto

Past Stuart Rowe Lecturers

2015
Robert E. Harbaugh, MD
Milton S. Hershey Medical Center

2014
Robert L. Martuza, MD
Harvard Medical School

2013
Chris Shaffrey, MD
University of Virginia

2012
James Rutka, MD
University of Toronto

2011
Henry Brem, MD
Johns Hopkins University

2010
Ralph G. Dacey, Jr., MD
Washington University

2009
Edward H. Oldfield, MD
University of Virginia

2008
Patrick J. Kelly, MD
New York University

2007
John A. Jane, Sr, MD, PhD
University of Virginia

2006
M. Sean Grady, MD
University of Pennsylvania

2005
Gary Steinberg, MD, PhD
Stanford University
Faculty, Residents and Visitors

Visiting Scholars & Observers

Ruslan Aksyonov, MD
Visiting Observer
Cranial Base Surgery
Romodanov Institute of Neurosurgery
Kiev, Ukraine
(May 1-9, 2017)

Jiwei Bai, MD, PhD
Visiting Observer
Cranial Base Surgery
Capital Medical University/Beijing Tiantan Hospital
Beijing, China
(July 11 - September 23, 2016)

Joao Tiago Alves Belo, MD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Hospital Felicio Rocho
Belo Horizonte, Brazil
(May 1, 2017 - April 30, 2018)

Hamid Borghei-Razavi, MD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Munster University/Clemens Hospital
Munster, Germany
(May 1, 2016 - April 30, 2017)

David Fernandes Cabral, MD
Visiting Research Fellow
Fiber Tractography Lab
Caracas, Venezuela
(April 1, 2015 - June 30, 2017)

Emrah Celtikci, MD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Yildirim Beyazit University Yenimahalle Training & Research Hospital
Ankara, Turkey
(April 1, 2016 - March 3, 2017)

Pinar Celtikci, MD
Visiting Research Fellow
Fiber Tractography Lab
Diskapi Yildirim Beyazit Training & Research Hospital
Ankara, Turkey
(April 1, 2016 - March 3, 2017)

Salomon Cohen, MD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Instituto Nacional de Neurologia y Neurocirugia Manuel Velasco Suarez
Mexico City, Mexico
(May 16, 2017 - April 30, 2018)

Tomasz Dziedzic, MD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Medical University of Warsaw
Warsaw, Poland
(April 1 - September 23, 2016)

Kanna Gnanalingham, MBBS
Visiting Observer
Cranial Base Surgery
Salford Royal Foundation Trust
Salford, United Kingdom
(December 5-6, 2016)

Daipayan Guha, MD
Spine Fellow Candidate
Spine Services Division
University of Toronto
Toronto, Ontario
(May 9, 2017)

Hemn Abdulrahim Hasan, MBChB
Visiting Observer
Cranial Base Surgery
Erbil Teaching Hospital
Erbil, Iraq
(September 1 - November 4, 2016)

Vanessa Hernandez Hernandez, MD
Visiting Observer
Cranial Base Surgery
Hospital Universitario de Canarias
Tenerife, Spain
(September 6 - October 28, 2016)
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Department</th>
<th>Institution</th>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer Hodurek-Diez, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Universitätsklinikum St. Polten</td>
<td>St. Polten, Austria</td>
<td>June 19-30, 2017</td>
</tr>
<tr>
<td>Changchen Hu, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Shanxi Medical University/The Affiliated</td>
<td>Tai-Yuan, China</td>
<td>October 1 - December 31, 2016</td>
</tr>
<tr>
<td>Atte Karppinen, MD, PhD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Helsinki University Hospital</td>
<td>Helsinki, Finland</td>
<td>August 23-31, 2016</td>
</tr>
<tr>
<td>Lai Fung Li, MBBS</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Federal University of Uberlandia/Santa</td>
<td>Uberlandia, Brazil</td>
<td>June 27 - July 8, 2016</td>
</tr>
<tr>
<td>Stefan Lieber, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>University Hospital Zurich</td>
<td>Zurich, Switzerland</td>
<td>April 23, 2015 - January 28, 2017</td>
</tr>
<tr>
<td>Jiang Liu, MD, PhD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>China-Japan Friendship Hospital</td>
<td>Beijing, China</td>
<td>May 24 - August 3, 2016</td>
</tr>
<tr>
<td>Hector Martin Maldonado, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Ramos Mejia General Hospital</td>
<td>Buenos Aires, Argentina</td>
<td>January 18 - June 14, 2017</td>
</tr>
<tr>
<td>Yanire Sanchez Medina, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Hospital Universitario Nuestra Senora de la Candelaria</td>
<td>Tenerife, Spain</td>
<td>March 13 - April 27, 2017</td>
</tr>
<tr>
<td>Aldo Eguiliz Melendez, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Instituto Nacional de Neurologia y Neurocirugia</td>
<td>Mexico City, Mexico</td>
<td>November 1 - December 27, 2016</td>
</tr>
<tr>
<td>Harry M. Mushlin, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>University of Maryland, School of Medicine</td>
<td>Baltimore, Md.</td>
<td>April 11, 2017</td>
</tr>
<tr>
<td>Edinson Najera, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Hospital Joan XXII</td>
<td>Bilbao, Spain</td>
<td>September 1, 2016 - August 31, 2017</td>
</tr>
<tr>
<td>Ana Nakassa, MD</td>
<td>Visiting Clinical Research Fellow</td>
<td>Cranial Base Surgery</td>
<td>IMSETRO Maring, Brazil</td>
<td>August 31, 2015 - September 2, 2017</td>
<td></td>
</tr>
<tr>
<td>Harisha P. Narasimhamurthy, MCh</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Vikram Hospital</td>
<td>Bangalore, India</td>
<td>October 17-28, 2016</td>
</tr>
</tbody>
</table>
### Faculty, Residents and Visitors

*Visiting Scholars & Observers*

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
<th>Location</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mehdi Nikobakht, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Tehran University/Firoozgar Hospital, Tehran, Iran</td>
<td>July 1, 2016 - August 4, 2016</td>
</tr>
<tr>
<td>Cristian Ferrareze Nunes, MD, MSc</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Internneuro, Rio de Janeiro, Brazil</td>
<td>March 1 - August 26, 2016</td>
</tr>
<tr>
<td>Dmytro Okonskyi, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Romodanov Institute of Neurosurgery, Kiev, Ukraine</td>
<td>May 1-9, 2017</td>
</tr>
<tr>
<td>Robert Zanabria Ortiz, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Hospital General Universitario de Ciudad Real, Real, Spain</td>
<td>June 1 - November 30, 2016</td>
</tr>
<tr>
<td>Noemi Lomillos Prieto, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>University Hospital of Getafe, Madrid, Spain</td>
<td>March 1 - April 27, 2017</td>
</tr>
<tr>
<td>Javier M. Saavedra, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Universidad del Rosario, Bogota, Colombia</td>
<td>February 1 - March 31, 2017</td>
</tr>
<tr>
<td>Xicai Sun, MD, PhD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Eye &amp; ENT Hospital of Fudan University, Shanghai, China</td>
<td>March 10, 2016 - August 31, 2017</td>
</tr>
<tr>
<td>Dmytro Teslenko, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Romodanov Institute of Neurosurgery, Kiev, Ukraine</td>
<td>May 1-9, 2017</td>
</tr>
<tr>
<td>Huy Truong, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>International Neurosurgery Hospital, Ho Chi Minh, Vietnam</td>
<td>November 16, 2015 - June 30, 2018</td>
</tr>
<tr>
<td>Yupeng Wu, MD</td>
<td>Visiting Research Fellow</td>
<td>Fiber Tractography Lab</td>
<td>First Hospital, China Medical University, Shenyang, China</td>
<td>September 8, 2016 - February 10, 2017</td>
</tr>
<tr>
<td>Wenping Xiong, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>The Central Hospital of Yichang City, Yichang, China</td>
<td>May 1-29, 2017</td>
</tr>
<tr>
<td>Bo Yan, MD</td>
<td>Visiting Research Fellow</td>
<td>Surgical Neuroanatomy Lab/Cranial Base Surgery</td>
<td>Xuanwu Hospital/Capital Medical University, Beijing, China</td>
<td>April 19, 2016 - March 27, 2017</td>
</tr>
<tr>
<td>Gang Yang, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>First Affiliated Hospital, Chongqing Medical University, Chongqing, China</td>
<td>January 1 - March 31, 2017</td>
</tr>
<tr>
<td>Kun Yang, MD</td>
<td>Visiting Observer</td>
<td>Cranial Base Surgery</td>
<td>Nanjing Brain Hospital, Nanjing, China</td>
<td>April 3-14, 2017</td>
</tr>
</tbody>
</table>
Faculty, Residents and Visitors
Visiting Scholars & Observers

Hesham Zakaria, MD
Visiting Observer
Spine Services Division
Henry Ford Health System
Detroit, Mich.
(June 20, 2017)

Idoya Zazpe, MD, PhD
Visiting Observer
Cranial Base Surgery
Hospital of Navarre
Pamplona, Spain
(August 1 - August 23, 2016)

Jian Zhang, MD, PhD
Visiting Observer
Cranial Base Surgery
First Affiliated Hospital, Soochow University
Suzhou, China
(April 26 - May 26, 2017)

Peizhi Zhou, MD, PhD
Visiting Research Fellow
Surgical Neuroanatomy Lab/Cranial Base Surgery
Sichuan University/West China Hospital
Chengdu, China
(May 1, 2017 - April 30, 2018)
Principles & Practice of
Gamma Knife Radiosurgery

• July 11-15, 2016:
  Wondesen Gebreamlak, PhD, Columbia, S.C.
  Mark Bryniarski, MD, Albuquerque N.M.
  Nathan C. Rowland, MD, PhD, Charleston, S.C.
  Raphael Sacho, MD, Milwaukee, Wis.
  Liza J. Stapleford, MD, Atlanta, Ga.
  Emrah Celtikei, MD, UPMC
  Trinh Cong Vuong, MD, Vietnam
  Nguyen Minh Tu, MSc, Vietnam
  Nguyen Thanh Binh, MD, Vietnam
  Jared Treas, MSc, Mechanicsburg, Pa.
  D. Kyle Kim, MD, Mercer Island, Wash.
  Hendrik Klopper, MD, Sioux Falls, S.D.
  Rebekah Young, MD, Columbus, Ohio
  Fang Fang, MD, China
  Ashraf Youssef, MD, Mechanicsburg, Pa.
  Jonas Sheehan, MD, Camp Hill, Pa.
  Amy Bornholdt, MSc, Hershey, Pa.
  Peter Andrew Goyer, MSc, Lewistown, Pa.
  Michele Ferenci, PhD, Hershey, Pa.
  Leonard Tuanquin, MD, Hershey, Pa.

• September 19-23, 2016:
  Biral Amin, MD, Newport News, Va.
  Michael Puumala, MD, Sioux Falls, S.D.
  Thomas Gergel, MD, Danville, Pa.
  Mark J. Dannenbaum, MD, Houston, Texas
  Debra Nana Yeboa, MD, Houston, Texas
  Jagdish Patel, MD, Indianapolis, Ind.
  Jeffrey R. Albea, MD, Knoxville, Tenn.
  Kurt D. Meyer, MD, Columbia, S.C.
  John H. Giesler, MD, Stockbridge, Ga.
  Osama Khan, MD, Warrenville, Ill.
  Greg Fellows, MD, United Kingdom
  Matt Giles, MSc, Atlanta, Ga.
  Eric Mellon, MD, Miami, Fla.
  Christopher Tien, PhD, New Haven, Conn.
  Zhonglu Wang, PhD, Hershey, Pa.
  Steven A. Tom, MD, Danville, Pa.
  Zhifei Wen, PhD, Houston, Texas
  Tina Marie Briere, PhD, Houston, Texas

• November 7-11, 2016:
  Dimitrios Paraskevopoulos, MD, London
  Frank Michaelis, MD, South Africa
  Jack Mallah, PhD, Columbia, S.C.
  Jason Brant, MD, Philadelphia, Pa.
  Charles Eric Wooten, MD, Columbia, S.C.
  Gerben Borst, MD, PhD, Amsterdam
  William Dunn, MD, Peoria, Ill.
  Miao Zhang, PhD, New Brunswick, N.J.
  Cristin Kennedy, RN Warrenville, Ill.
  Adele Poole, Tech, South Africa
  Colbert Ditsepu, MS, South Africa
  Lee Stunja, MSc, Hershey, Pa.
  Julius O. Ebinu, MD, PhD, New York, N.Y.
  Sagar C. Patel, MD, Marshfield, Wis.
  Diane Ling, MD, UPMC
  Meric Sengo, MD, Istanbul, Turkey
  Jon Isaacson, MD, Hummelstown, Pa.
  Aftab Khan, MD, Kuwait
  Koray Ozdemaran, MD, Instanbul, Turkey
  Andy Xu, PhD, New York, N.Y.

• January 9-13, 2017:
  Mark Whitaker, MD, Burlington, Vt.
  Jonathan Abelson, MD, Thousand Oak, Calif.
  Loyola V. Gressot, MD, Houston, Texas
  Wim Bouwenk, MD, Amsterdam
  Rhudelyn Rodrigo, RN, New Brunswick, N.J.
  Michael Levitt, MD, Seattle, Wash.
  Tatiana Conrad, MD, Canada
  Dinoshan chetty, MChB, South Africa
  Hamid Borgei-Razavi, MD, PhD, UPMC
  Xicai Sun, MD, UPMC
  Bo Yan, MD, UPMC
  Margaret Riordan, MD, Wilkes Barre, Pa.
  Christopher Schutt, MD, Farmington Hills, MI
  Aviva Abosch, MD, PhD, Aurora, Colo.
  Ke Nie, PhD, New Brunswick, N.J.
  Julie Lo, MSc, Paramus, N.J.
  Ki-Chuen Chak, PhD, Paramus, N.J.

• March 13-17, 2017:
  Kyle Uittenbogaard, MD, Minneapolis, Minn.
  Shawn Michael Stevens, MD, Cincinnati, Ohio
  Samir Patel, MD, Canada
  Keith Aronyk, MD, Canada
  Chunli Yang, PhD, Jackson, Miss.
  Srinivasan Vijayarukumar, MD, Jackson, Miss.
  Tomoyoshi Ota, MD, Japan
  Masaru Miura, RT, Japan
  Beth N. McNulty, MD, Lexington, Ky.
  Joel St. Aubin, PhD, Canada
  James C. Barrese, MD, Camden, N.J.
  Frank B. Persson, MD, South Africa
  Ece Tek, MSc, Instanbul, Turkey
  Feridun Acar, MD, Instanbul, Turkey
  Christopher Schultz, MD, Milwaukee, Wis.
  Joseph Bovi, MD, Milwaukee, Wis.
  Katherine Albano, MSc, Milwaukee, Wis.
Faculty, Residents and Visitors

Course Participants

- May 8-12, 2017
  - Henry Park, MD, New Haven, Conn.
  - Paul Grabb, MD, Kansas City, Mo.
  - Jason A. Ellis, MD, Atlanta, Ga.
  - Christian Bowers, MD, Seattle, Wash.
  - Gwynyvere Parrish, RN, Portland, Ore.
  - Edward Dickerson, MSc, Kansas City, Mo.
  - Andrew Ju, MD, Greenville, N.C.
  - Anthony J. Paravati, MD, Kettering, Ohio
  - Vijay Kudithipudi, MD, Kettering, Ohio
  - Aya Nakamura, MD, Tokyo
  - Ronny Kalash, MD, UPMC
  - Robert Prosnitz, MD, Allentown, Pa.
  - John Niemkiewicz, PhD, Allentown, Pa.
  - John M. Sheldon, MD, Kansas City, Mo.
  - Robert Gilliam, MSc, Kansas City, Mo.
  - Kristi Hendrickson, PhD, Seattle, Wash.
  - Lia Halasz, MD, Seattle, Wash.
  - Mark Phillips, PhD, Seattle, Wash.
  - Jason K. Rockhill, MD, PhD, Seattle, Wash.

Comprehensive Endoscopic Surgery of the Skull Base Course

- December 7-10, 2016:
  - Andres Almendral, Panama
  - Raj Bhalla, Wilmslow, Cheshire, UK
  - Amit Bhojwani, Stratford, N.J.
  - Angela Bohnen, Chicago, Ill.
  - Lorimer Sandoval Carneiro, Goiania, Brazil
  - Mauricio Chalup Sr., Buenos Aires, Argentina
  - Longyi Chen, Chengdu, Sichuan, China
  - Hung Wai Cho, Hong Kong
  - Amelia Clark, Stanford, Calif.
  - Aldo Gabriel Eguiluz-Melendez, Mexico City, Mexico
  - Caleb Feliciano, San Juan, P.R.
  - Marco Fornazieri, Londrina, Parana, Brazil
  - Kanna Gnanalingham, Salford, UK
  - Nandini Govil, Pittsburgh, Pa.
  - Mario Grenald, San Pablo Viejo, Panama
  - Luke Hnenny, Regina, Canada
  - Jennifer A. Hodurek-Diez, St. Polten, Austria
  - Phillip Huyett, Pittsburgh, Pa.
  - Christopher Ito, Augusta, Ga.
  - Wang Jia, Beijing, China
  - Michael Kelly, Saskatoon, Canada
  - Jonathan King, Lexington, S.C.
  - Elisabeth Kinn, St. Polten, Austria

- May 10-13, 2017:
  - Shaheryar Ansari, Indianapolis, Ind.
  - Carlos Ceballos, Cali, Colombia
  - Jincao Chen, Wuhan, China
  - Hyun Jin Cho, Jinju, Korea
  - Adam DeConde, San Diego, Calif.
  - Kenneth De Los Reyes, Loma Linda, Calif.
  - Javier Fang, Beijing, China
  - David M. Johnson, Pittsburgh, Pa.
  - Pamela Jones, San Diego, Calif.
  - Carla Jung, Heidelberg, Germany
  - Maqsood Ali Khan, Mumbai, India
  - Jong Seung Kim Jr., Jeonju, Korea
  - Pascal Lavergne, Quebec, Canada

- Pablo Ezequiel Landaburu, Buenos Aires, Argentina
- Cheng-Chi Lee, Taoyuan, Taiwan
- Dennis Lip Yen Lee, Hong Kong
- Ya-Jui Lin, Taipei, Taiwan
- Nyall London Jr., Baltimore, Md.
- Andre Matsuda, Londrina, Parana, Brazil
- Guolo Meng, Beijing, China
- Shabir Mia, Saskatoon, Canada
- Roham Moftakhar, Columbia, S.C.
- Ju Hyung Moon, Seoul, Korea
- Adrienne Moraff, Stanford, Calif
- Saint-Aaron Morris, Houston, Texas
- Garani S. Nadaraja, Auckland, Calif.
- Thomas Noh, Detroit, Mich.
- Emilio Santana MX Nunes, Goiania, Brazil
- Yan Qu, Xi’an, China
- Bhaskar Ram, Aberdeen, Scotland
- Richard Rammo, Detroit, Mich.
- Juan Ramos-Acevedo, San Juan, P.R.
- Tae Hoon Roh, Suwon, Gyeong-Gi, Korea
- Anil Roy, Atlanta, Ga.
- Griffin Santarelli, Norfolk, Va.
- Saurabh Sharma, Tucson, Ariz.
- Peter Sun, Oakland, Calif.
- Kutluay Ulluc, Madison, Wisc.
- Vamsidhar Vallamknodu, Aberdeen, Scotland
- Shujun Xu, Jinan, Shandong, China

- Paul Ezequiel Landaburu, Buenos Aires, Argentina
- Dennis Lip Yen Lee, Hong Kong
- Ya-Jui Lin, Taipei, Taiwan
- Nyall London Jr., Baltimore, Md.
- Andre Matsuda, Londrina, Parana, Brazil
- Guolo Meng, Beijing, China
- Shabir Mia, Saskatoon, Canada
- Roham Moftakhar, Columbia, S.C.
- Ju Hyung Moon, Seoul, Korea
- Adrienne Moraff, Stanford, Calif
- Saint-Aaron Morris, Houston, Texas
- Garani S. Nadaraja, Auckland, Calif.
- Thomas Noh, Detroit, Mich.
- Emilio Santana MX Nunes, Goiania, Brazil
- Yan Qu, Xi’an, China
- Bhaskar Ram, Aberdeen, Scotland
- Richard Rammo, Detroit, Mich.
- Juan Ramos-Acevedo, San Juan, P.R.
- Tae Hoon Roh, Suwon, Gyeong-Gi, Korea
- Anil Roy, Atlanta, Ga.
- Griffin Santarelli, Norfolk, Va.
- Saurabh Sharma, Tucson, Ariz.
- Peter Sun, Oakland, Calif.
- Kutluay Ulluc, Madison, Wisc.
- Vamsidhar Vallamknodu, Aberdeen, Scotland
- Shujun Xu, Jinan, Shandong, China

- Pablo Ezequiel Landaburu, Buenos Aires, Argentina
- Dennis Lip Yen Lee, Hong Kong
- Ya-Jui Lin, Taipei, Taiwan
- Nyall London Jr., Baltimore, Md.
- Andre Matsuda, Londrina, Parana, Brazil
- Guolo Meng, Beijing, China
- Shabir Mia, Saskatoon, Canada
- Roham Moftakhar, Columbia, S.C.
- Ju Hyung Moon, Seoul, Korea
- Adrienne Moraff, Stanford, Calif
- Saint-Aaron Morris, Houston, Texas
- Garani S. Nadaraja, Auckland, Calif.
- Thomas Noh, Detroit, Mich.
- Emilio Santana MX Nunes, Goiania, Brazil
- Yan Qu, Xi’an, China
- Bhaskar Ram, Aberdeen, Scotland
- Richard Rammo, Detroit, Mich.
- Juan Ramos-Acevedo, San Juan, P.R.
- Tae Hoon Roh, Suwon, Gyeong-Gi, Korea
- Anil Roy, Atlanta, Ga.
- Griffin Santarelli, Norfolk, Va.
- Saurabh Sharma, Tucson, Ariz.
- Peter Sun, Oakland, Calif.
- Kutluay Ulluc, Madison, Wisc.
- Vamsidhar Vallamknodu, Aberdeen, Scotland
- Shujun Xu, Jinan, Shandong, China

- Pablo Ezequiel Landaburu, Buenos Aires, Argentina
- Dennis Lip Yen Lee, Hong Kong
- Ya-Jui Lin, Taipei, Taiwan
- Nyall London Jr., Baltimore, Md.
- Andre Matsuda, Londrina, Parana, Brazil
- Guolo Meng, Beijing, China
- Shabir Mia, Saskatoon, Canada
- Roham Moftakhar, Columbia, S.C.
- Ju Hyung Moon, Seoul, Korea
- Adrienne Moraff, Stanford, Calif
- Saint-Aaron Morris, Houston, Texas
- Garani S. Nadaraja, Auckland, Calif.
- Thomas Noh, Detroit, Mich.
- Emilio Santana MX Nunes, Goiania, Brazil
- Yan Qu, Xi’an, China
- Bhaskar Ram, Aberdeen, Scotland
- Richard Rammo, Detroit, Mich.
- Juan Ramos-Acevedo, San Juan, P.R.
- Tae Hoon Roh, Suwon, Gyeong-Gi, Korea
- Anil Roy, Atlanta, Ga.
- Griffin Santarelli, Norfolk, Va.
- Saurabh Sharma, Tucson, Ariz.
- Peter Sun, Oakland, Calif.
- Kutluay Ulluc, Madison, Wisc.
- Vamsidhar Vallamknodu, Aberdeen, Scotland
- Shujun Xu, Jinan, Shandong, China
Faculty, Residents and Visitors

Course Participants

Gaudencio Ligutom III, Zamboanga, Philippines
Armando Lorenzo Jr., Zamboanga, Philippines
Marco Marsella, Phoenix, Ariz.
Kotoo Meguro, Saskatoon, Canada
Louise Melia, Glasgow, Scotland
Jennifer Moy, Pittsburgh, Pa.
Rajesh Nair, Kerala, India
Yuya Nishiyama, Toyoake, Japan
Ali Niyaf, Male, Maldives
Prashant Pawar, Mumbai, India
Uri Peleg, Ha’ar, Israel
Giordano Queiros Sr., Goiania, Brazil
Narow Ravshanbek, Tashkent, Uzbekistan
Ming Ren, Beijing, China
Camillo Reyes, Augusta, Ga.
Lee Marvin Reyes Nunez, Masaya, Nicaragua
Nicholas Rowan, Pittsburgh, Pa.
Luis Fernando Santacruz Florez, Santiago, Colombia
Kristin Seiberling, Loma Linda, Calif.
Xiaohong Song, Beijing, China
Simon Thiago Souza Lara Leao, Goiania, Brazil
Matthew Speyer, Nashville, Tenn.
Mark Stern, Escondido, Calif.
Aleksander Vitali, Saskatoon, Canada
Kuiji Wang, Beijing, China
Todd Wannemuehler, Indianapolis, Ind.
Yongxiang Wei, Beijing, China
Anna Wertz, Detroit, Mich.
Johnny Wong, Stanford, Calif.
Klaus Zweckberger, Heidelberg, Germany
Chirag Patel, Maywood, Ill.
Spencer Payne, Charlottesville, Va.
Jim Reidy, Gilbert, Ariz.
Hector Pablo Rojas, Rosario, Argentina
Michael Sabalza, Manila, Phillipines
Nathan Sautter, Portland, Ore.
Sergey Spektor, Jerusalem, Israel
Alex Stewart, San Diego, Calif.
Jonathan Ting, Indianapolis, Ind.
Raymond Tsang, Hong Kong
Idoya Zazpe, Pamplona, Spain
Koro Zubimendi, Pamplona, Spain

Advanced Endoscopic Surgery of the Skull Base Course

• August 18-20, 2016:
Ovanes Akobyan, St. Petersburg, Russia
Justin Cetas, Portland, Ore.
Aaron Cohen-Gadol, Indianapolis, Ind.
Ron Elishar, Jerusalem, Israel
Anand Germanwala, Maywood, Ill.
Jose Gurrola II, Charlottesville, Va.
Edward Hepworth, Denver, Colo.
John Jane Jr., Charlottesville, Va.
Peter Jarin, Pasig, Philipines
Pablo Jose, Rosario, Argentina
Atte Karppinen, Helsinki, Finland
Leena Kivielpo, Helsinki, Finland
Arnett Klugh III, San Diego, Calif.
Gilberto Leung, Hong Kong
Marco Marsella, Phoenix, Ariz.
Itay Melamed, Denver, Colo.
Bakhtiyar Pashaev, Kazan, Russia
History

Neurological surgery in Pittsburgh began in 1936 with the arrival of Stuart Niles Rowe, MD, a promising young surgeon trained under the auspices of Charles M. Frazier in Philadelphia. Rowe’s arrival marked the birth of a dedicated neurosurgical division that would become a leader in the field. His move here was prompted by a letter from L.H. Landon, Sr., MD, the chief of general surgery at West Penn Hospital, emphasizing the need for a formally trained neurosurgeon in Pittsburgh. It is said that Rowe won a coin toss over William J. Gardner for the opportunity to migrate to the Pittsburgh area and set up practice. Gardner subsequently moved to the Cleveland area and developed his own neurosurgical center.

Rowe, a Michigan native, developed a strong clinical practice based on the loosely affiliated community hospitals in the Pittsburgh area. He focused his research activities at the University of Pittsburgh and wrote several pioneering papers on the neurosurgical treatment of pain, brain abscess and cerebral trauma. An avid sportsman and devoted father, he dedicated at least one day a week to physical fitness and family life. Rowe began the first formal residency program at West Penn Hospital in 1949 and consolidated this program at Presbyterian University Hospital within the University of Pittsburgh in 1952. Another program was also established at Mercy Hospital in 1949 under the direction of Floyd Bragden, MD, who arrived in Pittsburgh three years after Rowe. Dr. Bragden, trained by Jefferson Browder at Kings County Hospital in New York, was a Pittsburgh native and a well-known acoustic tumor surgeon.

The first woman to practice neurosurgery in the area was Dorothy Klinke Nash, MD. Having completed training in both neurology and neurosurgery at Bellevue Hospital under the guidance of Byron Stookey in the late 1920s, Nash moved to the Pittsburgh area in 1936 but did not gain hospital appointment until a chance meeting with Morris Abel Slocum, MD, the chief of general surgery at St. Margaret Hospital. At the time, Nash worked at the blood bank. While drawing Slocum’s blood, he determined Nash’s background in neurosurgery and immediately appointed her to a staff position. This appointment was a landmark in that she became the first woman to practice neurosurgery in the United States and, thereby, pioneered the way for other women in the field. Shortly thereafter, she was appointed to the hospital staff at the university under Rowe. A graduate of Bryn Mawr College and the Columbia College of Physicians and Surgeons, Nash was named Pennsylvania Woman of the Year in 1957.

Rowe volunteered for military service in World War II, served as an Army lieutenant colonel, and treated casualties triaged to a southern England military hospital. Upon return to Pittsburgh at the end of the war, he resumed control of the neurosurgery service at the university, which was then a division of General Surgery. Rowe embarked on a mission to unify the service, which performed operations at many local hospitals. He also began to train residents.

His own training firmly based in academic neurosurgery, Rowe sought to acquire residents with a commitment to research, teaching and independent thought. The conference schedule included joint conferences with the Mercy Hospital neurosurgical program and a monthly journal club that convened after a dinner at Rowe’s home.

Anthony Fredrick Susen, MD, joined the university in 1953 as a clinical instructor after completing his training at both Bowman Gray Medical School and Harvard. The Illinois native graduated from Dartmouth College and Harvard Medical School. Susen held the same belief as Rowe: that residency training programs should be designed to teach not only exceptional surgical technique, but also the critical clinical decision-making skills. Susen supported Rowe’s beliefs in training residents and emphasized the need for thorough literature review and independent research as a means of broadening clinical knowledge.
Rowe and Susen worked together into the 1960s. In 1964, Henry Bahnson, MD, the chair of General Surgery, appointed Sidney Goldring, MD, of St. Louis to be the first chief of the Division of Neurological Surgery. After two years, Dr. Goldring returned to St. Louis as a professor of neurosurgery and subsequently was named chairman at Washington University. In 1966, Susen was named acting chief and, under his direction, other facilities including Children’s Hospital and the Veterans Administration Medical Center, became part of the service.

In 1971, Peter Joseph Jannetta, MD, was appointed professor and chairman of the newly formed Department of Neurological Surgery and served in the post for 25 years. Dr. Jannetta is universally known for his work in the treatment of cranial nerve disorders, developing a microvascular decompression procedure—widely known as the Jannetta Procedure—that offers trigeminal neuralgia patients an effective therapeutic alternative when medications fail. Although Dr. Jannetta’s scientific and leadership contributions are significant, perhaps his greatest achievement is the legacy of outstanding international leaders he trained in neurosurgery. During his tenure, he trained 49 residents—including four future department chairmen—and was honored with an endowed professorship, appropriately named after Walter E. Dandy—considered one of the founding fathers of neurosurgery. In June of 2000, Dr. Jannetta retired from the University of Pittsburgh and, subsequently, took a position with Allegheny General Hospital.

In 1997, L. Dade Lunsford, MD, was selected as the second department chairman. In the ensuing decade, Dr. Lunsford guided the department to an elite position in the academic community. Under his guidance, the department established itself as one of the top academic neurosurgical departments in the country—continuing Dr. Jannetta’s tradition of training strong, well-rounded residents—and developed into one of the most extensive neurological research programs in the nation. Dr. Lunsford also established the department as one of the leading stereotactic radiosurgical programs in the world. In 1987, he was responsible for bringing the Gamma Knife to the University of Pittsburgh, the first center in the United States to offer this state-of-the-art, minimally invasive form of brain surgery. The university now has three such devices and is a world leader in Gamma Knife treatment and education, having treated more than 13,300 patients.

In June of 2006, Dr. Lunsford announced his decision to step down as department chair in order to devote more time to his clinical work, clinical investigation, and resident and fellow training. University of Pittsburgh School of Medicine dean, Arthur S. Levine, MD, appointed Amin Kassam, MD, co-director of the department’s minimally invasive program, interim chair of the department. Dr. Kassam was subsequently appointed chairman by Dr. Levine in May of 2007. In June of 2009, Dr. Kassam resigned as chairman.

On June 1, 2010, Robert M. Friedlander, MD, a noted cerebrovascular and neuro-oncologic surgeon, became the fourth chair in the department’s history. Dr. Friedlander carved a prominent career as a clinician and scientist at Harvard Medical School and Women’s Hospital in Boston before coming to Pittsburgh. His strong leadership in both clinical and research areas has further established the University of Pittsburgh Department of Neurological Surgery as a world-leader in the academic neurosurgical field.

In June of 2011, the University of Pittsburgh Department of Neurological Surgery residency program was ranked as the most productive residency program in the nation in terms of graduates remaining and contributing in academic neurosurgery, according to a study published online in the Journal of Neurosurgery.

The study’s authors sought to determine those programs that produce a high number of graduates remaining within academic programs and the contribution of these graduates to
Department Overview

academic neurosurgery. In the study, 97 academic neurosurgery departments with 986 faculty members were analyzed. All data regarding training program and medical school education were compiled and analyzed according to the center from which each faculty member graduated. The neurosurgery training program at the University of Pittsburgh produced the highest number of academic neurosurgeons in this sample.

In another similar study published in the *Journal of Neurosurgery* in 2015, the department ranked among the top five neurosurgical residency programs in the country in terms of academic publishing output of faculty. In this comprehensive, five-year study, researchers used bibliometrics—the statistical analysis of written publications—to calculate the objective impact of academic papers. The results showed that the University of Pittsburgh Department of Neurological Surgery had the third highest score of 103 neurosurgical residency programs across the United States for papers published by its faculty from 2009 through 2013.

Goals/Mission

The Department of Neurological Surgery at the University of Pittsburgh began more than 75 years ago with a commitment to patient care, education and research. Today these goals are still paramount in our pursuit of excellence: first, to provide outstanding care to patients with neurological disease; second, to equip neurosurgeons of the future with state-of-the-art techniques and analytical skills to lead the field of neurosurgery; and third, to foster research designed to enhance the treatment of diverse diseases affecting the nervous system. Although the faculty has had a wide variety of interests over the years, their unity of vision has been remarkable in this regard.

Organization

The main offices of the Department of Neurological Surgery at the University of Pittsburgh are housed on the fourth floor of UPMC Presbyterian. The 2016-17 full-time faculty includes eight professors, 12 associate professors and 15 assistant professors. In addition, there are 12 clinical faculty, seven research faculty and 28 residents at various levels of training. The support staff includes more than 200 physician assistants, clinical coordinators, administrative assistants, nurses, technicians and other personnel.

The department has created a unique environment where “centers of excellence and focused programs” flourish. In this model, neurosurgical subspecialists devote time to research and patient care in focused programs. The use of centers of excellence has strengthened neurosurgery at the University of Pittsburgh and facilitated attainment of our mission.

• Comprehensive Center for Cerebrovascular Neurosurgery

The Comprehensive Center for Cerebrovascular Neurosurgery at the University of Pittsburgh Medical Center is a subspecialized multidisciplinary clinical unit that evaluates and treats all forms of vascular disorders of the brain and spinal cord. Given the high volume of cases managed by the center, it serves as a national and international resource for the management of patients with complex cerebrovascular disease, including aneurysms, arteriovenous malformations (AVMs), arteriovenous fistulas (AVFs), carotid disease, Moya-Moya, and cavernous malformations. With a group of highly subspecialized physicians, center faculty prospectively assess patients and provide broad state-of-the-art treatment options. Since cerebrovascular disease can often be treated using a spectrum of complementary techniques, experts evaluate cases and provide recommendations with the goal of minimizing risks and maximizing long-term efficacy.

The center is directed by department chairman Robert M. Friedlander, MD. Tudor Jovin, MD, of the UPMC Stroke Institute, heads up our Center for Neuroendovascular Therapy. Other members of our team include Brian Jankowitz, MD—the neuroendovascular surgery fellow-
Department Overview

ship director—Bradley Gross, MD, Ashutosh Jadhav MD, PhD, Paul A. Gardner, MD, and Daniel A. Wecht, MD.

Challenging cases are reviewed prospectively in our weekly multidisciplinary cerebrovascular conference. All the key subspecialists are represented and discuss the individual features of each case. Individual consideration is given to each patient to tailor the most effective therapy taking into consideration a number of important features including patient age, overall health status, and specific anatomical consideration of their vascular abnormality.

The Cerebrovascular Neurosurgery Center works in close collaboration with the UPMC Stroke Institute—staffed by neurologists with additional training in vascular neurology—including Lawrence Wechsler, MD, (Chairman, Department of Neurology), Tudor G. Jovin, MD, (Director, UPMC Stroke Institute; Medical Director, UPMC Presbyterian Stroke Service), Maxim D. Hammer, MD, (Vice Chairman, Department of Neurology), Ashutosh P. Jadhav, MD, PhD, (Director, Vascular Neurology Training Program; Medical Director, UPMC Mercy Stroke Service; Medical Director, UPMC Shadyside Stroke Service), Matthew T. Starr, MD, and Marcello Rocha, MD.

• Human Neural Prosthetics Program
The Human Neural Prosthetics Program is the result of a multidisciplinary effort to explore the utilization of brain computer interfaces for improving the lives of patients with motor disabilities. In 2007, a collaborative group was established—representing expertise in engineering, neuroscience and rehabilitation—to promote clinical trials using brain computer interfaces to control neural prosthetic devices.

Elizabeth Tyler-Kabara, MD, PhD, and Wei Wang, MD, PhD (Department of Physical Medicine & Rehabilitation) obtained an initial grant to evaluate micro-ECoG grids in patients in the Epilepsy Monitoring Unit. Data from this study demonstrated that patients could utilize a brain computer interface to control a computer cursor. This grant served as the kick-start for two clinical trials.

In the first, quadriplegic patients are implanted with a custom-designed ECoG grid for up to 30 days. The first subject was able to obtain consistent three-dimensional cursor control using a 3D visual environment. He was also able to successfully control a robotic arm. Additional subjects have also successfully achieved cursor control in a 3D virtual environment and control of a robotic arm. The initial work was funded by the Cortical Control of a Dextrous Prosthetic Hand study funded by National Institute of Neurological Disorders and Stroke (NINDS) and Andrew B. Schwartz, PhD (Department of Neurobiology) was the principle investigator.

A second study utilizes microelectrode arrays that penetrate the surface of the brain. This study is funded by the Defense Advanced Research Projects Agency (DARPA) and is part of the Revolutionizing Prosthetics Program, Phase 3 study for which Michael L. Boninger, MD, chairman of the Department of Physical Medicine & Rehabilitation, is the principle investigator. In the study, two 96-channel electrode arrays were implanted into the brain of a quadriplegic individual. This study participant was able to obtain control of up to 10 degrees of freedom. Using seven degrees of freedom, she has been able to utilize the robotic arm to perform standardized rehabilitation tasks, such as placing objects on a shelf. Once FDA approval was obtained, she was able to interact personally with the robotic arm and was able to grasp a food item and feed herself. As part of the Revolutionizing Prosthetics Program, Phase 3 study, investigators also obtained FDA approval to place stimulating arrays in conjunction with recording arrays in anticipation of adding sensory feedback to the control of the robotic arm. A second subject was implanted with two recording arrays in motor cortex and two stimulating arrays in sensory cortex. This subject was able to experience a natural-like sense of touch when the fingers of the robotic arm were
Department Overview

stimulated by touch. In sensory tests, he was able to correctly identify which finger was touched while blindfolded.

Future studies are currently under development. Researchers are working on FDA approval for chronic ECoG implantation for stroke rehabilitation. Pilot funding has been obtained through the Aging Institute. Investigators hope to begin up to one-year studies soon. Development of a wireless system is also under development with plans to start non-human testing soon.

• Center for Cranial Base Surgery
Cranial base surgery has a long tradition at the University of Pittsburgh. The UPMC Center for Cranial Base Surgery—under the current direction of Paul Gardner, MD, in the Department of Neurological Surgery and Carl Snyderman, MD, MBA, in the Department of Otolaryngology—is the first skull base center to be established in North America and has pioneered both transcranial microscopic and endoscopic endonasal approaches to the skull base and brain. L. Dade Lunsford, MD, established the first gamma knife center in North America at UPMC in 1987, and was also the first to introduce radiosurgery for the non-operative treatment of skull base tumors.

Experts at the UPMC Center for Cranial Base Surgery, including associate directors Juan Fernandez-Miranda, MD and Eric Wang, MD, continue to lead the field of minimally invasive brain surgery by developing new techniques, tools and approaches that have made it possible to access many tumors, regardless of size. Since 1997, more than 3000 endonasal surgeries have been performed in adults and children, making UPMC one of the busiest centers in the world for the surgical treatment of tumors of the pituitary region and cranial base. By combining this innovative approach with other minimally invasive approaches like transorbital and endoscopic-assisted retromastoid approaches, the team at UPMC provides a full array of options for cutting edge treatment of skull base disease. Children’s Hospital of Pittsburgh of UPMC is unique in its ability to provide comprehensive skull base surgery with a dedicated skull base team under the leadership of pediatric neurosurgeon Elizabeth Tyler-Kabara, MD, PhD.

Drs. Gardner, Snyderman, Fernandez-Miranda, Wang, and Tyler-Kabara, along with Tonya Stefko, MD, in ophthalmologic surgery, and Barry Hirsch, MD, and Andrew McCall, MD in neuro-otology, comprise a team of experts in cranial base surgery, advancing patient care through clinical outcomes studies, in-depth anatomical study, molecular science and genetics research and an international training program.

The concept of team surgery allows the center to select the best surgical approach for each tumor, with a surgical plan designed around the particular needs of the individual patient. Treatment is designed to offer the best surgical outcome with the least side effects and maximal preservation of function. A full array of transcranial approaches, minimally invasive key-hole approaches and endoscopic endonasal approaches are routinely applied with proven and studied success. The UPMC Center for Cranial Base Surgery is also a major teaching destination for surgeons and other health care professionals looking to learn more about these techniques. Faculty teach three courses a year at UPMC, featuring live surgery and hands-on laboratory work. They also travel the world teaching these procedures to the next generation of skull base surgeons.

• Center for Cranial Nerve and Brainstem Disorders
The Center for Cranial Nerve and Brainstem Disorders, under the direction of Raymond F. Sekula Jr., MD, joins experts in a variety of medical disciplines, including neurosurgery, neurology, neurophysiology, radiology, anesthesia, neuro-oncology, and neuro-otology with the intent
of providing the most advanced care for a variety of brain disorders. The goal of the center is to provide the very best outcomes for patients with a variety of disorders in the most minimally invasive manner.

Building upon pioneering work accomplished by University of Pittsburgh faculty over the past four decades, the Center for Cranial Nerve and Brainstem Disorders is the international leader in the management of trigeminal neuralgia, hemifacial spasm and glossopharyngeal neuralgia. In addition, the center continues to expand and pioneer treatments directed at other abnormalities in and around the brainstem.

The center is driven by outcome-based clinical research and basic science research projects aimed at understanding the biologic mechanisms of diseases within the realm of the center. In recent years, this research has resulted in improved outcomes for patients and new therapies for a variety of disorders.

- **Neurosurgical Oncology Program**

  The University of Pittsburgh’s Neurosurgical Oncology Program includes leading neurosurgeons, neuro-oncologists, radiation oncologists, neuropathologists, researchers, rehabilitation experts, nurses and support staff. This multidisciplinary team delivers compassionate and sophisticated care and uses the latest technologies to treat patients with tumors of the brain, spine and skull base. Education, support and counseling for family members are important parts of the program.

  The Neurosurgical Oncology Center features two clinical divisions: the Adult Neurosurgical Oncology Program and the Pediatric Neurosurgical Oncology Program. Both operate under the auspices of the comprehensive Brain Tumor Program, centered at the Hillman Cancer Center of the University of Pittsburgh Cancer Institute (UPCI). The Brain Tumor Program supports clinical trials and basic science research for patients with brain tumors and is led by Ian Pollack, MD.

  The Adult Neurosurgical Oncology Center, led by Johnathan Engh MD, (director) and Nduka Amankulor, MD, (associate director), is dedicated to providing the best treatment available for patients with both benign and malignant tumors of the brain and spine. The center is also dedicated to discovering novel and effective therapies for these diseases.

  This center has been a leader in the implementation of cutting-edge technologies such as stereotactic radiosurgery using the Gamma Knife, CyberKnife, and image-guided tumor resection using intraoperative CT and MRI. Other technologies, including minimally invasive techniques for tumor removal using intracranial endoscopic port surgery (Neuroendopore™) and endoscopic endonasal approaches to the skull base have been pioneered at this center.

  The use of advanced imaging modalities, such as high definition white matter fiber tract imaging and magnetoencephalography, has also facilitated better outcomes for selected patients with tumors. In addition, fluorescent-guided brain tumor resection and awake craniotomy techniques have been used to maximize safe removal of brain tumors at the cancer center.

  As an international referral center for both adult and pediatric brain tumors, the center ranks among the top neuroscience programs in the nation. Faculty members provide consultation and guidance for local, national and international referrals. Patients with both primary brain and spine tumors and metastatic tumors are seen in the Hillman Cancer Center in a multidisciplinary clinic that includes representation from neurosurgery, neuro-oncology and radiation oncology. A weekly multidisciplinary neuro-oncology tumor board is a forum for a team of specialists to review patient problems and to formulate management recommen-
Department Overview

dations. The tumor board draws from the expertise of the neurosurgery, neurology, radiology, pathology and radiation oncology faculty at UPMC. Similarly, there is a weekly skull base tumor board with involvement from otolaryngology/head and neck cancer specialists, neuro-ophthalmology, radiology, and adult and pediatric neurosurgery.

Our team is also actively studying other neurological complications of systemic cancer and its treatment, including stroke, neurobehavioral disorders, neurological complications of chemotherapy and/or radiation therapy, and paraneoplastic neurological syndromes, in collaboration with medical neuro-oncologists Frank Lieberman, MD, and Jan Drappatz, MD.

The University of Pittsburgh is a member of the American Brain Tumor Consortium, which conducts clinical trials to evaluate novel chemotherapy and molecular treatments for adults with malignant primary brain tumors. In addition to membership in this group, the site is one of the few in the country that is also a member of the Pediatric Brain Tumor Consortium and the Collaborative Ependymoma Research Network, highlighting the breadth of the neuro-oncology expertise across the age spectrum. The University of Pittsburgh serves as the coordinating center for the North American Gamma Knife Consortium, which links 18 academic centers of excellence in radiosurgery. Moreover, investigators have been at the forefront of development of innovative biological therapeutic approaches for patients with brain tumors, such as immunotherapy using brain tumor vaccines and radiosurgery coupled with bevacizumab.

The Spine Oncology Radiosurgery Program, led by Peter C. Gerszten, MD, MPH, is the most experienced center in the world in using radiosurgery to treat a wide variety of both malignant and benign spinal and paraspinal tumors. This highly effective therapy is both safe and painless, and avoids many of the risks associated with open surgery.

• Spine Services Division
The Neurosurgical Spine Division at the University of Pittsburgh is a multidisciplinary organization composed of specialists in the fields of physical therapy, physical medicine and rehabilitation, interventional neuroradiology and neurological spine surgery. Specialists from these fields work together as a unified group to provide the highest quality care for patients and athletes who have spine injuries, painful disc conditions, neck, arm, back or leg pain.

Adam S. Kanter, MD, is chief of neurosurgical spine services and also leads the minimally invasive spine program. David O. Okonkwo, MD, PhD, leads the spinal deformity program and D. Kojo Hamilton, MD provides specialty care in the treatment of cervical malalignment and spinal deformity. Peter C. Gerszten, MD, MPH, leads the percutaneous and spine radiosurgery programs. The community division is led by Joseph Maroon, MD, and Matt El-Kadi, MD, PhD.

The Neurosurgical Spine Services Division offers comprehensive care for all types of spinal disorders, including degenerative, traumatic, and oncologic conditions. The initial treatment approach is typically non-surgical, with surgical options reserved for patients with recurrent or disabling symptoms and/or progressive deficits. Complete diagnostic testing of all spinal and nerve disorders is available through the center.

The minimally invasive program, led by Dr. Kanter, utilizes state-of-the-art portal techniques and lateral access corridors to minimize trauma and disruption of stabilizing back muscles. The spinal deformity program, led by Dr. Okonkwo, offers full-scale analysis, longitudinal tracking and treatment interventions for patients with scoliosis and thoracolumbar spinal deformity. Together, they continue to push the surgical envelope and combine their unique
skill sets to provide each and every patient with the least invasive yet maximally effective treatment options.

Dr. Hamilton correspondingly treats complex cervical deformity, such as swan neck and chin-on-chest disorders, in addition to thoracolumbar scoliosis, oncologic and degenerative spine conditions. The spine radiosurgery program, led by Dr. Gerszten, is one of the most experienced centers in the world in treating a wide variety of benign and malignant spine and paraspinous tumors that has proven highly effective, safe, and painless, and avoids many of the risks associated with open surgery.

Within the division is the Center for Surgical Pain Management led by John J. Moossy, MD. This program provides a variety of surgical options for the management of medically intractable pain syndromes. The range of treatment varies from neuroaugmentation (i.e., spinal cord stimulation and intrathecal opioids) to surgical decompression (with or without spinal fusion) to ablative neurosurgery.

The Neurosurgical Spine Services Division works together as a unified team, utilizing a multidisciplinary approach to maximize patient care and outcomes. An array of research studies and protocols are employed to deliver unsurpassed treatment strategies, ensuring that patients receive the best state-of-the-art care in the country.

• Center for Image-Guided Neurosurgery

The Center for Image-Guided Neurosurgery, led by L. Dade Lunsford, MD, Lars Leksell Professor, incorporates the expertise of individuals in image-guided stereotactic and functional neurosurgery, brain tumor surgery, Gamma Knife radiosurgery, neuro-oncology, radiation oncology and neuro-radiology. Ajay Niranjan, MD, MBA, is associate director of the center. Edward Monaco III, MD, PhD, joined the center in July of 2013 as co-associate director. The goal of the center is to provide quality patient care using minimal access or minimally invasive stereotactic and radiosurgery technology, high resolution neuroimaging and advanced computer systems. In 1981, the center was the first U.S. center to install a dedicated computed tomography (CT) scanner in a unique stereotactic operating room suite. The suite was updated in 2009.

As the first North American group to initiate a clinical program for Gamma Knife stereotactic radiosurgery in 1987, the Center for Image-Guided Neurosurgery continues to be a leader in this field. Currently two Gamma Knife units are located at UPMC Presbyterian, one of the few clinical sites in the world with two clinical units. In the fall of 2007, the Leksell Gamma Knife Perfexion™ was installed. This generation Gamma Knife unit incorporates advanced robotics, expands the role of radiosurgery to include extracranial targets, provides greater patient access, and enhances patient safety. Gamma Knife technology represents one of the most advanced means available to help patients with brain tumors, arteriovenous malformations (AVMs), and pain or movement disorders. More than 14,500 patients have undergone Gamma Knife stereotactic radiosurgery at UPMC Presbyterian. In addition, spinal radiosurgery using several radiosurgical systems is offered under the direction of Peter Gerszten, MD, who serves as the Peter E. Sheptak Endowed Chair in spinal neurological surgery. In 2016, UPMC installed its sixth Gamma Knife, the newest generation ICON Gamma Knife with cone beam CT imaging.

The Center for Image-Guided Neurosurgery is also an international training site for radiosurgery and minimally invasive neurosurgery, holding six week-long training courses per year. Over the last 20 years, more than 2,200 neurosurgeons, neurootologists, radiation oncologists, medical physicists, and nurses have trained at this center. These courses are
among the highest rated post-graduate courses offered at the University of Pittsburgh. In 2015, the center opened a new state-of-the-art education and training facility equipped with the latest generation high definition display systems. The center also has a dedicated Elekta NeuroMag® magnetoencephalography (MEG) unit that performs brain mapping in patients with structural brain lesions, epilepsy, trauma and degenerative brain disorders. Dr. Niranjan is the operations director of the MEG project.

In addition, the center conducts numerous clinical, long-term outcome research projects and is the coordinating center for the International Gamma Knife Research Foundation (IGKRF), a multi-institutional international clinical consortium of centers of excellence performing stereotactic radiosurgery using the Leksell Gamma Knife. The IGKRF currently has members from the US, Canada, the Czech republic, Spain, Taiwan, Egypt and Turkey. Multiple retrospective clinical trials have been published or are underway. More than 5,000 articles have now been published worldwide in the field of stereotactic radiosurgery. The University of Pittsburgh has the highest number of studies that have been cited more than 100 times. More than 500 peer reviewed articles, several hundred book chapters, and eleven books have been published by individuals affiliated with this center since it opened in 1981.

This multidisciplinary center includes the clinical and research efforts of neurosurgeon Hideyuki Kano, MD, PhD, and radiation oncologists John Flickinger, MD; Yoshio Arai, MD; Susan Rakfal MD; Duk il Sung, MD; and Melvin Deutsch, MD. The participating medical physics group consists of Jong Oh Kim, PhD; Kevin Fallon, MS, and Greg Bednarz, PhD. Grace Yum provides assistance in medical informatics.

More than 100 U.S. or international fellows have received training at this center since 1987. The center provides an opportunity for advanced training in image-guided stereotactic and functional surgery at the fellowship level. Current international research fellows are from China and Japan. The fellowship has two tracks, one for candidates interested in a functional focus (movement disorders, pain, and epilepsy) under the mentorship of R. Mark Richardson, MD, PhD, and one for candidates focusing on neurooncology and radiosurgery. This one-year opportunity is approved by the Society of Neurological Surgeons Committee on Advanced Specialty Training (CAST).

- Pediatric Neurosurgery

The Pediatric Neurosurgery Division at Children’s Hospital of Pittsburgh of UPMC is led by Ian Pollack, MD, and includes three other full-time faculty, Elizabeth Tyler-Kabara, MD, PhD, Stephanie Greene, MD, and Mandeep Tamber, MD, PhD. The division provides care for children with tumors, spinal and cranial deformities, vascular malformations, spasticity and epilepsy, and peripheral nerve disorders, and has gained international recognition for the treatment of pediatric brain tumors, cerebral palsy and traumatic brain injury.

The center’s neurosurgeons work closely with specialists in pediatrics, surgery, radiation therapy, oncology, physical therapy, orthopedics, plastic surgery, critical care and social services. Through its neuro-oncology program, the center provides comprehensive, multi-disciplinary care for patients with brain and spinal cord tumors, in collaboration with the oncology and radiation therapy programs. Patients may be eligible for treatment in one of many innovative research protocols at Children’s Hospital. These protocols—several of which are unique to Children’s or available at only a few centers throughout the country—provide Children’s patients access to new treatments and promising studies. Dr. Pollack is the institutional principal investigator and chair of the Neurosurgery Committee in the Pediatric Brain Tumor Consortium, supported by the National Cancer Institute to perform cutting-edge clinical trials in children with brain tumors, and serves as the principal investigator on several studies involving vaccine-based immunotherapy for children with challenging brain tumors.
In addition, Dr. Tyler-Kabara has helped to pioneer the use of endoscopic endonasal approaches to the skull base in the pediatric population. Children’s Hospital offers this minimally invasive approach to skull base pathologies (tumor, congenital, and trauma), even in children under the age of two. The clinical program is augmented by NIH-funded, laboratory-based research initiatives examining molecular markers of prognosis and novel treatment strategies in patients with glial tumors and ependymomas.

The division is an integral collaborator in the Cleft-Palate and Craniofacial Center in the management of children with craniofacial disorders. Because children with complex craniosynostosis often require a staged approach to the treatment of their cranial, midfacial and lower facial deformities, close multidisciplinary follow-up is maintained throughout childhood and adolescence in order to optimize long-term functional and cosmetic outcome.

The Surgical Epilepsy Program is the only center in the region able to provide comprehensive evaluation and surgical treatment options for children with intractable epilepsy. Dr. Tamber, the lead epilepsy neurosurgeon, collaborates closely with epileptologists within the Division of Pediatric Neurology. A comprehensive pre-surgical evaluation, using state-of-the-art neuro-imaging resources, is carried out to identify the specific site in the brain causing seizures and to determine its relationship to important functional areas of the brain. Surgical candidates benefit from a full spectrum of treatment options, ranging from lesionectomies (guided by intraoperative electrocorticography), tailored cortical resections following a period of invasive subdural EEG monitoring, corpus callosotomies and hemispherectomies. Other patients may benefit from vagus nerve stimulation. Children’s Hospital has implanted more than 350 vagus nerve stimulators (VNS) making it one of the busiest VNS programs in the country.

The program is also involved in cutting edge clinical and basic research focused on developing and applying new and improved treatments for children with movement disorders. The Spasticity and Movement Disorders Clinic, led by Dr. Tyler-Kabara, is made up of a team of pediatric medical professionals who specialize in the comprehensive, multidisciplinary evaluation and treatment of children and young adults with spasticity and other movement disorders, such as dystonia, chorea, athetosis and tremor. The purpose of the clinic is to determine whether a patient would benefit from treatment with oral medications, intrathecal baclofen, selective dorsal rhizotomy, intramuscular botox injection, deep brain stimulation or other therapies.

The division is actively involved in the Brain Trauma Research Program, the Fetal Diagnosis and Treatment Center, the Vascular Anomalies Center and the Brachial Plexus Program. In conjunction with a team of specialists at Magee-Womens Hospital, Dr. Greene has established a program to treat babies with myelomeningocele, or spina bifida, with in utero surgery here in Pittsburgh. Babies who are not candidates for in utero surgery undergo conventional closure of the defect within several days of birth. These children are seen throughout childhood by a multidisciplinary team of medical professionals in the Spina Bifida Clinic at Children’s Hospital of Pittsburgh, one of the largest such clinics in the country. Expectant mothers are referred by the Fetal Diagnosis and Treatment Center at Magee-Womens Hospital for counseling in the pediatric neurosurgery clinic if prenatal imaging reveals a potential neurosurgical abnormality.

The Brachial Plexus Birth Injury Clinic—run through the division of pediatric plastic surgery—manages infants with birth injuries to the brachial plexus in a collaborative fashion with specialists from neurosurgery, plastic surgery, orthopedic surgery, and physical and occupational therapy. Dr. Greene and Lorelei J. Grunwaldt, MD of plastic surgery perform
the necessary operations on infants together, bringing their different expertise to bear on the problem in a collaborative fashion. Children’s Hospital of Pittsburgh is one of a handful of centers in the country that have a dedicated multidisciplinary clinic for these patients, and is the only such program in the region. Patients with peripheral nerve tumors or injuries are seen by Dr. Greene outside of the Brachial Plexus Program.

Dr. Tamber has worked to include Children’s Hospital of Pittsburgh of UPMC in several large multi-center clinical networks that are dedicated to the study of common pediatric disorders. CHP is a member of the Hydrocephalus Clinical Research Network, a group of seven premier pediatric neurosurgical departments in North America that are dedicated to designing and undertaking field-changing prospective research into pediatric hydrocephalus. In addition, CHP has been selected as a member institution in the Park-Reeves Syringomyelia Research Consortium, a group dedicated to solving important clinical problems within the realm of Chiari malformation and syringomyelia. Dr. Tamber is the institutional principal Investigator for both of these endeavors. In addition, Dr. Tamber is the principal investigator at Children’s Hospital for a new prospective multicenter collaboration dedicated to studying and improving the clinical outcomes of children with craniofacial disorders.

Patients with vascular anomalies such as aneurysms, arteriovenous malformations, cavernous malformations, and moyamoya syndrome are managed by Dr. Greene, the director of vascular neurosurgery at Children’s Hospital. Select patients undergo further evaluation at the department’s Center for Image-Guided Neurosurgery with L. Dade Lunsford, MD, for possible radiosurgical treatment, angiography by an interventional radiology team, for further definition of anomalies and possible embolization of feeding vessels to reduce blood flow to a malformation, and assessment by a vascular neurologist for management of seizures, dystonia, and coagulopathies that may be identified during the course of the evaluation process. Such comprehensive evaluation best identifies those patients who would benefit from surgical intervention. Patients with vascular problems involving more than one organ system, or those with syndromes such as Sturge-Weber or PHACES, are seen in the multidisciplinary Vascular Anomalies Clinic, one of the largest of its kind in the country.

• Brain and Spine Injury Program
The Brain and Spine Injury Program consists of a number of programs developed to better understand and treat the problems associated with traumatic injury to the central nervous system, brain and spinal cord, in both adults and children.

The department’s adult clinical neurotrauma division, led by David Okonkwo, MD, PhD, remains a world leader in the treatment of and research into traumatic brain injury. The neurotrauma service works closely with integral colleagues from the Trauma Division, Critical Care Medicine, Neurophysiology, Neuroradiology, and Physical Medicine and Rehabilitation to provide the most sophisticated treatments available to persons suffering from traumatic brain injury.

The department collaborates with investigators worldwide to advance the evaluation, treatment and outcomes of patients suffering traumatic injuries of the spinal column and spinal cord. The Neurotrauma Clinical Trials Office provides the infrastructure necessary to carry out the large number of active research protocols ongoing within the program. Recent trials launched include the first stem cell trial for chronic spinal cord injury to be conducted in Pennsylvania.

Clinical efforts in traumatic brain injury are conducted in collaboration with research carried out through the Brain Trauma Research Center (BTRC) under the direction of C. Edward Dixon, PhD. The BTRC is a multidisciplinary, multid部mental research program aimed at improving
outcome following severe traumatic brain injury. Research conducted both at the center and at other brain injury research programs clearly demonstrates the potential for improving outcome using therapies designed to treat biochemical derangements that occur following impact to the brain. The BTRC has pioneered efforts using temperature manipulation and cerebral blood flow monitoring in the treatment of severe head injury and has conducted landmark investigations into the mechanisms of induction and recovery of head trauma and secondary injury.

The Pediatric Neurotrauma Center (PNTC), under the leadership of Michael J. Bell, MD (Critical Care Medicine) and Mandeep Tamber, MD, PhD, (Pediatric Neurosurgery) has both basic science and clinical research programs aimed at understanding the pediatric response to neural injury, as well as the unique elements of recovery that are specific to traumatic central nervous system injuries in children. This section coordinates services for injured children at Children’s Hospital of Pittsburgh of UPMC, which operates the region’s only Level I pediatric trauma center. The goal of the center is to provide optimal care between the time of injury and discharge. Subspecialists in all pediatric medical and surgical disciplines are readily available to provide definitive care. As one of the most established and comprehensive programs in the country, the PNTC has been at the forefront of pediatric neurotrauma research not only locally but also nationally and internationally, serving as an important resource for collaborative programs such as multi-institutional clinical trials designed to improve outcomes, as well as efforts aimed at developing consensus clinical guidelines for the care of children with traumatic neurological injury. Research is progressing at a vigorous pace, with the implementation of several new phase I/II clinical trials, the start of a comparative effectiveness study to discern barriers to implementation of evidence-based guidelines and the continuing support of a T32-training grant in pediatric neurocritical care.

- Brain Stimulation and Epilepsy Surgery Program

The Epilepsy and Movement Disorders Program at the University of Pittsburgh, directed by R. Mark Richardson, MD, PhD, encompasses the treatment of movement disorders, obsessive-compulsive disorder, and epilepsy. These brain diseases are similar in that successful neurosurgical treatment requires an expert understanding of the involved brain networks and their potential for modulation by functional neurosurgical procedures, as well as multidisciplinary teams that deliver surgical care to these special groups of patients.

Both awake and asleep deep brain stimulation (DBS) surgery are offered for movement disorders, including Parkinson’s disease, essential tremor, dystonia (including Meige syndrome), and pediatric movement disorders. The traditional micro-electrode-guided program is augmented by NIH BRAIN Initiative-funded intraoperative research in speech production. In addition, the University of Pittsburgh Department of Neurological Surgery is the only department in Pennsylvania offering asleep, interventional-MRI based DBS (at UPMC Presbyterian) and asleep, CT-verified DBS (at UPMC Hamot).

In March 2017, UPMC became the first program in the state to begin utilizing new directional lead technology. In addition to having a very high DBS surgical volume, the movement disorders surgery program is currently one of only three sites participating in a Phase 1 clinical trial of iMRI-guided AAV2-AADC Gene Therapy in Parkinson’s disease. The program also performs DBS for the treatment of OCD in patients who have had a diagnosis of chronic, severe, treatment-resistant OCD that has become disabling. Additionally, FDA approval was recently obtained for a Phase 1 clinical trial of DBS to treat late-life treatment-resistant depression, to be co-led by Jordan Karp, MD (Department of Psychiatry) and Dr. Richardson.

UPMC Presbyterian also houses the region’s foremost center for the comprehensive neurosurgical treatment of all types of adult epilepsy, including epilepsy caused by lesions visible
on MRI (sclerosis, dysplasia, brain tumors, cavernous malformations) and epilepsy where the seizure onset location is not obvious and must be discovered by intracranial monitoring, including stereo-electroencephalography using the Robotic Stereotactic Assistant (ROSA). Part of the University of Pittsburgh Comprehensive Epilepsy Center, the surgery program is one of the busiest in the nation, offering the latest treatments for patients suffering from multiple types of epilepsy, including Responsive Neurostimulation (RNS) and laser thermal ablation, also known as laser interstitial thermal therapy (LITT).

- Center for Clinical Neurophysiology

The Center for Clinical Neurophysiology (CCN) at UPMC was organized in 1981 to serve as an interdepartmental resource serving then-Presbyterian University Hospital, Montefiore Hospital and Children’s Hospital of Pittsburgh. At that time, the CCN was composed of just a few clinicians providing diagnostic testing and intraoperative neurophysiological monitoring (IONM) services for only very specific surgeries in the neurosurgical and orthopedic disciplines.

The service has now grown to providing more than 7,000 IONM cases per year at all UPMC pavilions, as well as supporting UPP surgeons at non-UPMC hospitals. The use of IONM at UPMC reaches across many surgical disciplines and has proven to be an invaluable adjunct not only in adult and pediatric neurosurgical procedures but also in orthopedic, ENT, vascular, cardiothoracic and interventional neurological procedures.

The CCN and its highly trained and nationally renowned faculty and technical staff’s primary goal is to provide high quality service in a cost-efficient manner to the UPMC patient population. The center focuses on interdisciplinary research to improve the understanding and the value of IONM to predict and prevent nerve injury. In addition, CCN faculty teach a one-term undergraduate course in the Department of Neuroscience as well as teach medical students, residents and fellows the value of IONM, during surgical procedures.

The CCN is the largest and busiest academic IONM program in the country, offering and providing services at all UPMC hospitals including UPMC Hamot and Altoona. In addition, the CCN provides professional and technical services at Mon Valley, Jameson and Trinity (Steubenville, Ohio) Hospitals. The CCN faculty is able to achieve this service expansion to community hospitals through the use of telemedicine technology. Patients in community hospitals, more than 100 miles away, can receive the same quality care without having to travel to Pittsburgh.

Intraoperative multimodality monitoring at UPMC includes expertise in somatosensory evoked potentials (SSEP), brainstem auditory evoked potentials (BAEP), transcranial motor evoked potentials (TcMEP), electroencephalography (EEG) and electromyography (EMG). Direct peripheral nerve recordings (CNAP and CMAP) are also are performed, as well as single unit micro-electrode recordings (MER) performed for subcortical mapping during placement of DBS electrodes in various subcortical structures. EEG is used to monitor cerebral function and ischemic risk during cerebral and peripheral vascular procedures, including cerebral aneurysm treatment, carotid endarterectomy and a variety of cardiothoracic procedures.

EEG recorded directly from the pial surface of the brain, or electrocorticography (ECoG), is used to help determine resection margins in epilepsy surgery, and to monitor for seizures during direct electrical stimulation of the brain surface carried out while mapping eloquent cortex in awake patients. In addition to providing IONM services, the CCN also performs diagnostic evoked potential testing, and transcranial Doppler studies.
Department Overview

Accomplishments and Highlights of Note

The CCN is proud to provide a high quality service at a significantly low cost to patients, which it is able to achieve by constantly evaluating and improving clinical services through its various research initiatives and quality improvement programs. The center’s cutting-edge research efforts—represented by multiple, peer-reviewed publications in high quality journals each year—have demonstrated the value of the application of multimodality intraoperative neurophysiological monitoring to improved patient safety during various peripheral and central nervous system operative procedures.

• Community Neurosurgery

The University of Pittsburgh Department of Neurological Surgery Community Division provides state-of-the-art neurosurgical care in community hospitals in the greater Pittsburgh area, offering excellent care in an environment close to family and friends. Community neurosurgeons see patients and provide advanced clinical care in an area stretching from Ohio to Altoona, Pa., and from West Virginia to Erie. These physicians offer a wide range of subspecialty skills, including minimally invasive neurosurgery, general and complex spine surgery, peripheral nerve surgery, and brain and vascular neurosurgery. This local initiative is offered to help provide convenience for the community and to promote an atmosphere of reassurance and comfort for the patient.

Accomplishments and Highlights of Note in Fiscal Year 2016-17

July 2016

• Joseph Maroon, MD, completed the Muncie (Ind.) 70.3 Ironman, taking first place in his division. Dr. Maroon was ranked second nationally, and fourth globally, in his age division, M75-79.

• R. Mark Richardson, MD, PhD, was featured on the KDKA-TV Evening News talking about how deep brain stimulation can help patients with severe obsessive-compulsive disorder.

August 2016

• L. Dade Lunsford, MD, was featured in a WPXI-TV News at 6 “Proud to be from Pittsburgh” segment that discussed how a former patient’s experience with Dr. Lunsford inspired a career in medicine.

• Kamil Nowicki, MD, PhD, was awarded two grant awards totaling $35,000 from the Brain Aneurysm Foundation for his project, “Targeting Platelet Inflammatory Axis in Cerebral Aneurysm Progression and Healing.” The awards are part of the foundation’s Chairs of Research Program that funds basic scientific research directed at early detection, improved treatment modalities, and technological advances.

September 2016

• Robert Friedlander, MD, was honored as a ‘Doctor of Distinction’ by the Ladies Hospital Aid Society at the group’s 118th Brain Gain Gala Fundraiser.

• Robert Friedlander, MD, was featured in a KDKA-TV Evening News story that showed how High Definition Fiber Tracking (HDFT) helped save the vision of a patient diagnosed with a glioblastoma.

• R. Mark Richardson, MD, PhD, was featured in a CBS TV-2 (New York) news report on deep brain stimulation for severe obsessive compulsive disorder.
October 2016

- David Okonkwo, MD, PhD, was featured in a *Pittsburgh Post-Gazette* article that reported on a Journal of Neurosurgery paper stating that concussion is treatable, a major first step in medical literature.

- It was announced that R. Mark Richardson, MD, PhD, will lead a multidisciplinary team of experts from the University of Pittsburgh, Carnegie Mellon University, and Johns Hopkins University in a major $3.3 million research project designed to gather a deeper understanding of how speech is controlled in the brain.

- Georgios Zenonos, MD, received the best presentation award at the twelfth annual Stuart Rowe Society Lectureship and Resident Research Day for his talk "The Genetic Landscape of Clival Chordoma." Gregory Weiner, MD, received the second-place award for his presentation "Limitations of the 64 Channel Multidetector Computerized Tomography Angiography for Diagnosis of Blunt Cerebrovascular Injury." It was the second year in a row that Dr. Weiner was honored with the second place award.

- It was announced that David Okonkwo, MD, PhD, will coordinate clinical efforts in a multimillion dollar research project—potentially totaling up to $90 million over ten years—intended to help improve trauma care for both civilians and military personnel. The Linking Investigations in Trauma and Emergency Services (LITES) Network will include extensive data collection covering pre-hospital care through recovery after discharge on potentially thousands of trauma cases across the country.

- David Okonkwo, MD, PhD, and Elizabeth Tyler-Kabara, MD, PhD, were both prominent participants in the first-of-its-kind White House Frontiers Conference, a national convening of hundreds of leading scientists, innovators, and industry officials designed to explore the future of scientific innovation, held in Pittsburgh, October 13. Hosted by the White House, the University of Pittsburgh, and Carnegie Mellon University, the conference focused on building U.S. capacity in science, technology, and innovation, and the new technologies, challenges, and goals that will continue to shape the 21st century and beyond.

- Ajay Niranjan, MD, received the Allen Humphrey Excellence in Mentoring Award from the University of Pittsburgh. The award is presented to a Dean’s Summer Research Program (DSRP) mentor who demonstrated exemplary care and commitment in all aspects of DSRP student mentoring.

November 2016

- Joseph Maroon, MD, was featured in a *Beaver County Times* article that talked about his efforts to put together a brain health program across the St. Barnabas Health System, a long-term senior living community in the Pittsburgh area.

- Joseph Maroon, MD, was named to the medical advisory panel of the newly formed Chuck Noll Foundation for Brain Injury Research. The foundation — honoring the late, legendary Pittsburgh Steelers head coach who challenged physicians to develop an objective analysis of head injuries — will help fund research deemed most promising in the area of sports-related concussions and related conditions.

Department Overview
Accomplishments and Highlights of Note

December 2016
- Fang-Cheng (Frank) Yeh, PhD, was first author on a unique study that showed how scientists can “fingerprint” the brain, confirming that structural connections in the brain are unique to each individual person. The study was featured in a number of science journals across the country.

- Robert Friedlander, MD, and William Ares, MD, were featured in an Altoona Mirror article that showcased how UPMC is utilizing telemedicine in examining post-op patients.

- The UPMC Presbyterian Gamma Knife team received the UPMC Achievement in Excellence Award, given quarterly to a UPMC team that demonstrates excellence in patient care. The Gamma Knife staff received the award for their outstanding work following a flood in the Gamma Knife unit. With water damage to most of the unit from a burst pipe, the staff was forced to work off-site and for long hours. They never lost sight of ensuring top quality care for all their patients. They came together as a team in a very difficult situation.

January 2017
- Joseph Maroon, MD, released a new book, Square One: A Simple Guide to a Balanced Life, that takes a look at the importance of understanding where you are in life and the need to keep all elements of your life in proper “balance.”

- David Okonkwo, MD, PhD, was featured in a Pittsburgh Post-Gazette article that detailed his contribution in a rare spinal cord surgery for a special water rescue dog.

- R. Mark Richardson, MD, PhD, was featured on GoErie.com in an article that talked about research and funding for deep brain stimulation for Parkinson’s disease patients.

February 2017
- Joseph Maroon, MD, was a guest on the KDKA Radio Morning News Show discussing his new book, Square One: A Simple Guide to a Balanced Life.

- In conjunction with the University of Pittsburgh School of Medicine, the Department of Neurological Surgery completed its first annual pre-clinical elective course for medical students. The course, led by Ray Sekula, MD, and resident Michael McDowell, MD—in conjunction with University of Pittsburgh Neurosurgery Interest Group leaders Jani Ronak and Alexandra Sansosti—provided medical students with the opportunity to learn more about the field through a variety of lectures and hands on activities.

March 2017
- Peter Gerszten, MD, was elected to The Radiosurgery Society’s board of directors.

- R. Mark Richardson, MD, PhD, was appointed to the Parkinson’s Foundation Western Pennsylvania board of directors.

- David Okonkwo, MD, PhD; Gregory Weiner, MD; and David Salvetti, MD, were featured in a Pittsburgh City Paper article that discussed the use of music in the operating room.

- Vincent Miele, MD, was named sports medicine editor for World Neurosurgery.

- Nitin Agarwal, MD, was appointed to the American Association of Neurological Surgeons Young Neurosurgeons Committee. Dr. Agarwal was also appointed to serve on the AANS Political Action Committee.
April 2017

- L. Dade Lunsford, MD, was featured in a UPMC television commercial that showcased the successful treatment of an acoustic neuroma patient.

- Twenty University of Pittsburgh neurosurgeons were named among this area’s top doctors in their field in a national survey published locally in Pittsburgh Magazine. The list included Daniel Bursick, MD; Matt El-Kadi, MD, PhD; Johnathan Engh, MD; Juan C. Fernandez-Miranda, MD; Robert Friedlander, MD; Paul Gardner, MD; Peter Gerszten, MD; D. Kojo Hamilton, MD; Brian Jankowitz, MD; Adam Kanter, MD; L. Dade Lunsford, MD; Joseph Maroon, MD; Edward A. Monaco III, MD, PhD; John Moossy, MD; Ajay Niranjan, MD; David Okonkwo, MD, PhD; Ian Pollack, MD; R. Mark Richardson, MD, PhD; Raymond Sekula, MD; and Elizabeth Tyler-Kabara, MD, PhD.

- The Department of Neurological Surgery—along with the University of Pittsburgh School of Medicine, UPMC and The Jannetta Society of The Jannetta Neuroscience Foundation—hosted the highly-successful inaugural Peter J. Jannetta Symposium, honoring the late neurosurgical icon. The symposium highlighted the history and future of innovations in the field of neurological surgery. The day-long event featured more than two-dozen lectures in five separate sessions and was attended by more than 120 neurosurgeons and residents. (See photos on page 58-59.)

- Pittsburgh Magazine featured an epilepsy patient treated by R. Mark Richardson, MD, PhD, in its Best Doctors in Pittsburgh issue. Karen Kurtz talked about how new 3D brain mapping technology utilized by Dr. Richardson helped change her life.

- The University of Pittsburgh resident team of Ezequel Goldshmidt MD, PhD; William Ares, MD; Michael McDowell, MD; and Jeremy Stone, MD, finished second nationally at the American Association of Neurological Surgeons Top Gun surgical completion held at the organization’s annual scientific meeting in Los Angeles. In addition, Dr. McDowell won gold in the lumbar pedicle screw placement individual event.

- A surgical demonstration case for a complex pituitary tumor, performed by Juan Fernandez-Miranda, MD, and Eric Wang, MD, at the National Skull Base Conference and Hands-on Anatomy Course at Tangdu Hospital in Xi’an, China, attracted more than 20,000 online viewers. The case was discussed extensively in the Chinese social medical network.

May 2017

- Brian Jankowitz, MD, was featured in a Pittsburgh Post-Gazette article that reported on the ENRICH (Early minimally invasive Removal of Intra-Cerebral Hemorrhage) stroke trial looking into the first treatment of hemorrhagic stroke.

- Sameer Agnihotri, PhD, received the Marlene Reimer Brain Star of the Year award by the Canadian Institutes of Health Research.

- Nitin Agarwal, MD, won the first place Socioeconomic Epster Award at the 2017 American Association of Neurological Surgeons Scientific Meeting for his abstract An Assessment of Medical Malpractice Litigation in Neurosurgery.

June 2017

- Ray Sekula, MD, received the University of Pittsburgh’s Allen Humphrey Excellence in Mentoring Award.
Department Overview

Accomplishments and Highlights of Note

• An article appearing in the November 2016 issue of the medical journal *Neurosurgery* dealing with the outcomes of operative and nonoperative treatment of adult spinal deformity, coauthored by department spine expert D. Kojo Hamilton, MD, was selected by the Congress of Neurological Surgeons as runner-up in the organization’s inaugural paper of the year awards.

• The Pittsburgh chapter of the Saints and Sinners Club of America selected Joseph Ma-roon, MD, as their 2017 Man of the Year. Past man-of-the-year honorees have included Arnold Palmer, Art Rooney, Rocky Bleier and Stan Musial.
**Future Initiatives**

**Jeffrey Balzer, PhD**  
Associate Professor  
Director, Clinical Services, Center for Clinical Neurophysiology  
Director, Cerebral Blood Flow Laboratory

Dr. Balzer and his investigative colleagues have validated their ability to classify SAH patients via their cerebrovascular reactivity status and will now begin to utilize this metric as a means by which to stratify treatment. This will be done in conjunction with continued CSF collection and biomarker indexing in this complex patient population.

**Johnathan Engh, MD**  
Associate Professor  
Director, Neuroendoproct Surgery Program  
Director, Adult Neurosurgical Oncology

Progressive downsizing and refinement of equipment for dilatable port surgery, leading to burr hole approaches for selected brain tumors (i.e. tumor removal without a craniotomy).

**Paul A. Gardner, MD**  
Associate Professor  
Executive Vice Chair, Surgical Services  
Neurosurgical Director, Center for Cranial Base Surgery

1) Chordoma exome sequencing data will be evaluated using new data analysis algorithms. This has the potential to create more accurate and rapid analysis of patterns of genetic derangement which can lead to new targets for therapy.

2) Dr. Gardner will continue a prospective application of the chordoma molecular prognostication panel to a larger cohort with evaluation of the success of the proposed management algorithm.

3) Dr. Gardner will continue work on extracellular matrix gel with the hope of bringing it to clinical trials soon.

4) Continued enrollment and analysis of ICG endoscopic angiography will be performed by Dr. Gardner to determine the role of this technique in distinguishing tumor tissue from normal tissue. Also, Dr. Gardner will perform a wider evaluation of vascularized reconstructive flap perfusion.

**Peter C. Gerszten, MD, MPH, FACS**  
Peter E. Sheptak Professor  
Vice Chair, Quality Improvement  
Director, Percutaneous Spine Service

Dr. Gerszten will continue his translational research investigations into the use of radiosurgery for extracranial neuromodulation. Studies will be performed that include the development of techniques to deliver high dose radiosurgery to the dorsal root ganglion in larger animal models. Clinical as well as histological examinations will determine the effects of this treatment with the goal of eventually being able to use these techniques to treat patients with disabling pain conditions.
Dr. Gerszten’s clinical research will continue to focus on the careful evaluation and expansion of minimally invasive spinal surgical techniques such as percutaneous sacroiliac fusions and zero-profile anterior cervical fusion devices. Not only will the clinical outcomes of patients who undergo percutaneous sacroiliac fusions be analyzed, but the timing of intervention and indications for such procedures will be further explored and clarified.

Dr. Gerszten will serve as a member of the United States Panel for Appropriate Management of Osteoporotic Vertebral Compression Fractures. This independent twelve member panel comprising neurosurgeons, orthopedic surgeons, radiologists, and pain management physicians from throughout the country will meet on a regular basis to help set national policy for the best management practices for patients with vertebral compression fractures.

In his role as vice chairman for quality improvement for the Department of Neurological Surgery, Dr. Gerszten is leading several important initiatives to improve patient care. The Department already has had significant success in improving the quality of neurosurgical care provided to its patients, including reductions in the numbers of surgical site infections as well as venous thromboembolic events. A major focus this year will be to reduce the number of unplanned readmissions for patients who have undergone inpatient neurosurgical care. Dr. Gerszten will oversee a comprehensive and multi-disciplinary approach to this initiative with the goal of improving patient care and clinical outcomes, decreasing morbidity, and improving patients’ satisfaction.

Diane L. Carlisle, PhD
Assistant Professor

Using the data generated on altered mitochondrial function of ALS motor neurons as compared with controls, Dr. Carlisle plans two projects. First, she plans to investigate the pathogenic mechanism that leads to mitochondrial dysfunction. Second, she plans to use the mitochondrial outcome as a readout for neuronal health in drug screening studies to try to find small molecule drugs that can restore mitochondrial function of ALS motor neurons.

Matt El-Kadi, MD, PhD
Clinical Professor
Vice Chair
Chief, Neurosurgery, UPMC Passavant
Director, UPMC Passavant Spine Center

Dr. El-Kadi’s future goals are to examine patient factors associated with infection more closely, possibly focusing on case-controlled analysis. Data is also currently being compiled regarding postoperative blood transfusion and length of stay.

Ajay Niranjan, MD, MBA
Professor
Director, UPMC-Brain Mapping Center (MEG)
Associate Director, Center for Image-Guided Neurosurgery
Director, Radiosurgery Research

Dr. Niranjan’s future research initiative includes a clinical trial of modified Gamma Knife radiosurgery dose planning for cerebral arteriovenous malformations (AVMs). The goal of this project is to design a radiosurgery dose plan in which a higher volume of AVM nidus is covered with a higher margin dose. The hypothesis is that the higher radiation dose delivered to a higher volume of nidus will result in improved obliteration rates of AVMs without any significant change in morbidity.
Ian F. Pollack, MD  
*A. Leland Albright Distinguished Professor  
Vice Chair, Academic Affairs  
Chief, Pediatric Neurosurgery  
Co-Director, Neurosurgical Oncology*

In the coming year, Dr. Pollack will continue his intramurally and extramurally funded programmatic efforts on molecular characterization of childhood brain tumors, implementation of molecularly targeted therapy, and application of immunotherapeutic strategies in the treatment of pediatric brain tumors.

Daniel R. Premkumar, PhD  
*Research Assistant Professor*

A hallmark of cancer is the ability of malignant cells to evade apoptosis. In Dr. Premkumar’s in vitro models, overexpression of anti-apoptotic BCL-2 family members renders cancer cells resistance to multiple classes of anticancer drugs, including receptor tyrosine kinase inhibitors, DNA-damaging agents, and nucleoside analogs. Because targeted therapies can be extremely powerful when implemented against the right cancers, Dr. Premkumar’s laboratory is largely focused on improving targeted therapies in genetically-defined subsets of glioma.

Nilkantha Sen, PhD  
*Associate Professor*

Dr. Sen has initiated studying the correlation between Alzheimer’s disease and TBI. Several other groups have shown that TBI leads to an accumulation of amyloid plaques in the brain and accelerate the process of neurodegeneration. As a part of the mechanism, Dr. Sen will test whether the oxidative/nitrosative stress and an activation of other kinases contribute to the amyloid plaque formation following TBI.

Mingui Sun, PhD  
*Professor*

1) Dr. Sun’s lab will be one of multinational research labs from the University of Pittsburgh, Imperial College in UK, University of Newcastle in Australia, University of Alabama, University of Colorado, Baylor School of Medicine, and Boston University to initiate a large-scale study of diet and dietary related behavior in underdeveloped countries in Africa and Southeast Asia. This research project will be funded by the Bill and Melinda Gates Foundation.

2) Dr. Sun expects to receive a competitive renewal of a grant from the National Institutes of Health to continue our exiting research project (now is the tenth year) on wearable devices for objective evaluation of diet, physical activity, lifestyle and behavior.

Fang-Cheng (Frank) Yeh, MD, PhD  
*Assistant Professor  
Technical Director, High Definition Fiber Tracking Laboratory*

1) Whole slide imaging analysis tool (WS Recognizer)

Dr. Yeh is collaborating with Liron Pantanowitz, MD, the director of the pathology informatics group at UPMC Shadyside, to start a new initiative that integrates MRI with pathology imaging analysis. This initiative will develop a tool, WS-Recognizer, which is an open-source...
pathology tool that uses whole slide image to recognize stains in the slides and present meaningful information. While traditional pathology is often limited by a field of view and may be biased due to its qualitative nature, the model pathology is moving toward quantitative analysis that adopts an automatic way to recognize the whole pathology slides. WS-Recognizer is a tool that allows users to retrieve pathology information and present it as a panoramic view of the tissue characteristics across the entire tissue section.

2) 3D scan of cadaveric brain

Dr. Yeh plans to conduct microdissection of 78 white matter pathways and examine their branches and connection routes. This task is based on a unique microdissection method that utilizes a neurosurgery microscope to perform dissection at a mesoscale resolution. Juan Fernandez-Miranda, MD, a co-investigator on the project, and his neuroanatomists will conduct extensive microdissection studies on 50 human cadaver brains. Completing this project will provide neuroanatomical evidence on major white matter pathways and improve the accuracy of the tractography atlas. In addition to the atlas validation, Dr. Yeh will also release an image database of our microdissection figures to benefit future neuroanatomy studies.
Gamma Knife Radiosurgery for Brain AVMs

Center for Image Guided Neurosurgery at UPMC

L. Dade Lunsford MD,
Hideyuki Kano, MD, PhD, Ajay Niranjan, MD, MBA, Edward Monaco, MD, PhD, John C. Flickinger, MD,
Educational Programs

The Department of Neurological Surgery provides medical education in a wide variety of forums at UPMC and the University of Pittsburgh. The faculty contributes to undergraduate and graduate-level education at both sites and to the continuing education of their professional colleagues.

Undergraduate Level
Selected faculty of the Department of Neurological Surgery participate in several undergraduate courses at the University of Pittsburgh. In addition, undergraduate students are offered shadowing opportunities with various faculty members while they evaluate and operate on patients at UPMC. To qualify undergraduate students obtain faculty permission and complete on line training courses related to patient confidentiality.

Medical Students
Faculty participate in teaching clinical neuroscience and neuroanatomy to first- and second-year medical students. Several Pitt medical students spend elective time doing clinical research with faculty members from various centers in the department. During their surgery core clerkship, third-year medical students may elect to take a two-week introductory subspecialty experience in neurosurgery.

Selective fourth-year medical students at the University of Pittsburgh, as well as visiting medical students from other schools, may elect to take a four-week clinical subinternship on the neurosurgery services at UPMC, during which they participate in all phases of the training program as well as in supervised patient care services. Typically each four-week rotation includes experience on cranial, spinal, and pediatric neurosurgery.

• Visiting Medical Students
The Department of Neurological Surgery at the University of Pittsburgh Medical Center offers a clinical elective that is open to enrolled fourth-year medical students in good academic standing at any U.S. medical school.

Elective rotations are four weeks in length and must correspond with the School of Medicine’s dates. The application requests will begin in February of each year. Assignments will be made after our fourth-year students finalize their schedules at the end of March. Once the student affairs office verifies each application, they will forward the application to the department. Reviewing of applications will start mid-April.

One-month clerkships offered to senior medical students from other medical schools attract 10-20 students each year. In their senior year selective students may participate in ongoing research projects in the Department of Neurological Surgery under the supervision of an advisor. This experience trains students in basic or clinical neurosurgical research techniques and procedures and offers in-depth education in basic neurosciences. Other medical students seek a more formal and longitudinal exposure to neurosurgical investigation, and complete an approved scholarly project. Pitt medical students often use this educational opportunity as the base for their required graduation scholarly project.

• Pitt Med Neurosurgery Interest Group
The Neurosurgery Interest Group at the University of Pittsburgh School of Medicine is devoted to fostering an interest in the exciting field of neurological surgery. The group connects medical students to key resources in the Department of Neurological Surgery and provides opportunities to shadow, conduct cutting-edge research, and network with the department.
Educational Programs

The group holds several talks throughout the year dedicated to various aspects of neurosurgery including neurotrauma, deep brain stimulation, and neuro-oncology. Those interested in neurosurgery are encouraged to participate in events and attend meetings.

Graduate Students

The Department of Neurological Surgery offers a graduate-level experience in the use of advanced computer techniques in biological research. A course in bioengineering systems, offered to University of Pittsburgh first-year graduate students in electrical engineering, is also taught by department faculty. Various faculty participate in the training of masters-level physician assistants from Chatham University.

Residency Program

The UPMC Department of Neurological Surgery offers a seven-year (PGY 1-7) residency program that is internationally renowned as a training ground for exceptional neurosurgeons. Accredited by the UPMC Graduate Medical Education Council, as well as the Accreditation Council on Graduate Medical Education (ACGME), the program is currently approved to train 28 residents, four each year. The goal of the program is to provide exceptional clinical and scientific education to top-notch graduates of medical schools who wish to be future leaders in the field of neurological surgery. The program focuses on training to maximize medical knowledge, build patient care skills, and provide for practice based and systems based learning. The department stress professionalism and interpersonal and communication skills, and relies heavily on both inpatient and outpatient use of informatics.

The University of Pittsburgh Department of Neurological Surgery was founded more than 75 years ago with a strong commitment to patient care, education and research. Today, the department is the largest neurosurgical academic provider in the United States, performing over 7,000 major procedures annually at UPMC academic hospitals and nearly 8,000 system wide.

A 2015 study published in the Journal of Neurosurgery showed that our department ranked among the top five neurosurgical residency programs in the country in terms of academic publishing output of faculty. Another Journal of Neurosurgery article, published in 2011, showed that our department ranked as the most productive residency program in the nation in terms of graduates remaining and contributing in academic neurosurgery. Still another article, published in informaHealthcare, showed that our stereotactic research effort was the most productive in the world.

Recently the department completed a 50-year retrospective assessment of training at our program. In each decade, beginning in 1971, we looked at admitted residents and finishing residents, tracking any changes in professional or behavioral events during training. We surveyed 98 graduates and are analyzing the data in 76% who completed the survey. This study does not indicate that residents have changed in any significant way over these 50 years. The vast majority of resident graduates express satisfaction with their career choice and its overall positive impact on their families.

Almost eighty years at the forefront of neurosurgical care have demonstrated that we are a proven international leader in patient care, research and training.

• PGY-1

Residency training at the department begins with the first year experience. PGY-1 residents who enter the field as novices in neurosurgery will spend a total of six months on critical care medical services (trauma, neuro, surgical ICU), and one month each on
Educational Programs

stroke neurology, trauma, and emergency room services. Finally they will spend three months on the neurosurgical trauma service. This revision and intensification is designed to prepare residents for full integration into the neurosurgery service as PGY 2 residents.

• PGY-2
The PGY-2 year represents an in depth introductory year to clinical neurosurgery and emphasizes critical care, basic operative techniques, and initial clinical decision making. The department emphasizes the importance of the flow of information and communication between residents, senior residents and responsible faculty. PGY-2 residents routinely spend a block of three months on the cranial service, three months on the spine service, three months on the pediatric service (Children’s Hospital of Pittsburgh of UPMC) and three months on the trauma service.

Most junior residents participate in more than 250 neurosurgical procedures during their first year. PGY-2 residents will complete basic training in many procedures, such as lumbar puncture, external ventricular drain placement, intracranial pressure monitor insertions and placement of cerebral blood flow technologies such as Licox tissue oxygenation monitors. Initial case experience includes the selection and identification of patients who will undergo craniotomy, routine spinal procedures and trauma cases.

Clinical judgment is enhanced by spending an average of one day per week in the physician outpatient office. Numerous midlevel providers, including physician assistants and nurse practitioners, provide support both on the hospital floors and in the outpatient clinics.

• PGY-3
The PGY-3 year emphasizes clinical experience in vascular neurosurgery (an initial introduction to endovascular and exovascular techniques), neuropathology and image-guided surgery (including stereotactic radiosurgery and functional neurosurgery) and neuro-oncology at UPMC Shadyside.

During the PGY-3 year, residents have a greater opportunity to consolidate their knowledge and to maximize supplemental reading and clinical reviews in preparation for a practice run of the written board examination (American Board of Neurological Surgery). This test is taken for practice in March of the PGY-3 year. Attendance at a training course in stereotactic radiosurgery, as well as initial experience in movement disorder, pain surgery and neuro-oncological surgery are obtained during this year. Each Fall PGY-3 residents also attend the annual Research Update in Neuroscience for Neurosurgeons (RUNN) course at Woods Hole, Mass. This course provides an update on exciting developments in neuroscience and is intended to catalyze residents to pursue neuroscience basic or clinical research.

• PGY-4
In the PGY-4 years, senior residents in neurological surgery will gain additional critical experience in multiple cranial and spinal cases in order to reach the next set of milestones in their education. Consolidation of medical knowledge, enhanced patient care skills and intense practice-based learning will occur in this year. PGY-4 residents spend a significant portion of their time in the operating room. Increasingly difficult procedures are assigned to senior residents and include complex spinal procedures with instrumentation, craniotomies for intra-axial tumors, meningiomas and posterior fossa surgery. Residents spend eight to nine months on the adult service and three to four months as senior resident on the pediatric service. Typically a senior resident participates in between 400 and 500 cases per year.
Educational Programs

• PGY-5/6
The PGY-5 and PGY-6 blocks provide a total of 18-24 months of focused career development opportunities for senior residents. During this time, residents will spend between three and four months as the chief resident at the VA Pittsburgh Healthcare System where they will gain additional surgical and service management skills. During this time residents take the ABNS training exam for credit. All residents must pass the exam in order to graduate. The departmental target goal is a performance on the written boards at or above the 50th percentile.

The remaining block of time is designed for residents to actively pursue research-focused subspecialty training, along with clinical investigation on topics that will eventually foster their subsequent career and provide benefit to the future course of neurosurgery. There are two paths for trainees in the PGY-5 and PGY-6 years: the Clinical Investigator Path and the Surgeon Scientist Investigator Path:

Clinical Investigator Path:
The clinical investigator path includes an 18-month period of time during the PGY-5 and PGY-6 year for focused subspecialty training. Residents must identify a primary mentor during the PGY-4 year. The resident in this path must have identified a clinical subspecialty focus that will supplement career development and submit an internal funding grant request (Copeland Grant) on a clinical topic. The resident must complete and submit four to six publications in peer-reviewed journals during this interval of time. Residents also will participate in the Clinical and Translational Science Institute (CTSI) Seminar Series. Residents are expected to present at the AANS (American Association of Neurological Surgeons), CNS (Congress of Neurological Surgeons) or subsection meetings relative to their clinical or scientific work.

Surgeon Scientist Investigator Path:
During this interval of time, residents have between 18-20 months to further develop an academic research career, working in a functional and dedicated laboratory. Residents must identify a primary mentor during their PGY-4 year. They are expected to submit a Copeland Grant during their PGY-4 year on their research topic of choice. Residents in this path are able to submit for a national grant using existing mechanisms from the AANS, CNS, foundations or industry. Residents are expected to submit four to six peer-reviewed journal articles during this time. Residents also will have the opportunity to gain a master of science degree but must begin this process one year in advance. Selected residents who wish to obtain a PhD will be fully evaluated for this opportunity but must dedicate additional blocks of training time after they complete the residency training in order to complete such an advanced degree. All residents are expected to present their work at one or more national scientific meetings. During their PGY-6 year, residents are freed from responsibility from both outpatient and operating room coverage, except for elective and approved moonlighting performed on the UPMC Presbyterian neurological surgery service.

The University of Pittsburgh provides a wide spectrum of faculty mentors and opportunities for research in neurosurgery, neurology, neuroscience, psychiatry, physical medicine and rehabilitation, neuro-imaging, neuropathology, bioengineering, public health, and regenerative medicine (McGowan Institute of Regenerative Medicine). Research may be funded from numerous sources, including the Walter Copeland Fund of the department (which is administered by The Pittsburgh Foundation). Residents in the department’s program have competed successfully.
Educational Programs

for AANS, CNS and American College of Surgeons grants. All residents are expected to write scientific papers and to supplement this with additional book chapters. Residents are expected to learn the principals of investigation under the supervision of faculty mentors.

Residents at all levels are expected to attend the departmental teaching conferences, which are mandatory. Neurosurgical knowledge is gauged by performance on written boards, as well as by semi-annual written evaluations and meetings. Each year a promotion to the next level of training is determined by the departmental competency review committee.

• PGY-7
PGY-7 residents return to the service as chief residents on the clinical service at UPMC Presbyterian. Coverage responsibilities include chief of the cranial service, the spinal service and the trauma service. On average, chief residents perform 400-500 major cases during PGY-7, such as clipping of aneurysms, skull-based tumors, complex spine surgery, and posterior fossa surgery. As future practitioners of neurosurgery, they also learn responsibilities of clinical oversight of the service that they are leading. They serve as primary instructors to the younger residents. By the time of their completion of the chief year, residents often have performed more than 1500 neurosurgical procedures as monitored by the ACGME online Accreditation Data System (ADS) database.

• General
Residents in this program have a particularly unique experience in microneurosurgery, pediatric, endoscopic, and image-guided neurosurgery including radiosurgery. In addition to daily teaching rounds, led by individual members of the department faculty, the department holds a series of weekly resident conferences and review lectures to discuss specific neurosurgical concepts, techniques, problems and solutions. Both faculty and residents are regular participants in these programs, many of which include formal didactic presentations. The training program includes the following faculty/resident conference:

- Multidisciplinary Brain Tumor Board (weekly)
- Chairman’s Conference (twice monthly)
- Faculty Teaching Conference (weekly)
- Image-Guided/Radiosurgery Conference (weekly)
- Written Boards Preparation Conference
- Patient Care Conference (weekly)
- Pediatric Neurosurgical Conference (twice weekly)
- Pituitary Conference (quarterly)
- Residents’ Conference (weekly)
- Visiting Professor Series (four to six per year)

The chief residents present the weekly patient care conference. Each resident also presents one or more annual 30-minute lectures on basic neurosurgical topics or recent research. To teach the skills required for the oral boards, several conferences use a board-simulated approach to presented cases. At least four times per year, an internationally known neurosurgeon serves as a lecturer and visiting professor. The visiting professor also reviews interesting cases with the residents and attends a journal club.

Trainees have been extremely productive during their clinical and non-clinical years. They commonly have five to 10 publications in refereed journals and multiple presentations at national meetings by the completion of their residency.
Educational Programs

Since 1980, residents in the department have been awarded three Congress of Neurological Surgeons Preuss Awards for brain tumor research, two CNS clinical fellowships, American College of Surgeons research scholarships, the CNS Margot Anderson Foundation Fellowship in Brain Restoration Research, and two CNS Wilder Penfield Clinical Investigation Fellowships. Four residents have received the Van Wagenen Fellowship, a prestigious award given annually by the American Association of Neurological Surgeons to a North American neurosurgical resident who is graduating that year. At each annual meeting, residents and faculty often receive named awards for their abstract presentations. At the 2016 AANS annual meeting in Chicago residents and faculty together received a total of 19 named awards for their research and clinical accomplishments.

Given the extensive experience in microneurosurgery, skull base surgery, endovascular surgery, endoscopic surgery, and image-guided neurosurgery, many residents no longer require post residency fellowships and entered directly into academic or private practice. Residents who want to have a career focus in pediatric neurosurgery obtain prestigious fellowships at other institutions prior to beginning their neurosurgical careers.

Although the program’s focus is on training academic neurosurgeons interested in clinical and basic science research, it has produced many outstanding private practice neurosurgeons as well. Half of the department’s graduates in the last 25 years serve as full-time academic faculty members, and 25 percent have clinical affiliations with academic institutions.

• Neurosurgery Residency Special Features
The Department of Neurological Surgery at the University of Pittsburgh has created a unique environment where centers of excellence flourish. The goals are to provide outstanding neurosurgical patient care, to promote education, and to perform clinical and basic science research. This group of dedicated individuals, including faculty, residents, and staff, is one of the most productive departments in the world.

These accomplishments in both patient care and research have resulted in numerous publications. Each year, more than 200 refereed articles, abstracts, proceedings, book chapters, and books are published by this department. Special features include:

- Clinical and Laboratory Program for the Surgery of Cranial Nerve Disorders
- Comprehensive Spine Surgery Center
- Endoscopic Endonasal and Skull Base Surgery
- Frameless Stereotactic Equipment (multiple technologies)
- Magnetic Resonance Spectroscopy
- Microsurgical Laboratory
- Microelectrode Recording System
- Laboratory for the Development and Evaluation of New Surgical Techniques
- Two Gamma Knife Radiosurgical Suites (Perfexion and ICON)
- Spinal Radiosurgery (CyberKnife or TrueBeam)
- State-of-the-Art Neuroimaging:
  - CT and MRI angiography
  - High Definition Fiber Tractography
  - Functional MRI, MRS
  - Magnetoencephalography
  - PET
  - MR Research Center
- Intraoperative CT Imaging (Dedicated OR Suite)
Educational Programs

- Neurosurgery Residency Research Opportunities
  Comprehensive programs in basic science and clinical research are conducted by department faculty along with investigators throughout the university community. Current research projects include:

  Animal Models of Epilepsy
  Clinical and Basic Science Head Injury Program
  Computer-Image Integration into Surgical Planning
  Brain Tumor Research
  Intracranial Blood Flow and Saccular Aneurysm Formation
  Clinical Outcomes of Radiosurgery
  Research in Spinal Tumors and Spine Biomechanics
  Spasticity
  Stem Cells
  Studies on Cranial Nerve Disorders
  Teleradiography
  Viral Vectors in Tumor Management

  Basic science and clinical research projects are an integral part of department faculty and trainee activities. Most residents spend 18-24 months working on such projects. Local, regional and national peer-reviewed funding resources continue to grow and support productive basic and clinical research. Internal funding from the Walter Copeland Fund provides seed money for many unique and fascinating projects undertaken by residents and faculty. In many cases these projects subsequently receive extramural research funding.

  The coordinator of the department's medical education program is Melissa Lukehart. L. Dade Lunsford, MD, is the program's residency director.

  Each academic year ends with a formal farewell celebration. (See photos on pages 236-239.)

Teaching Awards
  Annual departmental teaching awards are given to the best faculty teacher (selected by the residents) and to the best resident teacher (selected by the staff). In 2016-17, the faculty award was given to Juan Carlos Fernandez-Miranda, MD. The resident honor was awarded to Zachary Tempel, MD.

Continuing Medical Education
  Department faculty take an active role in national and regional continuing education programs. Course presentations are given every year at the annual meetings of both the Congress of Neurological Surgeons and the American Association of Neurological Surgeons. In addition, physicians of several department centers provide institutional training to other physicians throughout the world.

Professional Courses
  *Principles and Practice of Gamma Knife Surgery*, detailing the practical aspects of stereotactic radiosurgery using the Leksell Gamma Knife, is co-directed by Drs. L. Dade Lunsford, John C. Flickinger and Ajay Niranjan. Principles of medical physics and radiobiology as they apply to single-session, focused, small-volume irradiation are covered. Patient selection techniques, didactic course presentations, and hands on computer skills are provided. More than 2000 professionals from across the world have been trained in more than 120 courses during the past 22 years. Course graduates are able to create radiosurgery dose plans for brain tumors, vascular malformations and trigeminal neuralgia. The week-long course is offered six times per year.
Educational Programs

The Center for Image-Guided Neurosurgery faculty and staff presents *Gamma Knife Radiosurgery Training for Nurses*, a basic training course geared for nurses and other allied health personnel. The course covers device management, patient preparation, patient education, neuroimaging and post-radiosurgery care related to the Gamma Knife.

*Minimally Invasive Endoscopic Surgery of the Cranial Base and Pituitary Fossa Course*, co-directed by Paul Gardner, MD, and Carl Snyderman, MD, MBA, teaches endoscopic surgery of the cranial base and pituitary fossa. Experts present technical aspects of those operations, along with risks, benefits and outcomes. Live cases and hands-on lab work are included in the course schedule. This course is designed for neurosurgeons, minimally invasive surgeons and other allied health professionals. The week-long course is presented three times a year.

*Innovations in Endoscopic Intracranial Surgery*, co-directed by Paul Gardner, MD, Juan Fernandez-Miranda, MD, and Johnathan Engh MD, is a comprehensive overview of the basic concepts of cranial endoscopy as well as multiple endoscopic and minimally invasive corridors of approach to all areas of the brain and skull base. The course combines 3D anatomical and didactic lectures with hands-on anatomical dissection, prosection and live interactive surgical cases.

*Principles and Practice of Intraoperative Neuromonitoring*, co-directed by Partha Thirumala, MD, and Jeffrey Balzer, PhD, is designed for advanced professionals who perform or support intraoperative neuromonitoring (IONM) procedures. The course highlights practice specifications, multimodality protocols, recent advances in the field, pre-/post-operative neurological evaluation, and telemedicine in IONM.

**Online CME**

Department faculty currently lecture in a number of online CME courses for physicians and other medical professionals. The following courses are available through UPMC Physician Services or through the University of Pittsburgh:

- Brain Stimulation: Overview
- Brain Stimulation Future Directions
- Controversies in Cranial Base Surgery
- Endoscopic-Assisted Retromastoid Approach
- Endoscopic Endonasal Approach: Crista Galli to the Dens (Sagittal Plane)
- Endoscopic Endonasal Approach in the Pediatric Population
- Endoscopic Endonasal Pituitary Surgery
- Gamma Knife Radiosurgery for Acoustic Neuromas: Treatment Options
- Immunotherapy for Brain Tumors
- Radiosurgery and Cranial Base Surgery
- Radiosurgery for Pituitary Surgery (Part 2): Stereotactic Radiosurgery for Endocrine Active Pituitary Tumors
- Vertebral Body Compression Fractures: Interventional Management Strategies

**Speakers Bureau**

The department has a speakers bureau service available for organizations interested in keeping abreast with the latest advances and techniques in the field of neurological surgery. This service is promoted through the University of Pittsburgh’s Center for Continuing Education and UPMC’s Office of Physician Relations, as well as through the department website.
Educational Programs

The ultimate goal of the speakers bureau is to enhance education of current management of neurosurgical disorders at area hospitals and to help area physicians—and the community in general—become more aware of the services and advanced care available at the University of Pittsburgh Department of Neurological Surgery. Some of the speakers available for this service include Drs. Robert Friedlander, Peter Gerszten, Adam Kanter, L. Dade Lunsford, Joseph Maroon, David Okonkwo, Ian Pollack, Elizabeth Tyler-Kabara, Mark Richardson, Ray Sekula Jr. and others. Speakers cover a wide variety of subjects from brain and spine surgical techniques to cancer research.

Stuart Rowe Society Lectureship and Research Day
On October 19, 2016, the department hosted the 12th annual Stuart Rowe Society Lectureship and Research Day. The event is intended to showcase research activities in the field of neurological surgery and provide a forum for discussion.

During this day, a series of talks are presented by department residents, each spotlighting a topical research issue relevant in the field. These talks are followed by discussion, moderated by a special honored visiting professor prominent in the field of neurosurgery. The 2016 honored guest was Andres Lozano, MD, PhD, professor and holder of the Dan Family Chair in Neurosurgery and the RR Tasker Chair in Functional Neurosurgery at the University of Toronto.

The visiting professor also selects a “best presentation” award, presented later in the evening at a special dinner and reception. For 2016, PGY-6 resident Georgios A. Zenonos, MD, received the best presentation award for his talk, “The Genetic Landscape of Clival Chordoma.” PGY-6 resident Gregory Weiner, MD, received the runner-up award for his presentation “Limitations of the 64 Channel Multidetector Computerized Tomography Angiography for Diagnosis of Blunt Cerebrovascular Injury.” It was the second year in a row that Dr. Weiner was honored with the second place award.

Stuart Rowe Day honored guest lecturer Andres Lozano with department chairman Robert Friedlander and residents.
This spotlight on research was a principle first emphasized by Stuart Niles Rowe, MD, the first formally-trained neurosurgeon to practice in Pittsburgh. Rowe is widely considered the founding figure of neurosurgery training in the city, establishing the base of what would later become the University of Pittsburgh Department of Neurological Surgery.

Rowe believed that neurosurgery training should not only teach exceptional technique, but also the critical clinical decision-making skills necessary to succeed. He preached the underlying need for thorough literature review and independent research as a means for broadening clinical knowledge.

**Peter J. Jannetta Symposium**

The inaugural Peter J. Jannetta Symposium was held April 8, 2017, at the Hotel Monaco in downtown Pittsburgh. The event was a wide-ranging look at the innovations taking place in the field of neurosurgery, as well as a celebration of the accomplishments of Peter J. Jannetta, MD—innovative former chairman of the University of Pittsburgh Department of Neurological Surgery who passed away in April of 2016.

Prominent figures in the field of neurosurgery, including Stephen Haines, MD; Hae-Dong Jho, MD, PhD; Bruce Pollack, MD; Laligam Sekhar, MD; Chandra Sen, MD; Gregory Thompson, MD; and Howard Yonas, MD, joined department leaders Robert Friedlander, MD; Paul Gardner, MD; L. Dade Lunsford, MD; David Okonkwo, MD, PhD; Ian Pollack, MD; and Ray Sekula, MD, among others, to discuss the latest advances in skull base surgery, microvascular decompression, vascular surgery, endovascular surgery, radiosurgery and spine surgery.

The day-long event featured over two-dozen lectures in five separate sessions and was attended by more than 120 neurosurgeons and residents.
Inaugural Peter J. Jannetta Symposium

Lecture room in Hotel Monaco. The day-long event attracted more than 120 attendees.

Gregory Thompson speaks on innovations in stroke care. Dr. Thompson was one of more than two dozen speakers at the event.

The symposium was divided into five sections, with five to six speakers per section. Howard Yonas served as moderator of the vascular section.

Speakers Alan Scarrow, Brian Jankowitz and Elad Levy.

Department chairman Robert Friedlander (r) with Rudolf Falhbusch and Diana Jannetta.

Speakers Paul Nelson, A. Leland Albright and Stephen Haines.
Department chairman Robert Friedlander speaks with residents and guests during pre-dinner reception.

Rudolf Falhbusch, Chandranath Sen and David Zorub.

Hae-Dong Jho, Laligam Sekhar and Robert Friedlander.

Mark McLaughlin was one of several guests providing personal remarks after dinner on experiences with Peter Jannetta.

Some of the symposium’s speakers and guests gather for post dinner group photo.
Educational Programs

Dr. Jannetta served as chairman of the University of Pittsburgh Department of Neurological Surgery for 25 years beginning in 1971. He was internationally acclaimed for his development of microvascular decompression (MVD), an innovative procedure that moved blood vessels away from the trigeminal nerve, alleviating chronic pain and spasms in facial muscles. The procedure became commonly known as the 'Jannetta Procedure' and brought relief to thousands.

Dr. Jannetta went on to publish more than 400 scientific articles, abstracts and book chapters and won several awards for his contributions to the field. Perhaps more importantly, he helped create one of the most outstanding schools of neurosurgery in the world, training scores of residents, many of whom have gone on to be leaders in the field themselves.

The symposium was hosted by UPMC, the University of Pittsburgh School of Medicine and the Department of Neurological Surgery. The presenting sponsor for the event was The Jannetta Society of The Jannetta Neuroscience Foundation.

Other Postgraduate Education
The Department of Neurological Surgery participates in the education of house staff of other departments, including surgery, neurology, medicine (endocrinology) and emergency medicine. Educational endeavors include neuroscience conferences, general lectures on neurosurgical topics, and grand rounds. In addition, faculty takes part in the Department of Surgery’s Vascular Surgery Conference and provides speakers for the Critical Care Medicine Lecture Series.

Neurocirugía en UPMC
The Department of Neurological Surgery maintains a Spanish-language website at upmc.com/Services/neurosurgery/spanish/Pages/default.aspx to serve, educate and provide important information for Spanish-speaking visitors.
Faculty Biographies
Faculty Biographies

Adnan A. Abla, MD
Clinical Professor

Adnan Abla, MD, completed his neurosurgical residency training at the Medical College of Pennsylvania and at the University of Oklahoma. To obtain cross-training in spinal instrumentation, he completed a year in the orthopedic residency program at the University of Oklahoma. He also completed a clinical fellowship at Allegheny General Hospital. He is certified by the American Board of Neurological Surgery and the American College of Surgeons. Dr. Abla served as an associate professor of neurosurgery at Allegheny University of the Health Sciences in Pittsburgh, PA, as well as the director of spine services for Allegheny General Hospital. He is a clinical professor of neurosurgery at the University of Pittsburgh School of Medicine. Dr. Abla specializes in the treatment of complex spine disorders including spinal instrumentation and tumors. He has co-authored 12 book chapters, and has published 40 articles. He is an active participant in multiple professional and scientific societies. Dr. Abla retired from practice in March of 2017.

Sameer Agnihotri, PhD
Assistant Professor

Sameer Agnihotri, PhD, joined the faculty of the Department of Neurological Surgery at Children’s Hospital of Pittsburgh of UPMC in November of 2016. Dr. Agnihotri graduated from the University of Toronto in 2005 with a bachelor of science honors degree in biology, specializing in genetics. He earned his PhD in medical biophysics in 2011 from the University of Toronto where he used genetic screens to identify novel drivers of glioblastoma, an incurable brain tumor. He subsequently completed his post-doctoral fellowship at the Arthur and Sonia Labatt Brain Tumor Research Centre at the Hospital for Sick Children, in Toronto, and the Princess Margaret Cancer Centre, Division of Neuro-oncology Research, also in Toronto.

Specialized Areas of Interest
Pediatric and adult high-grade gliomas.

Professional Organization Membership
Society of Neuro-Oncology
Children’s Brain Tumor Tissue Consortium (CBTTC)

Education & Training
BSc, (hons), Biology, University of Toronto, 2005
PhD, Medical Biophysics, University of Toronto, 2011
Fellowship, Hospital for Sick Children, Toronto, 2016
Fellowship, Princess Margaret Cancer Centre, Toronto, 2016

Editorial Service
• Editorial Board:
  Archivum Immunologiae et Therapiae Experimentalis
  Translational Neuroscience

• Ad HocReviewer:
  Neuro-oncology

Professional Activities
Scientific Committee: Children’s Brain Tumor Tissue Consortium (CBTTC)
Honors and Awards
Children’s Trust and Children’s Hospital of Pittsburgh Young Investigator Award, 2017
Marlene Reimer Brain Star Award, 2016
Post-Doctoral Scholarship, Canadian Institute of Health Resources (CIHR), 2013-16
Trainee of the Year, Hospital for Sick Children, 2014
Young Investigator Award in Basic/Translational Research, Canadian Neuro-Oncology, 2014
Lucien J. Rubinstein Award, American Brain Tumor Association, 2013
Wolfgang Vogel Memorial Award, University of Toronto, 2013
Young Investigator Travel Award, Society of Neuro-Oncology, 2012
Graduate Student Scholarship, Ontario Institute for Cancer Research, 2009
Young Investigator Award in Pediatric Brain Tumour Research Awarded, Pediatric Brain Tumor Research Foundation, 2007

Publications: 2016-17
• Refereed Articles:

• Presentations:

Invited Lectures: 2016-17
• Local/Regional:
Nduka Amankulor, MD
Assistant Professor
Associate Director, Adult Neurosurgical Oncology

Nduka Amankulor, MD, a specialist in the surgical treatment of complex brain and spine tumors, joined the Department of Neurological Surgery in June of 2012. Dr. Amankulor received his medical degree and neurosurgical training from the Yale University School of Medicine. He then completed a clinical fellowship in neurosurgical oncology at Memorial Sloan-Kettering Cancer Center in New York. In addition to his clinical practice, Dr. Amankulor is a cancer biologist who is studying the biological underpinnings of gliomas and metastatic brain tumors.

Specialized Areas of Interest
Surgical treatment of complex brain and spine tumors.

Hospital Privileges
UPMC Hamot
UPMC Mercy
UPMC Presbyterian
UPMC Shadyside

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Society for Neuro-Oncology

Education & Training
BA, Philosophy, New York University, 1998
MD, Yale School of Medicine, 2004
Residency, Yale School of Medicine, 2011
Fellowship, Neurosurgical Oncology, Memorial Sloan-Kettering Cancer Center, 2012

Editorial Service
• Editorial Board:
  Frontiers in Radiation Oncology
• Ad Hoc Reviewer:
  Journal of Immunotherapy
  Journal of the National Cancer Institute
  Nature Communications, Microvascular Research
  Neurosurgery

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Research Executive Committee

Honors and Awards
Leo H. Criep Excellence in Patient Care Award, University of Pittsburgh, 2015
Best Oral Presentation Award, Tumor Biology Session, 20th Annual Scientific Meeting and Education Day of the Society for Neuro-Oncology (SNO), 2015
University of Pittsburgh Physicians Foundation Scholar, 2016
Faculty Biographies

Nduka Amankulor, MD

Publications: 2016-17
• Refereed Articles:


• Presentations:

Amankulor NM. “Genetic mechanisms of immune resistance in Glioma: Can we overcome them?” Pediatric Hematology/Oncology/BMT Division Conference, Children’s Hospital of Pittsburgh of UPMC, Pittsburgh, Pa., January 31, 2017.

Invited Lectures: 2016-17
• Local/Regional:


Jeffrey Balzer, PhD
Associate Professor
Director, Clinical Services, Center for Clinical Neurophysiology
Director, Cerebral Blood Flow Laboratory

Jeffrey Balzer, PhD, is director of clinical operations and staff clinical neurophysiologist at the Center for Clinical Neurophysiology and director of the Cerebral Blood Flow Laboratory at the University of Pittsburgh Medical Center. His current research interests range from the utilization of genetic biomarkers for the prediction of delayed cerebral ischemia in subarachnoid hemorrhage to the effects of exercise on arterial stiffness and cerebral blood flow. Dr. Balzer received his undergraduate education at the University of Pittsburgh, where he also pursued a graduate education and a PhD in behavioral neuroscience. He is also the secretary/treasurer of the American Board of Neurophysiological Monitoring and is on the board of directors of the American Society of Neurophysiological Monitoring. He has published 79 refereed articles and 15 book chapters.
Jeffrey Balzer, PhD

Specialized Areas of Interest
Intraoperative neurophysiological monitoring, subarachnoid hemorrhage, cerebral blood flow and effects of exercise on cerebrovascular function.

Board Certifications
American Board of Neurophysiological Monitoring

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
Excela Health System
Jameson Hospital
Monongahela Valley Hospital
UPMC Altoona
UPMC Hamot
UPMC Horizon
UPMC McKeesport
UPMC Mercy
UPMC Passavant
UPMC Presbyterian
UPMC St. Margaret's
UPMC Shadyside

Professional Organization Membership
American Clinical Neurophysiology Society
American Association for the Advancement of Science
American Society for Neurophysiological Monitoring (Fellow)
New York Academy of Sciences
Pittsburgh Neuroscience Society

Education & Training
BS, Behavioral Neuroscience, University of Pittsburgh, 1984
MS, Behavioral Neuroscience, University of Pittsburgh, 1989
PhD, Behavioral Neuroscience, University of Pittsburgh, 1994
Fellowship, Neurophysiology, University of Pittsburgh, 1994

Editorial Service
• Editorial Board:
The Neurodiagnostic Journal

• Ad Hoc Reviewer:
Analgesia and Anesthesia
Journal of Clinical Neurophysiology
Spine
World Neurosurgery

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
Co-Director, Neurosurgical Resident’s Basic Science Course
Co-Course Director, Principles and Practice of Intraoperative Monitoring, University of Pittsburgh Medical Center
• **University of Pittsburgh:**
  Course Director, Foundations of Clinical Neurophysiology, Department of Neuroscience

**Professional Activities**
Secretary/Treasurer, American Board of Neurophysiologic Monitoring
Board of Directors, American Society of Neurophysiological Monitoring

**Publications: 2016-17**

• Refereed Articles:


• Invited Papers:

• Book Chapters:

• Presentations:
Invited Lectures: 2016-17

• National:

• Local/Regional:

J. Brad Bellotte, MD
Clinical Assistant Professor
Chief, Neurosurgery, UPMC Hamot

J. Brad Bellotte, MD, is chief of neurosurgery at UPMC Hamot in Erie, Pa. He joined the University of Pittsburgh Department of Neurosurgery as a clinical assistant professor in July of 2011. Dr. Bellotte is a leading expert in complex spine surgery, including minimally invasive surgeries. He earned his medical degree from West Virginia University School of Medicine, and completed an internship in general surgery and a residency in neurosurgery at Allegheny General Hospital in Pittsburgh.

Specialized Areas of Interest
Complex spine surgery; brain surgery.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
UPMC Hamot

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons
North American Spine Society
Pennsylvania State Neurosurgical Society

Education & Training
MD, West Virginia University, 1999
Residency, Neurosurgery, Allegheny General Hospital, 2005

Honors and Awards
Orthopedic Teaching Award, UPMC Hamot, 2011-12
Jeffrey Bost, PA-C  
*Clinic Instructor*

Jeffrey Bost, PA-C, graduated with a BS in 1983 from Allegheny College and attended Community College of Allegheny County for his physician assistant degree. After working with a cardiology practice from 1985 to 1987 he joined Joseph Maroon, MD, and his Tri-State Neurosurgical Associates group at Allegheny General Hospital in June of 1987. In 1999, he and Tri-State moved to UPMC. He is a clinical instructor in the Department of Neurosurgery. He has 65 invited lectures, 55 national posters, 29 coordinated research projects, five workshops presentations, 35 refereed articles and 24 book chapters. He also co-wrote three books. Bost is also clinical assistant professor for Chatham College.

**Board Certifications**
- National Certification issued by NACCPA
- Medical Assistant License, State of Pennsylvania
- Medical Assistant License, State of Ohio

**Hospital Privileges**
- Heritage Sewickley Valley Hospital
- UPMC Passavant
- UPMC Presbyterian necessary

**Professional Organization Membership**
- American Academy of Physician Assistants
- American Association of Neurological Surgeons

**Education & Training**
- BS, Allegheny College, 1983
- PA, Community College of Allegheny County, 1985

**Media Appearances: 2016-17**

**Publications: 2016-17**
- **Books:**

Daniel M. Bursick, MD  
*Clinical Assistant Professor*

Daniel M. Bursick, MD, is clinical professor of neurosurgery at UPMC Mercy. His clinical interests include neurosurgical trauma, brain stem injuries, spinal neurosurgery, and the surgical treatment of pain. He received his medical degree from the M.S. Hershey School of Medicine at Pennsylvania State University in Hershey, Pa., completed his neurosurgical residency at the University of Pittsburgh Medical Center and received postgraduate fellowship training in neurosurgery at the National Hospital for Nervous Diseases in London. He is a fellow of the American College of Surgeons and a member of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons.

**Specialized Areas of Interest**
- Spine surgery, neurosurgical trauma, neuromodulation for pain.
Faculty Biographies

Daniel M. Bursick, MD

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Monongahela Valley Hospital
UPMC Mercy

Professional Organization Membership
Allegheny County Medical Society
American College of Surgeons
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Pennsylvania Neurological Society
Pennsylvania Medical Society

Education & Training
BS, Biology, University of Pittsburgh, 1972
MD, Pennsylvania State University, 1976
Residency, University of Pittsburgh, 1982
Fellowship, Neurology, National Hospitals for Nervous Diseases, 1982

Honors and Awards
Pittsburgh Magazine, Best Doctors, 2012-17

Diane L. Carlisle, PhD
Assistant Professor

Diane Carlisle, PhD, joined the Department of Neurological Surgery in October 2010. She received her undergraduate degree in molecular biology from Washington and Jefferson College and her graduate degree in molecular and cellular oncology from George Washington University where she identified new signaling pathways involved in occupational causes of lung cancer. Dr. Carlisle came to the University of Pittsburgh after a postdoctoral fellowship at Johns Hopkins University under the mentorship of Robert Casero Jr., PhD, in drug development for lung cancer. She then developed an independent research program using stem cells to investigate adult disease. The mission of her laboratory is to use human pluripotent stem cells to model disease. She has an active program using stem cells generated from tissue samples donated by sporadic ALS patients. By differentiating these cells into motor neurons, she is able to identify changes in mitochondrial function in ALS motor neurons. In addition, she uses stem cells as a developmental model to determine the molecular alterations in cell fate decisions caused by prenatal nicotine exposure, including dysregulation of the canonical WNT/NMYC axis. Furthermore, she uses her expertise in pluripotent stem cell methods and directed differentiation to collaborate in her department and across the university in cross disciplinary projects that use pluripotent stem cell technologies. In addition, she serves as faculty and course coordinator of the NIH-funded stem cell course, Frontiers in Stem Cells and Regeneration, which is held annually at the Marine Biological Laboratories in Woods Hole, Mass.

Specialized Areas of Interest
Fetal basis for adult disease; use of stem cells for developmental modeling and drug discovery; amyotrophic lateral sclerosis (ALS); chronic obstructive lung disease (COPD).

Professional Organization Membership
International Society for Stem Cell Research
Diane L. Carlisle, PhD

**Education & Training**
BA, Biology, Washington & Jefferson College, 1994  
PhD, Molecular and Cellular Oncology, George Washington University, 1999  
Fellowship, Johns Hopkins University, 2001

**Interdepartmental and Medical Center Activities**
• University of Pittsburgh:  
  Mentor, First Experiences in Research, University of Pittsburgh Dietrich School of Arts and Sciences

• Department of Neurological Surgery:  
  Journal club organizer

**Professional Activities**
FAMRI (Flight Attendants Medical Research Institute), Study Section  
NIH Cancer Etiology Study Section, Ad Hoc Member  
Faculty and course coordinator, Frontiers in Stem Cells and Regeneration Course

**Community Activities**
Judge, Puzzle-lympics, North Hills School District Elementary School

**Invited Lectures: 2016-17**
• National:  

---

Yue-Fang Chang, PhD

*Research Assistant Professor*

Yue-Fang Chang, PhD, joined the Department of Neurological Surgery as a research associate in June of 2000. She received her doctoral degree in statistics from the University of Illinois and master degree in epidemiology from the University of Pittsburgh. Dr. Chang has worked in a variety of areas, such as brain tumor, traumatic brain injury, health outcome, neuroimaging study, women’s health and diabetes epidemiology. She serves as the statistician in several epidemiological studies including Cardiovascular Health Study, Women’s Health Initiative and Study of Women’s Health Across the Nation. Over the years she has been involved in numerous grant preparations, providing statistical expertise in design, analysis and power/sample size calculations.

**Specialized Areas of Interest**
Longitudinal data analysis; survival analysis; statistical computing; research methodology; injury epidemiology.

**Education & Training**
BS, Statistics, National Chung-Hsing University, Taiwan, 1984  
MS, Statistics, University of Illinois at Urbana-Champaign, 1987  
PhD, Statistics, University of Illinois at Urbana-Champaign, 1991  
MPH, Epidemiology, University of Pittsburgh, 1994
Yue-Fang Chang, PhD

Faculty Biographies

**Publications: 2016-17**

- **Refereed Articles:**


**Donald J. Crammond, PhD**

*Associate Professor, Movement Disorder Surgery*

Donald Crammond, PhD, joined the Center for Clinical Neurophysiology as a staff neurophysiologist in November 1998. Dr. Crammond received his undergraduate education in physiology at the University of Glasgow in Scotland and his graduate education in neurophysiology at the University of Toronto. After postdoctoral studies at the University of Wisconsin and later at the Université de Montréal, he was appointed visiting associate scientist at the National Institute of Mental Health in Bethesda, Md. Dr. Crammond specializes in behavioral and systems-level neurophysiology, examining the neuronal substrates of higher cognitive processes such as movement planning and speech in and the functional interactions between, the cerebral cortex and basal ganglia, and the mechanisms underlying motor control and movement disorders. Dr. Crammond is the associate director for microelectrode recording and subcortical mapping for the Movement Disorder Surgery Program at UPMC. Dr. Crammond is the chairman of the American Board of Neurophysiologic Monitoring (ABNM).

**Specialized Areas of Interest**

The application of neurophysiological mapping in the surgical treatment of movement disorders, functional localization in cerebral cortex; motor system physiology, peripheral nerve regeneration and intraoperative neurophysiological monitoring.

**Board Certifications**

American Board of Neurophysiological Monitoring
Donald J. Crammond, PhD

Hospital Privileges
Armstrong County Memorial Hospital
Children’s Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Altoona
UPMC East
UPMC Horizon
UPMC McKeesport
UPMC Mercy
UPMC Northwest
UPMC Passavant, Cranberry
UPMC Passavant, McCandless
UPMC Presbyterian
UPMC St. Margaret
UPMC Shadyside

Professional Organization Membership
American Clinical Neurophysiology Society
American Society for Neurophysiological Monitoring
Movement Disorder Society
Society for Neuroscience

Education & Training
BSc (Hons), Physiology, University of Glasgow, 1980
PhD, Neurophysiology, University of Toronto, 1988
Fellowship, Neurophysiology, University of Wisconsin, 1987
Fellowship, Neurophysiology, Université de Montréal, 1992
Fellowship, Clinical Neurophysiology, University of Pittsburgh, 1999

Editorial Service
• Ad Hoc Reviewer:
  Clinical Neurophysiology
  Journal of Neurology, Neurosurgery and Psychiatry
  World Neurosurgery

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Lecturer, Neuroscience 1026, Foundations of Clinical Neurophysiology
  Lecturer, SOM MS4 ILS Course, Deep Brain Stimulation

  • Department of Neurological Surgery:
    Chair, Large Animal Research Protocol Review Committee

Professional Activities
Chairman, American Board of Neurophysiologic Monitoring

Publications: 2016-17
• Refereed Articles:


• Presentations:
  


C. Edward Dixon, PhD
Professor
The Neurotrauma Chair in Neurosurgery
Vice Chair, Research
Director, Brain Trauma Research Center
Research Health Scientist at the Geriatric Research, Education and Clinical Center in the Veteran’s Affairs Pittsburgh Health Care System

C. Edward Dixon, PhD, received his PhD degree in physiological psychology from the Virginia Commonwealth University in 1985. That year, he was awarded a National Research Service Award for Postdoctoral Fellows by the National Institutes of Health and joined the Division of Neurological Surgery at the Medical College of Virginia. In 1986, he became a postdoctoral fellow in the Biomedical Science Department of the General Motors Technical Center in Warren, Mich. Dr. Dixon was named assistant professor in the Division of Neurosurgery at the Medical College of Virginia in 1987 and became an assistant professor in the Department of Neurological Surgery at the University of Texas Health Science Center in Houston in 1991. In 1995, he joined the Brain Trauma Research Center in the Department of Neurological Surgery at the University of Pittsburgh as associate professor. He became the director of the center in October 2002. Dr. Dixon received his adjunct faculty positions with the Department of Anesthesiology in 1995; the Department of Neurobiology in 2000 and the Department of Physical Medicine/Rehabilitation in 2003. In 2001, he became a co-director of the Safar Center for Resuscitative Research. In May of 2004, Dr. Dixon was named full professor of neurological surgery at the University of Pittsburgh and was later appointed vice chairman of research in the Department of Neurological Surgery in 2008. In 2011, Dr. Dixon was honored with one of the highest honors the university can present a faculty member when he was awarded The Neurotrauma Chair in Neurosurgery at the University of Pittsburgh. Dr. Dixon served as president of the National Neurotrauma Society for the 2002-2003 term and continued as councilor of the society for terms 2004-2007 and 2009-2012. He also has continued as a study section participant of several public and private grant review panels. His research has dealt primarily with mechanisms of post-traumatic memory deficits, rodent models of traumatic brain injury, and functional outcomes. Dr. Dixon has published 211 papers in refereed journals, two books (coeditor), 29 book chapters, and two editorials.

Specialized Areas of Interest
Mechanisms of induction and recovery of functional deficits following traumatic brain injury; neurotransmitter agonist therapies for recovery of post traumatic functional deficits; models of traumatic brain injury; clinical studies of pharmacotherapy in TBI patients.

Professional Organization Membership
American Association for the Advancement of Science
Congress of Neurological Surgeons
International Behavioral Neuroscience Society
International Neurotrauma Society
National Neurotrauma Society (Charter Member)
Pittsburgh Chapter of Society for Neuroscience
Society for Neuroscience
C. Edward Dixon, PhD

Faculty Biographies

Education & Training
BA, Psychology, Virginia Commonwealth University, 1981
MS, Physiology/Psychology, Virginia Commonwealth University, 1984
PhD, Physiology/Psychology, Virginia Commonwealth University, 1985
NIH-NHRSA Fellow, Medical College of Virginia, 1986
Fellowship, General Motor Research Laboratories, 1987

Editorial Service
• Editorial Board:
  Frontiers in Neurotrauma
  Journal of Neurotrauma
  Metabolic Brain Disease
  Neural Regeneration Research
  Neurosurgery

• Ad Hoc Reviewer:
  Brain Injury
  Brain Research
  Journal of Biomechanical Engineering
  Journal of Cerebral Blood Flow and Metabolism
  Journal of Neurochemistry
  Journal of Neurosurgery
  Journal of Neuroscience
  Journal of Neuroscience Methods
  Learning and Memory
  NeuroMolecular Medicine
  Neuropathology and Applied Neurobiology
  Neuroscience
  Pharmacology, Biochemistry, and Behavior
  PLOS
  Stroke
  Therapeutic Hypothermia and Temperature Management

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Faculty Promotions Committee, Department of Neurosurgery
  Co-Chair, Research Executive Committee, Department of Neurosurgery
  Director, Walter L. Copeland Neurosurgery Research Laboratories
  Associate Director, Safar Center for Resuscitation Research, University of Pittsburgh
  Graduate Faculty Member, Center for Neuroscience and Neurobiology Training Program
  Training Faculty Member, NIH-NICHD Training Grant in Neurointensive Care
  Training Faculty Member, Center for Neuroscience at the University of Pittsburgh
  Pittsburgh VA Healthcare System Institutional Animal Care and Use Committee, Chair
  Pittsburgh VA Healthcare System R&D Committee

Professional Activities
Kentucky Spinal Cord & Head Injury Study Section, Chicago Ill.
Veterans Administration RR&D State-of-the Art on TBI, Invited Participant.
NIH SEP Member Conflict Study Section ZRG1 BDCN-K (02)
NIH SEC Member Conflict Study Section
Veterans Administration RR&D Service Scientific Merit Review Board
NIH SEC Member Conflict Study Section
NIH BINP Study Section
Faculty Biographies

C. Edward Dixon, PhD

Publications: 2016-17


• Book Chapters:

Matt El-Kadi, MD, PhD, FACS, joined the Department of Neurological Surgery as a clinical assistant professor in September of 1999. He became clinical associate professor in January 2003 and clinical professor in June 2006. He became vice chairman of the Department of Neurological Surgery in 2010 and has been chief of neurosurgery at UPMC Passavant since 2005. Dr. El-Kadi is also director of the UPMC Passavant Spine Center and is a member of the Tri-State Neurosurgical Associates. Dr. El-Kadi is board-certified in neurological surgery and has been nominated as one of Pittsburgh’s best doctors in the region since 2012 and as one of the best doctors in America by Castle Connelly since 2009. He specializes in the treatment of complex spine disorders, including spinal fusion and instrumentation, and minimally invasive spinal surgery for both the cervical and lumbar spine, with a special interest in the removal of primary and secondary spinal tumors. He has authored seven books and book chapters, and has over 100 publications in circulation. He is an active participant in professional societies. Before joining UPMC, Dr. El-Kadi received training in complex spinal surgery at Allegheny General Hospital in Pittsburgh. He completed his neurosurgery residency training at West Virginia University and a one-year clinical fellowship in neurosurgery at Hartford Hospital, University of Connecticut. Dr. El-Kadi began his surgical career doing brain surgery. The minimally invasive and microscopic techniques used then on the brain have served him well as a spine surgeon for minimally invasive approaches and has been reflected in his patients' shorter hospital stays and good outcome.

Specialized Areas of Interest
Minimally invasive spine surgery; complex spine disorders; spinal stabilization; spinal tumors.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Grove City Medical Center
Heritage Valley Hospital, Sewickley
UPMC Mercy
UPMC Passavant
UPMC Presbyterian
The Washington Hospital

Professional Organization Membership
Allegheny County Medical Society
American Academy of Anti-Aging Medicine
American Association of Neurological Surgeons
American Medical Association
Congress of Neurological Surgeons
International Spinal Injections Society
North American Spine Society
Ohio County Medical Society
Pennsylvania Medical Society
Pennsylvania Neurosurgical Society
Faculty Biographies

Matt El-Kadi, MD, PhD

Education & Training
MD, Second Moscow State Pirogov Medical Institute, 1983
Residency, Neurosurgery, Burdenko Neurosurgical Institute, 1989
Fellowship, Brain Tumor Research, LAC + USC Medical Center, 1992
Fellowship, Neurosurgery, University of Connecticut, 1994
Fellowship, Neurosurgery, Allegheny General Hospital, 1998
Residency, Neurosurgery, West Virginia University, 1999

Interdepartmental and Medical Center Activities
• UPMC Passavant:
  Chief of Neurosurgery
  Credentialing Committee
  Critical Care Committee
  Director, Spine Center
  Medical Executive Committee
  Operating Room Block Committee

• UPMC Passavant Hospital Foundation:
  Board of Directors, Passavant Hospital Foundation
  Chair, Development Committee

Honors and Awards
Best Doctors in America, 2009-16
Pittsburgh’s Best Doctor in Neurosurgery, Pittsburgh Magazine, 2012-17
Castle Connelly Top Doctors, 2009-16

Publications: 2016-17
• Refereed Articles:

Johnathan Engh, MD
Associate Professor
Director, Neuroendopore Surgery Program
Director, Adult Neurosurgical Oncology

Johnathan Engh, MD, joined the University of Pittsburgh Department of Neurological Surgery in 2008 as an assistant professor and director of the Neuroendopore Surgery Program after completing the department’s seven-year residency program. He subsequently built this program into a national referral center for deep-seated brain tumors and colloid cysts. Dr. Engh became the director of adult neurosurgical oncology at the University of Pittsburgh in 2014. He was promoted to associate professor in 2014 and he received a secondary appointment as associate professor in the Department of Radiation Oncology in 2016. Dr. Engh’s primary medical staff appointments are at UPMC Shadyside and UPMC Presbyterian Hospitals, but he also has consulting privileges at Children’s Hospital of Pittsburgh of UPMC, Magee-Womens Hospital of UPMC and UPMC Passavant. In addition, he provides outpatient consulting services via telemedicine at UPMC Bedford and UPMC Northwest. Originally from northern Virginia, Dr. Engh is a graduate of Duke University and the University of Virginia Medical School. Dr. Engh’s clinical focus is on neurosurgical oncology, especially minimally invasive operations for central nervous system tumors and intraventricular lesions. From a research perspective, his major interests are the development of minimally invasive tools for cranial surgery and surgical trials for the treatment of brain tumors.
Specialized Areas of Interest
CNS tumors, minimally invasive surgery, neurosurgical technology and innovation.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Passavant
UPMC Presbyterian
UPMC Shadyside

Professional Organization Membership
Allegheny County Medical Society
Alpha Omega Alpha
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Pennsylvania Medical Society
Society of Neuro-Oncology
University of Pittsburgh Cancer Institute

Education & Training
BS, Biology and Religion, Duke University, 1997
MD, University of Virginia, 2001
Residency, Neurological Surgery, University of Pittsburgh, 2008
Fellowship, Neurosurgical Oncology, University of Pittsburgh, 2007

Editorial Service
• Editorial Board:
  Frontiers in Radiation Oncology
  Journal of Neurology and Neurosurgery

• Ad Hoc Reviewer:
  European Journal of Cancer
  Journal of Medical Case Reports
  Journal of Neurology, Neurosurgery and Psychiatry
  Neurosurgery

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Ad Hoc member, University of Pittsburgh Human Research Protection Office
  Technology and Innovative Practices Assessment Committee
  Brain Tumor Research Group Member

• UPMC Shadyside:
  Quality and Patient Safety Committee

• Department of Neurological Surgery:
  Associate Program Director
  Core Competency Committee
Honors and Awards
America’s Best Doctors, 2011-17
Pittsburgh’s Best Doctors, 2012-17

Publications: 2016-17
• Refereed Articles:


• Newsletter Articles:


Invited Lectures: 2016-17
• National:

• Local/Regional:


Faculty Biographies

Johnathan Engh, MD


Engh J. “CNS for radiation oncology residents.” Radiation Oncology Department Meeting, UPMC Shadyside, Pittsburgh, Pa., September 20, 2016.


Wendy Fellows-Mayle, PhD

Research Assistant Professor
Coordinator, The Walter Copeland Laboratory

Wendy Fellows-Mayle, PhD, joined the faculty of the Department of Neurological Surgery at the University of Pittsburgh in July of 1999. She received her bachelor degree at the University of Pittsburgh in 1994 and her doctoral degree at the University of Pittsburgh in 2004. Dr. Fellows-Mayle is the director of the histology core laboratory for the Department of Neurological Surgery and the coordinator for the Walter Copeland Laboratory for Neurological Research.

Specialized Areas of Interest
Immunotherapy of brain tumors; gene therapy of brain tumors; epilepsy; intracranial pressure; craniosynostosis; traumatic brain injury.

Education & Training
BA, Physical Anthropology, University of Pittsburgh, 1994
MA, Physical Anthropology, University of Pittsburgh, 1998
PhD, Physical Anthropology, University of Pittsburgh, 2004

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Oversight of Anatomical Specimens Committee

Publications: 2016-17
• Refereed Articles:
Juan C. Fernandez-Miranda, MD, FACS
Associate Professor
Associate Director, Center for Skull Base Surgery
Director, Surgical Neuroanatomy Lab
Director, Fiber Tractography (HDFT) Lab

Juan C. Fernandez-Miranda, MD, is associate professor of neurological surgery, associate director of the Center for Cranial Base Surgery, and director of the Surgical Neuroanatomy Lab and Fiber Tractography Lab at the University of Pittsburgh School of Medicine. He is a fellow of the American College of Surgeons and he joined the faculty at the University of Pittsburgh Department of Neurological Surgery on July 1, 2008 to complete a two-year clinical fellowship in open and minimally invasive skull base, pituitary, and brain surgery with Amin Kassam, MD, Paul Gardner, MD, and Daniel Prevedello, MD. Prior to joining the faculty at University of Pittsburgh, Dr. Fernandez-Miranda completed a clinical fellowship in cerebrovascular surgery at the University of Virginia—under the direction of Neal F. Kassell, MD—and a two-year research fellowship in microsurgical neuroanatomy at the University of Florida—under the mentoring of Albert L. Rhoton, Jr., MD. Dr. Fernandez-Miranda received his medical degree from the Complutense University of Madrid (Spain) and completed his neurological surgery residency at “La Paz” University Hospital of Madrid. Upon completion of his residency, he was awarded the Sanitas Prize 2006 to the best medical postgraduate trainee in Spain. Dr. Fernandez-Miranda's clinical focus is endoscopic endonasal skull base and pituitary surgery, open skull base surgery, and complex brain surgery. His research interests lie in the study of surgical neuroanatomy and brain connectivity, and the application of innovative surgical techniques into the operating room. He has published more than 160 scientific peer-review papers, and he has lectured extensively at national and international scientific meetings and professional courses. The Surgical Neuroanatomy Lab that he directs has a dual educational and research role aiming to improve surgical techniques and outcomes by mastering knowledge of relevant surgical neuroanatomy. Many national and international physicians have conducted training and research at the Surgical Neuroanatomy Lab. The lab has three main research areas: microsurgical neuroanatomy, endoscopic skull base anatomy, and white matter anatomy. Dr. Fernandez-Miranda has major publications and awards on each of these areas, and his research work has contributed significantly to the development and expansion of endoscopic skull base surgery. The Fiber Tractography Lab, funded with a major NIH award, is focused on the application of advanced fiber mapping techniques—High-Definition Fiber Tractography (HDFT)—for presurgical planning and intraoperative navigation to facilitate brain function preservation and improve resection rates in patients with complex brain lesions. Dr. Fernandez-Miranda’s work is also centered on studying the structure and connectivity of the fiber tracts forming the “Human Connectome,” and their structural alteration in patients with brain tumors, vascular lesions, stroke, and neurodegenerative diseases. In addition to his clinical and research activities, Dr. Fernandez-Miranda is greatly devoted to teaching and education of residents and fellows, and he received the 2017 best faculty teaching award as selected by his neurosurgery residents. He enjoys teaching 3D surgical neuroanatomy and techniques at local, national, and international venues.

Specialized Areas of Interest
Endoscopic pituitary surgery; minimally invasive endoscopic skull base and brain surgery; open skull base surgery; brain tumors. Research focuses on surgical neuroanatomy (microsurgical neuroanatomy, endoscopic skull base anatomy, and white matter anatomy), advanced brain imaging techniques, and brain connectivity.
Facultad Biografías

Juan C. Fernandez-Miranda, MD, FACS

**Board Certifications**
Spanish Society of Neurosurgery, Spanish Ministry of Science and Education
European Association of Neurosurgical Societies, European Board of Neurosurgery
Fellow of the American College of Surgeons (FACS)

**Hospital Privileges**
Children’s Hospital of Pittsburgh of UPMC
UPMC Mercy
UPMC Presbyterian

**Professional Organization Membership**
American Association of Neurological Surgeon
American College of Surgeons
Cajal Club
Congress of Neurological Surgeons
European Association of Neurosurgical Societies
German Skull Base Society
International Head and Neck Scientific Group
Joint Section on Tumors – AANS & CNS
North American Skull Base Society
Pennsylvania Neurosurgical Society
The Pituitary Society
Spanish Society of Neurosurgery

**Education & Training**
MD, Complutense University of Madrid, 2000
Residency, Neurosurgery, “La Paz” University Hospital of Madrid, 2006
Fellowship, Microsurgical Neuroanatomy, University of Florida, 2007
Fellowship, Cerebrovascular Surgery, University of Virginia, 2008
Fellowship, Endoscopic Endonasal/Skull Base Surgery, University of Pittsburgh, 2010

**Editorial Service**
- **Editorial Board:**
  Journal of Neurological Surgery
  Neurocirugia
  Operative Neurosurgery

- **Ad Hoc Reviewer:**
  Brain Structure and Function
  Cerebral Cortex
  Clinical Neurology and Neurosurgery
  Head and Neck
  Journal of Neurosurgery
  Laryngoscope
  Neurosurgery
  Neuroscience Letters

**Interdepartmental and Medical Center Activities**
- **University of Pittsburgh:**
  MRRC (Magnetic Resonance Research Center) Committee
Professional Activities
Course Co-Director: Advanced Endoscopic Endonasal Surgery of the Skull Base. University of Pittsburgh School of Medicine, Pittsburgh, Pa., August 18-20, 2016.
Course Director: Complex Skull Base and Brain Tumor Surgery: 3D Surgical Anatomy and Technical Nuances. Congress of Neurological Surgeons, San Diego, Calif., September 24, 2016.
Course Faculty: Tenth Annual Microscopic / Endoscopic Skull Base Surgery Course and Vascular Bypass Animal Lab, Allegheny General Hospital, Pittsburgh, Pa., November 9-12, 2016.
Course Co-Director: Comprehensive Endoscopic Endonasal Surgery of the Skull Base. University of Pittsburgh School of Medicine, Pittsburgh, Pa., December 7-10, 2016; May 10-13, 2017.
Course Co-Director: In-vivo Animal Training for Endoscopic Endonasal Surgery, University Hospital La Paz, Madrid, Spain, June 22, 2017.

Honors and Awards
Pedro Mata Award of the Neurosurgical Society of Madrid to the Best Neurosurgical Research for the work “Three-Dimensional Microsurgical Anatomy and Tractography of the White Matter of the Human Brain.” 2005
Sanitas Prize 2006 to the Best Medical Postgraduate Trainee in Spain.
Recipient of the Synthes CMF (Cranio-Maxillofacial) Anatomical Fellowship. 2007
European Skull Base Fellowship Award, 2009.
VII National Research Award, Barclays Foundation, 2009
NIH-R01 Award (R01DC013803-01A1), 2015-2020
University of Pittsburgh, Department of Neurological Surgery Annual Faculty Teaching Award, 2017

Publications: 2016-17
• Refereed Articles:


- **Book Chapters:**


- **Published Abstracts:**


Faculty Biographies

Juan C. Fernandez-Miranda, MD, FACS


• Web-Based Presentations:


**Invited Lectures: 2016-17**

- **International:**

  Fernandez-Miranda JC. “Endoscopic endonasal approach to the suprasellar region and anterior skull base.” Brazilian Congress of Neurosurgery, Brasilia, Brazil, September 6, 2016.

  Fernandez-Miranda JC. “Endoscopic endonasal approach to the clival and petroclival region.” Brazilian Congress of Neurosurgery, Brasilia, Brazil, September 6, 2016.


Fernandez-Miranda JC. "3D Surgical Anatomy Lecture: Middle and Infratemporal Fossa." National Skull Base Endoscopy Conference, Xi’an, China, April 9, 2017.


• National:

Faculty Biographies

Juan C. Fernandez-Miranda, MD, FACS


• Local/Regional:


Robert M. Friedlander, MD, MA

Walter E. Dandy Professor
Chair, Department of Neurological Surgery
Head of Cerebrovascular Neurosurgery
Co-Director, UPMC Neurological Institute

On June 1, 2010, Robert Friedlander, MD, MA, became the fourth chair in the department’s history. Prior to joining the department, Dr. Friedlander was professor of neurosurgery at Harvard Medical School and vice-chairman of neurosurgery and associate director of cerebrovascular surgery at Brigham and Women’s Hospital in Boston. As a sign of his prominence as a clinician and scientist, Dr. Friedlander is one of a very select group of authors to have been invited by the New England Journal of Medicine to write both a basic science review (mechanisms of neuronal cell death), as well as a clinical review (management of AVMs). Clinically, Dr. Friedlander focuses on the operative management of complex cerebrovascular disorders and brain tumors. Dr. Friedlander’s major research interests lie in the study of the mechanistic pathways of the caspase apoptosis gene family. As co-director of Brigham and Women’s Neuroscience Research Center, his work includes the evaluation of treatment strategies for neurodegenerative diseases (Huntington’s and ALS), stroke, brain trauma, and spinal cord injury through the modulation of the caspase-family apoptotic pathways. Dr. Friedlander’s research has received significant media attention including major work published in Nature, Science, and Nature Medicine. His work has also been recognized through many academic awards, including the Neurosurgery Resident Award from the Congress of Neurological Surgeons, the Bayer Cerebrovascular Award from the Joint Section of Cerebrovascular Surgery, the International Charcot Prize for Motor Neuron Diseases, and the Award from the Academy of Neurological Surgeons. In 2006, he was elected as a member of the prestigious American Society for Clinical Investigation. Dr. Friedlander is only one of two neurosurgeons elected as a member of the American Association of Physicians.

Specialized Areas of Interest
Aneurysms, vascular malformations, brain tumors, carotid disease, cerebrovascular disease, Chiari malformation, spinal cord tumors. Research focuses on mechanisms of apoptosis, Huntington’s disease, ALS, and stroke.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Altoona
UPMC Hamot
UPMC Mercy
UPMC Passavant
UPMC Presbyterian
UPMC Shadyside

Professional Organization Membership
American Academy of Neurological Surgeons
American Association for the Advancement of Science
American Association of Neurological Surgeons
American Association of Physicians
American Society for Clinical Investigation
Faculty Biographies

Robert M. Friedlander, MD, MA

Brain Aneurysm Foundation, Medical Advisory Board
Congress of Neurological Surgeons
Joint Section of Cerebrovascular Surgery
Sociedad Venezolana de Neurocirugia
Society for Neurological Surgeons
Society for Neuroscience

Education & Training
BA, Brandeis University, 1987
MA, Biochemistry, Brandeis University, 1987
MD, Harvard Medical School, 1991

Editorial Service
• Editorial Board:
  Neurological Surgery
  Neurosurgery
  U.S. Neurology

• Ad Hoc Reviewer:
  Annals of Neurology
  Cell Death and Differentiation
  EMBO
  Experimental Neurology
  Human Molecular Genetics
  Journal of Biological Chemistry
  Journal of Neurochemistry
  Journal of Neuroscience
  Letters in Drug Design and Discovery
  Nature
  Nature Biotechnology
  Nature Cell Biology
  Nature Genetics
  Nature Medicine
  Nature Neuroscience
  Nature Reviews Molecular Biology
  Neuron
  Neuropharmacology
  Neuroscience Letters
  Neurosurgery
  New England Journal of Medicine
  Proceedings of the National Academy of Sciences
  Science
  Trends in Neuroscience

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Medical Executive Committee

• UPMC:
  Global Care Steering Committee
Faculty Biographies

Robert M. Friedlander, MD, MA

- University of Pittsburgh:
  School of Medicine Executive Committee

- University of Pittsburgh Physicians:
  Finance Committee

- University of Pittsburgh Cancer Institute:
  Comprehensive Stereotactic Radiosurgery Program Meetings

Professional Activities
Society of Neurological Surgeons:
  Director, Research Update of Neurosciences for Neurosurgeons (RUNN Course)
  Research Committee
NINDS National Advisory Council:
  Clinical Trials Subcommittee
  Fellowships and Training Subcommittee
  Basic Science Subcommittee
  American Academy of Neurological Surgeons Annual Meeting Committee
  Research Committee
The American Academy of Neurological Surgery:
  Scientific Program Committee Chair
  AANS/CNS Joint Cerebrovascular Surgery Section Chair
  Chair, Inaugural Peter J. Jannetta Symposium, April 8, 2017
  Co-Director, AANS/ASTRO Stereotactic Radiosurgery Course, June 9-11, 2017

Honors and Awards
Pittsburgh Magazine Best Doctors in America, 2012-17
America’s Top Surgeons, 2013
H. Richard Winn Prize for Neurosurgical Research
Castle Connolly Top Doctor in the Field of Neurological Surgery, 2013
Honored Guest, U.S. Ambassador, Belgrade, Serbia, 2013

Media Appearances: 2016-17

Publications: 2016-17
- Refereed Articles:
Faculty Biographies


Invited Lectures: 2016-17

• International:
  Friedlander RM. “Mitochondrial protein import defect in Huntington’s Disease.” The World Congress on Targeting Mitochondria, Berlin, Germany, October 22-27, 2016

• National:
  Friedlander RM. “Skating to where the puck will be: strategies for neurosurgery practices and programs.” American Association of Neurological Surgeons Annual Scientific Meeting, Los Angeles, Calif., April 23-26, 2017.

• Visiting Professorships:

Paul A. Gardner, MD
Associate Professor
Executive Vice Chair, Surgical Services
Neurosurgical Director, Center for Cranial Base Surgery

Paul A. Gardner, MD, joined the faculty at the University of Pittsburgh Department of Neurological Surgery in 2008 after completing his residency and fellowship training at the University of Pittsburgh. He completed his undergraduate studies at Florida State University, majoring in biochemistry, and received his medical degree from the University of Pittsburgh School of Medicine. Dr. Gardner completed a two-year fellowship in endoscopic pituitary and endoscopic and open skull base surgery. His research has focused on evaluating patient outcomes following these surgeries and more recently on genomic and molecular analysis of rare tumors. Dr. Gardner has been the neurosurgical director of the Center for Cranial Base Surgery at the University of Pittsburgh Medical Center since April of 2008. Dr. Gardner is co-author of the book Skull Base Surgery, part of the Master Techniques in Otolaryngology: Head and Neck Surgery series published by Wolters Kluwer. The book offers step-by-step expert instruction on more than 45 procedures, covering both open and
Paul A. Gardner, MD

minimally invasive approaches to the skull base. In addition, he is an author on nearly 200 peer-reviewed articles.

Specialized Areas of Interest
Endoscopic endonasal and open skull base surgery; pituitary tumors; vascular surgery; cranial nerve disorders; minimally invasive surgery; peripheral nerve surgery.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
UPMC Mercy
UPMC Presbyterian
Veterans Affairs Pittsburgh Healthcare System

Professional Organization Membership
Acoustic Neuroma Association
American Association of Neurological Surgeons
American Medical Association
Congress of Neurological Surgeons
North American Skull Base Society
Pennsylvania Neurological Society
Pituitary Network Association

Education & Training
AA, Okaloosa-Walton College, 1993
BS, Biochemistry, Florida State University, 1997 (Magna Cum Laude)
MD, University of Pittsburgh, 2001
Fellowship, Endoscopic and Open Skull Base Surgery, 2007
Residency, Neurosurgery, University of Pittsburgh, 2008

Editorial Service
• Editorial Board:
  Operative Neurosurgery

• Ad Hoc Reviewer:
  Journal of Neuroscience and Rehabilitation
  Journal of Neurosurgical Sciences Reviewer
  Neurosurgery
  World Neurosurgery

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Surgical Services Oversight Committee Representative
  Executive Vice Chairman, Surgical Services
  Neurosurgical Director, Center for Skull Base Surgery

Professional Activities
Medical Advisory Board, Chordoma Foundation
Course Co-Director, UPMC Endonasal Endoscopic Hands-On Skull Base Cadaver Dissection Course, National Yang Ming University, Taipei Veterans General Hospital, Taipei, Taiwan, July 21-23, 2016.
Faculty Biographies

Paul A. Gardner, MD

Course Co-Director, Advanced Endoscopic Endonasal Surgery of the Skull Base, University of Pittsburgh School of Medicine, Pittsburgh, Pa., August 18-20, 2016.
Course Co-Director, Comprehensive Endoscopic Endonasal Surgery of the Skull Base, University of Pittsburgh School of Medicine, Pittsburgh, Pa., December 7-10, 2016 and May 10-13, 2017.
Faculty, FESS & Endoscopic Endonasal Surgery of the Pituitary Fossa and Cranial Base Course, Alicante, Spain, October 6, 2016.
Faculty, Navigated Endoscopic Sinus Surgery Basic, Advanced and Skull Base Course, Maribor, Slovenia, February 2-4, 2017.
Faculty, Beijing International Congress of Neuroendoscopy and Workshop, Beijing, China, May 18, 2017.

Honors and Awards
Best Doctors, Pittsburgh Magazine, 2012-17

Publications: 2016-17

• Refereed Articles:


**Book Chapters:**


**Published Abstracts:**


• Presentations:


  Paul A. Gardner, MD
Faculty Biographies


Invited Lectures: 2016-17

• International:


• National:
  Gardner PA. "Advances and limitations of endoscopic endonasal surgery." Neuroscience Grand Rounds, University of Louisville School of Medicine, Louisville, Ky., January 12, 2017.


• Local/Regional:
  Gardner PA. “Advantages of the endoscopic endonasal approach to pituitary tumors.” Endocrine Fellows Conference, Division of Endocrinology, University of Pittsburgh School of Medicine, Pittsburgh, Pa., October 13, 2016.

• Web-Based Lecture:


• Live Surgery Presentations:


• Visiting Professorships:
  University of Maryland, Department of Radiation Oncology, Baltimore, Md.: “Endoscopic skull base surgery.” December 16, 2016.
Peter C. Gerszten, MD, MPH, FACS
Peter E. Sheptak Professor
Vice Chair, Quality Improvement
Director, Percutaneous Spine Service

Peter C. Gerszten, MD, MPH, is the Peter E. Sheptak Professor of Neurosurgery at the University of Pittsburgh. Dr. Gerszten joined the Department of Neurological Surgery and the UPMC Spine Services Division in 1999. He received his undergraduate degree from the University of Virginia and completed his medical degree at the Johns Hopkins School of Medicine. He completed his residency in neurological surgery at the University of Pittsburgh Medical Center. Dr. Gerszten obtained a master of public health degree from the University of Pittsburgh Graduate School of Public Health. He completed a fellowship in spinal surgery at the University of Pittsburgh Medical Center. Dr. Gerszten specializes in disorders of the spine, focusing on spinal neoplasms. His clinical interests include minimally invasive approaches to the treatment of spinal disorders and spinal tumors. Dr. Gerszten’s area of research is the application of outcomes research to spinal surgical interventions. He is a pioneer in the field of spine radiosurgery and oversees the instruction of this developing area of neurosurgery for the American Association of Neurological Surgery. Dr. Gerszten is co-editor of the 2015 second edition Spine Radiosurgery, an authoritative textbook—and the first of its kind—on all aspects of spine radiosurgery. He is also co-editor of the book Controversies in Stereotactic Radiosurgery: Best Evidence Recommendations, a 277-page look into an evidence-based approach to stereotactic radiosurgery for the brain and spine. Dr. Gerszten currently serves on the editorial boards of Neurosurgery, The Spine Journal, The Journal of Radiosurgery and SBRT and Neurosurgical Focus. He also serves on the board of directors of The Radiosurgery Society.

Specialized Areas of Interest
Outcomes research applied to neurosurgical interventions; failed back syndrome; epidural fibrosis; stereotactic radiosurgery of spinal lesions; minimally invasive spine surgical techniques; spinal motion preservation techniques.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Magee-Womens Hospital of UPMC
UPMC Presbyterian
UPMC Shadyside
Veterans Affairs Pittsburgh Healthcare System

Professional Organization Membership
Allegheny County Medical Society
American Academy of Neurological Surgery
American Association of Neurological Surgeons
American College of Surgeons
American Medical Association
Cervical Spine Research Society
Congress of Neurological Surgeons
Delta Omega Public Health National Honor Society
International Stereotactic Radiosurgery Society
Joint Section on Disorders of the Spine and Peripheral Nerves
North American Spine Society
Peter C. Gerszten, MD, MPH, FACS

Faculty Biographies

Paleopathology Society
Pennsylvania Neurosurgical Society
Pennsylvania State Medical Society
Radiosurgery Society
Sociedad Iberolatinoamericano de Radiocirugia

Education & Training
BA, University of Virginia, 1988
MD, Johns Hopkins School of Medicine, 1992
MPH, University of Pittsburgh Graduate School of Public Health, 1998
Residency, Neurological Surgery, University of Pittsburgh, 1999
Fellowship, Spine Surgery, University of Pittsburgh, 2000

Editorial Service
• Editorial Board:
  Neurosurgery
  The Spine Journal
  The Journal of Radiosurgery and SBRT
  Neurosurgical Focus

• Ad Hoc Reviewer:
  International Journal of Radiation Oncology Biology Physics
  The Journal of Radiosurgery and SBRT
  Oncology
  Neurosurgery
  Neurosurgical Focus
  Journal of Neurosurgery: Spine
  Radiation Oncology
  Neuro-Oncology
  The Spine Journal
  World Neurosurgery
  Practical Radiation Oncology
  Cureus

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Total Quality Council

• University of Pittsburgh:
  Chair, Data Safety Monitoring Board
  Editor, Department of Neurological Surgery Neurosurgery News quarterly newsletter

• UPMC:
  Vice Chairman for Quality Improvement, Department of Neurological Surgery
  Director of Percutaneous Spine Surgery
  Director of Spine Radiosurgery
  Physician Services Division Physician Clinical Quality Leadership Committee
  Hospital Acquired Conditions (HAC) Steering Committee, UPMC Presbyterian and UPMC Shadyside Hospitals
Professional Activities
Member of the United States Panel for the Appropriate Management of Osteoporotic Vertebra Fractures
International Spine Radiosurgery Consortium Member
Board of Directors, The Radiosurgery Society
The Radiosurgery Society Annual Meeting:
  Scientific Program Committee
  Abstract Review Committee
Course Lecturer, Principles and Practice of Gamma Knife Radiosurgery, Pittsburgh, Pa.
(six courses per year)
Course Faculty, AANS/ASTRO Stereotactic Radiosurgery Course for Neurosurgery and Radiation Oncology Residents, Pittsburgh, Pa.

Community Activities
The Portrait Society, The Warhol Museum
The Patron’s Society, Carnegie Museums of Pittsburgh
Peter C. Gerszten Endowed Fund for Research in Anthropology, University of Virginia
Gerszten Family Lectureship in Spanish Literature, University of Virginia

Honors and Awards
Pittsburgh’s Best Doctors, Pittsburgh Magazine, 2016-17

Publications: 2016-17
• Refereed Articles:


**Invited Papers:**

**Book Chapters:**


**Published Abstracts:**

• Presentations:


Invited Lectures: 2016-17
• National:

Faculty Biographies


• Local/Regional:
Gerszten PC. “Introduction to Spine Radiosurgery.” Area of Concentration: Neuroscience Lecture Series, Medical Students, University of Pittsburgh Medical Center, Pittsburgh, Pa., October 19, 2016.


Gerszten PC. “Management of Osteoporotic Compression Fractures.” Grand Rounds. Section of Hospital Medicine, UPMC Division of Internal Medicine, Pittsburgh, Pa., May 12, 2017.


Avniel Singh Ghuman, PhD
Assistant Professor
Director, MEG Research

Avniel Singh Ghuman, PhD, joined the Department of Neurological Surgery in September of 2011. Dr. Ghuman received his undergraduate education in math and physics at The Johns Hopkins University. He completed his doctoral education in biophysics at Harvard University. He completed his postdoctoral training at the National Institute of Mental Health prior to joining the faculty at the University of Pittsburgh. As director of MEG (Magnetoencephalography) Research, one of Dr. Ghuman’s primary roles is to facilitate, develop, and advance clinical and basic neuroscience research using MEG. To this end, he is helping to develop new research applications for MEG in collaboration with researchers throughout the community. MEG is the most powerful functional neuroimaging technique for noninvasively recording magnetic fields generated by electrophysiological brain activity, providing millisecond temporal resolution and adequate spatial resolution of neural events. Dr. Ghuman’s research focuses on how our brain turns what falls upon our eyes into the rich meaningful experience that we perceive in the world around us. Specifically, his lab studies the neural basis of the visual perception of objects, faces, words, and social and affective visual images. His lab examines the spatiotemporal dynamics of how neural activity reflects
Avniel Singh Ghuman, PhD

the stages of information processing and how information flow through brain networks responsible for visual perception. To accomplish these research goals Dr. Ghuman’s lab records electrophysiological brain activity from humans using both invasive (intracranial EEG; iEEG — in collaboration with R. Mark Richardson, MD, PhD) and non-invasive (magnetoencephalography; MEG) measures. In conjunction with these millisecond scale recordings they use multivariate machine learning methods, network analysis, and advanced signal processing techniques to assess the information processing dynamics reflected in brain activity. Additionally, his lab uses direct neural stimulation to examine how disrupting and modulating brain activity alters visual perception. This combination of modalities and analysis techniques allow Dr. Ghuman to ask fine-grained questions about neural information processing and information flow at both the scale of local brain regions and broadly distributed networks.

Specialized Areas of Interest
The dynamics of brain interactions; visual cognition; magnetoencephalography (MEG), intracranial EEG (iEEG); face recognition; reading; social and affective perception.

Professional Organization Membership
Society for Neuroscience
Cognitive Neuroscience Society
Organization for Human Brain Mapping
Vision Sciences Society

Education & Training
BA, Math and Physics, The Johns Hopkins University, 1998
PhD, Biophysics, Harvard University, 2007

Honors and Awards
NARSAD Young Investigator Award
National Institute of Mental Health Biobehavioral Research Award for Innovative New Scientists

Media Appearances: 2016-17
“Study shows how words are represented in the brain,” July 20, 2016, UPI
“Decoding Reading in the Brain,” July 19, 2016, Cognitive Neuroscience Society
“(Reading) The Reading Mind,” July 8, 2016, ReliaWire.com

Publications: 2016-17
• Refereed Articles:


Faculty Biographies


**Paola Grandi, PhD**  
*Assistant Professor of Neurological Surgery/Molecular Genetics and Biochemistry*

Paola Grandi, PhD, joined the Department of Neurological Surgery as an assistant professor in April of 2005. She has a joint appointment in the Department of Microbiology and Molecular Genetics. Dr. Grandi received a bachelor degree in biology from University of Ferrara in 1996 and her master's degree in genetics in 1997. She earned a PhD in biochemistry from the University of Ferrara in 2001. In 2001 Dr. Grandi received a fellowship for U.S. study from University of Ferrara and was a post-doctoral fellow from 2001-2005 in the Molecular Neurogenetics Department at the Massachusetts General Hospital. She is a member of the American Society of Gene Therapy and American Association Cancer Research and is the assistant editor of the journal Gene Therapy. Dr. Grandi’s research interests include studies to understand the development and progression of brain tumors emphasizing the role of miRNAs in cancer genetics. She has a long standing interest in the molecular biology of herpes simplex virus, mechanisms of virus replication and neuropathogenesis and virus host cells interactions that result in innate immune responses to infection. Much of Dr. Grandi’s recent work has centered on the creation of herpes viral vectors for treatment of glioblastoma. Her research has been primarily sponsored by the NIH through R01 and P01 grants that led to the development of a new technology to treat brain tumor—oncolytic vectors capable of selectively infecting and killing cancer cells while sparing surrounding healthy tissue. This technology has been acquired by a newly developed biotech company, Oncorus, Inc., that plans to bring this new product to the market. Dr. Grandi is also one of the scientific founders of Oncorus.

**Specialized Areas of Interest**  
Gene therapy for brain tumors using HSV-based vectors; molecular targeting to tumor cells; molecular mechanisms of tumor cell migration and the role of miRNAs in cancer progression; extra-cellular Matrix (ECM).

**Professional Organization Membership**  
American Society of Gene and Cell Therapy  
American Association of Cancer Research  
Society for Neuroimmunology  
International Society for Stem Cell Research
Editorial Service
- Editorial Board:
  Molecular Therapy Oncolytics

- Ad Hoc Reviewer:
  Gene Therapy
  Journal of Virology
  Molecular Therapy
  Nature Reviews
  Plos One
  Neuro-oncology

Professional Activities
American Society of Gene & Cell Therapy 20th Annual Meeting:
  Abstract Review Chair, Cancer-Targeted Gene and Cell Therapy category
  Chair, Cancer-Oncolytic Viruses
  Chair, Targeted Gene & Cell Therapy

Oncorus, Inc.:
  Scientific Founder
  Director, Immunology/Virology Oncorus

Publications: 2016-17
- Refereed Articles:


Invited Lectures: 2016-17
- National:

Stephanie Greene, MD
Assistant Professor

Stephanie Greene, MD, joined the faculty of the Department of Neurological Surgery in the pediatric neurosurgery division at Children’s Hospital of Pittsburgh in 2009. Dr. Greene graduated from Dartmouth College in 1993 with a degree in biology and psychology, and a concentration in neuroscience. She earned her medical degree from Albany Medical College, and completed her neurosurgical residency at Harvard University in the Brigham & Women’s and Children’s Hospital of Boston program. Her fellowship in pediatric neurosurgery was completed through the University of Washington program at Seattle Children’s Hospital in 2005. She is board certified in adult and pediatric neurosurgery. She was the director of pediatric neurosurgery at Hasbro Children’s Hospital, affiliated with Brown University, prior
to accepting her position at Children's Hospital of Pittsburgh. She is the director of vascular neurosurgery and perinatal neurosurgery at Children's Hospital of Pittsburgh.

**Specialized Areas of Interest**
- Vascular malformations; MoyaMoya syndrome; Chiari malformation; spinal dysraphism; peripheral nerve disorders; brain tumors; fetal surgery.

**Board Certifications**
- American Board of Neurological Surgeons
- American Board of Pediatric Neurological Surgeons

**Hospital Privileges**
- Children's Hospital of Pittsburgh of UPMC
- Magee-Womens Hospital of UPMC

**Professional Organization Membership**
- American Association of Neurological Surgeons
- American Society of Pediatric Neurosurgeons
- AANS/CNS Joint Section on Pediatric Neurosurgery
- AANS/CNS Joint Section on Tumors
- Congress of Neurological Surgeons
- Pediatric Craniocervical Society
- Pennsylvania Neurosurgical Society
- Sigma Xi
- Women in Neurosurgery
- World Federation of Neurosurgical Societies

**Education & Training**
- AB, Biology/Psychology, Dartmouth College, 1993
- MD, Albany Medical College, 1998
- Residency, Neurosurgery, Penn State University, 2000
- Residency, Neurosurgery, Harvard University, 2004
- Fellowship, Pediatric Neurosurgery, 2005

**Editorial Service**
- **Editorial Board:**
  - Remedy Open Access
  - *Journal of Neurology, Neurosurgery and Spine*
- **Ad Hoc Reviewer:**
  - *Anesthesia and Analgesia*
  - *Child's Nervous System*
  - *Case Reports in Ophthalmology*
  - *Cancer Medicine*
  - *Neurosurgery*
  - *Pediatric Neurosurgery*
  - *Spinal Cord Injury Rehabilitation*
  - *Journal of Pediatric Neurology*
Faculty Biographies

Stephanie Greene, MD

Interdepartmental and Medical Center Activities
• Children’s Hospital of Pittsburgh:
  Brachial Plexus Birth Trauma Committee
  Fetal Diagnosis and Treatment Committee
  Pediatric Neuro-oncology Board
  Vascular Anomalies Committee

• University of Pittsburgh:
  School of Medicine Admissions Interview Committee
  Scholarly Project Mentor
  Physician-Scientist Training Program Mentor
  Pitt Med Association of Women Surgeons Mentor

Professional Activities
Abstract reviewer for national meetings of CNS, AANS, Joint Pediatric Section, and ASPN
AANS Resident Mentor
Walter L. Copeland Fund Grant Review Committee for the Pittsburgh Foundation

Honors and Awards
Castle Connolly Exceptional Women in Medicine, 2017
American’s Most Honored Professionals (American Registry), 2017
Castle Connolly Regional Top Doctor, 2017
Castle Connolly Metro Area Top Doctor, 2016
Castle Connolly Top Doctor, 2016
Top Ten Doctor – Metro Area, City, and State (Vitals.com), 2013-present
Patients’ Choice 5-Year Honoree, 2013-present
America’s Most Compassionate Doctors, 2011-present
Patients’ Choice Award, 2008-present

Publications: 2016-17
• Refereed Articles:

Invited Lectures: 2016-17
• National:

- Local/Regional:

- Visiting Professorships:

**Bradley Gross, MD**

**Assistant Professor**

Bradley Gross, MD, joined the Department of Neurological Surgery as an assistant professor in July of 2016 specializing in cerebrovascular disease. His particular clinical and research interests include the comprehensive management of aneurysms, arteriovenous malformations, arteriovenous fistulas and cavernous malformations of the brain and spinal cord. He also performs embolization of brain and spinal cord tumors, revascularization for acute ischemic stroke as well as cervical, intracranial and venous stenting. Dr. Gross graduated Summa Cum Laude from Northwestern University and then earned his medical degree from Northwestern University Medical School. He completed his internship and neurosurgical residency at Brigham and Women’s Hospital/Boston Children’s Hospital/Harvard Medical School. He then had the privilege to serve as an endovascular fellow at the Barrow Neurological Institute.

**Specialized Areas of Interest**

Intracranial aneurysms; arteriovenous malformations; arteriovenous fistulas; cavernous malformations; brain tumors; carotid stenosis; intracranial stenosis; venous sinus stenosis; ischemic stroke.

**Hospital Privileges**

Children’s Hospital of Pittsburgh of UPMC
UPMC Altoona
UPMC Mercy
UPMC Presbyterian
UPMC Shadyside

**Professional Organization Membership**

Alpha Omega Alpha
American Association of Neurological Surgeons
AANS/CNS Joint Section of Cerebrovascular Neurosurgery
Congress of Neurological Surgeons
Society of Neurointerventional Surgery
Phi Beta Kappa

**Education & Training**

BA with Honors, Chemistry, Northwestern University, 2004
MD, Feinberg School of Medicine, Northwestern University, 2008
Internship, Harvard Medical School, 2009
Residency, Harvard Medical School, 2015
Fellowship, Endovascular Neurosurgery, Barrow Neurological Institute, 2016
Bradley Gross, MD

Faculty Biographies

Editorial Service

- Ad Hoc Reviewer:
  - *Lancet Neurology*
  - *Neurology*
  - *Journal of Neurointerventional Surgery*
  - *Journal of Neurology, Neurosurgery and Psychiatry*
  - *World Neurosurgery*

Professional Activities

Faculty, Introduction to Cerebrovascular Residents Course, American Association of Neurological Surgeons Annual Meeting, Los Angeles, Calif., April 22, 2017.

Publications: 2016-17

- **Refereed Articles:**


Faculty Biographies

Bradley Gross, MD


• Invited Papers:


• Book Chapters:


• Presentations:

Faculty Biographies


Invited Lectures: 2016-17
• National:
  Gross BA. “Endovascular Neurosurgery at the BNI.” Annual Barrow Neurological Institute Symposium, Barrow Neurological Institute, Phoenix, Ariz., May 18, 2017.

• Local/Regional:


D. Kojo Hamilton, MD
Associate Professor
Co-Director, Spine Fellowship Program

D. Kojo Hamilton, MD, a recognized leader in scoliosis, adult spinal deformity and trauma, joined the faculty at the University of Pittsburgh Department of Neurological Surgery in July of 2014. He received his medical degree and residency training from the University of Virginia in Charlottesville, Va. He underwent further subspecialty training in complex spine, spinal deformity, scoliosis and spine surgical oncology, with a combined neurosurgical and orthopedic (AOSpine) fellowship, at the University of Virginia. Dr. Hamilton further received subspecialty training in Auckland City Hospital in Auckland, New Zealand. He is board certified in neurological surgery and a fellow of the American Association of Neurological Surgeons and a candidate member of the Scoliosis Research Society. After training, Dr. Hamilton received appointments at the University of Maryland School of Medicine and Maryland Shock Trauma Hospital where he treated patients with complex spine deformity and severe spine and brain trauma. Before joining UPMC, Dr. Hamilton was at the Oregon Health and Science University Spine Center where he treated patients with neurological trauma as well as spinal deformity conditions including adult idiopathic scoliosis, spondylolisthesis and general back and neck pain. Dr. Hamilton is nationally involved in teaching advanced and current techniques in scoliosis and adult spine deformity. He has an extensive research background in spine surgery and has presented nationally and internationally on the subject. Dr. Hamilton has received several awards and accolades from his patients, nurses and peers, including best doctor peer pools—locally and nationally—since his first year at the University of Pittsburgh School of Medicine.

Specialized Areas of Interest
Scoliosis, adult and pediatric spinal deformity, cranial and spine trauma.

Board Certifications
American Board of Neurological Surgery
Fellow of the American Association of Neurological Surgeons
Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
Monongahela Valley Hospital
UPMC Hamot Medical Center
UPMC Mercy
UPMC Presbyterian

Professional Organization Membership
American Association of Neurological Surgeons (AANS)
AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves
AANS/CNS Joint Section on Neurotrauma and Critical Care
AOSpine North America (AOSNA)
Congress of Neurological Surgeons (CNS)
Scoliosis Research Society

Education & Training
BS (High Honors), Biochemistry, University of Maryland, 1998
MD, University of Virginia, 2003
Fellowship, Brain and Spine, Auckland City Hospital, 2008
Residency, University of Virginia, 2009
Fellowship, Complex Spine, University of Virginia, 2010

Editorial Service
• Editorial Board:
  European Spine Journal (Advisory Editorial Board Member)
  Neurosurgery
• Ad Hoc Reviewer:
  Global Spine Journal
  Journal of Neurosurgery
  Journal of Neurosurgery: Neurosurgical Focus
  Journal of Neurosurgery: Spine
  Neurosurgery
  The Spine Journal

Professional Activities
IMAST Committee, Scoliosis Research Society
MOC/CME Committee, American Association of Neurological Surgeons
AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves:
  Executive Committee
  Rapid Response Team
  Exhibit Committee
(ABNS) Exam, Extra-Mural Writing Committee, American Board of Neurological Surgeons
Grant Application Review Committee (Cranial and Spine Research), Department of Neurological Surgery, University of Pittsburgh School of Medicine

Honors and Awards
Distinguished Alumni, University of Virginia Summer Medical and Dental Education Program
Pittsburgh’s Best Doctors, Pittsburgh Magazine, 2016-17
Best Doctors of America, 2016-17
John H. Moe Award for Best Basic Research E-Poster Paper, 2016, Scoliosis Research Society Congress of Neurological Surgeons Paper of the Year Runner Up Award, Co-author, 2017

**Publications: 2016-17**

- **Refereed Articles:**
  


• Presentations:


Invited Lectures: 2016-17
• National:


Luke C. Henry, PhD
Assistant Professor

Luke Henry, PhD, joined the Department of Neurological Surgery in November of 2015. Dr. Henry completed his doctorate in clinical neuropsychology, specializing in research and intervention, at the Université de Montréal in 2011. He then moved to Pittsburgh where he completed a post-doctoral fellowship at the UPMC Sports Concussion Program. Dr. Henry worked for two years as a clinical instructor within the concussion program before joining the Department of Neurological Surgery. In his current role, Dr. Henry is responsible for pre- and post-operative neuropsychological testing for a variety of pathologies/conditions including movement disorders, epilepsy, Chiari malformations, brain tumors and post-TBI assessments. He is also actively involved with various research endeavors with other faculty members within the department.

Specialized Areas of Interest
Neuropsychological function, clinical outcomes.

Hospital Privileges
UPMC Presbyterian
UPMC Shadyside

Professional Organization Membership
National Academy of Neuropsychology
Sports Neuropsychology Society

Education & Training
BS, Psychology, University of Calgary, 2003
MS, Behavioral Neuroscience, University of Calgary, 2006
PhD, Clinical Neuropsychology, Université de Montréal, 2011
Fellowship, Clinical Neuropsychology, UPMC, 2013

Publications: 2016-17
• Refereed Articles:


Esther Jane, PhD
Research Assistant Professor

Esther Jane, PhD, graduated from Madurai Kamaraj University in India. She did her post doctoral training in Case Western Reserve University in Cleveland, Ohio, on the molecular mechanisms underlying regulation of homeotic gene expression during Drosophila development. Before joining the University of Pittsburgh Department of Neurological Surgery, she worked in the Pittsburgh Development Center in studying the cell biology of human embryonic stem cells before and after differentiation towards neuronal lineage. Dr. Jane is currently working on a project examining compounds that inhibit the function of individual kinases using diverse panel of malignant glioma cell lines.

Specialized Areas of Interest
Mode of action of multi-target tyrosine kinase inhibitors in glioma cells.

Professional Organization Membership
American Association For Cancer Research

Education & Training
BSc, Zoology, Sarah Tucker College, 1983
MSc, Zoology, The American College, 1986
PhD, Biology, The Madurai Kamaraj University, 1992

Editorial Service
• Ad Hoc Reviewer:
Cancer Letters

Publications: 2016-17
• Refereed Articles:


Brian Jankowitz, MD
Assistant Professor
Co-Director, Endovascular Therapy
Director, Neuroendovascular Fellowship Program

Brian Jankowitz, MD, joined the Department of Neurological Surgery faculty as an assistant professor on July 1, 2010 after completing the department’s seven-year residency program and cerebrovascular fellowship. This unique skill set allows unbiased treatment options ranging from carotid stenting versus carotid endarterectomy, aneurysm coiling versus clipping, and AVM embolization versus resection. Dr. Jankowitz has a keen interest in treating ischemic cerebrovascular disease including carotid or vertebral artery revascularization and acute stroke interventions. He believes a combination of open and endovascular means, working synergistically, holds the key to improving outcomes. He works closely with Tudor Jovin, MD, director of the UPMC Stroke Institute, to evaluate and treat hemorrhagic and
ischemic disease in a multidisciplinary cerebrovascular clinic at UPMC Mercy. Originally from Montgomery County, Maryland, Dr. Jankowitz received his medical training at Temple University in Philadelphia and received his undergraduate degree from the University of Notre Dame.

**Specialized Areas of Interest**
Vascular neurosurgery

**Hospital Privileges**
- Children’s Hospital of Pittsburgh of UPMC
- UPMC Magee
- UPMC Mercy
- UPMC Passavant
- UPMC Presbyterian
- UPMC St. Margaret
- UPMC Shadyside

**Professional Organization Membership**
- Allegheny County Medical Society
- American Association of Neurological Surgeons/Cerebrovascular Section
- American Heart Association: Stroke Council
- Congress of Neurological Surgeons
- Pennsylvania Medical Society
- Pennsylvania State Neurosurgical Society

**Education & Training**
- BS, Biology, Notre Dame, 1999
- MD, Temple, 2003
- Fellowship, Vascular, University of Pittsburgh, 2009
- Residency, University of Pittsburgh, 2010

**Editorial Service**
- **Editorial Board:**
  - Biomaterials & Biomedical Engineering
  - Neurology & Neurosciences
  - Austin Journal of Clinical Neurology
- **Ad Hoc Reviewer:**
  - Clinical Medicine & Research
  - European Radiology
  - Interventional Neurology
  - Journal of Neuroimaging
  - Journal of NeuroInterventional Surgery
  - Neuro-Ophthalmology
  - Neurosurgery
  - The Spine Journal
  - World Neurosurgery
  - Yonsei Medical Journal

**Professional Activities**
- Scientific Program Coordinator for the 2016 Congress of Neurological Surgeons CV sub-section meeting
Scientific Program Coordinator for the 2017 American Association of Neurological Surgeons CV sub-section meeting
Scientific Program Coordinator for the 2016 Pennsylvania Neurosurgical Society meeting

**Media Appearances: 2016-17**

**Publications: 2016-17**
- **Refereed Articles:**

**Wenyan Jia, PhD**
*Research Assistant Professor*

Wenyan Jia, PhD, received her PhD in biomedical engineering from Tsinghua University, China, in 2005 before joining the University of Pittsburgh as a postdoctoral scholar. In 2009, she was promoted to research assistant professor in the Department of Neurological Surgery.

**Specialized Areas of Interest**
Biomedical signal and image processing; wearable electronic device; mobile health.

**Professional Organization Membership**
IEEE Engineering in Medicine & Biology Society
Education & Training
BS, Biomedical Engineering, Capital University of Medical Sciences, 1998
MS, Biomedical Engineering, Capital University of Medical Sciences, 2001
PhD, Biomedical Engineering, Tsinghua University, 2005
Postdoc, Neurosurgery, University of Pittsburgh, 2008

Editorial Service
• Ad Hoc Reviewer:
  Computers in Biology and Medicine
  IEEE Journal of Biomedical and Health Informatics
  IEEE Transactions on Biomedical Engineering
  Signal Processing: Image Communication

Publications: 2016-17
• Refereed Articles:


• Presentations:


Hideyuki Kano, MD, PhD
Research Associate Professor
Director, Clinical Research, Center for Image-Guided Neurosurgery

Hideyuki Kano, MD, PhD, joined the faculty in the Department of Neurological Surgery Center for Image-Guided Neurosurgery in 2008 as a visiting research assistant professor and is now a research associate professor in the department. He was named clinical research director at the center in 2014. Dr. Kano received his medical training from the Shiga University of Medical Science in Otsu, Japan, earning his medical degree in 1997. He subsequently received his residency training at the Kyoto University School of Medicine, Kyoto, Japan and Osaka Saiseikai Izuo Hospital, Osaka, Japan in 2000. From 2000 to 2004, he received his
residency training and then fellowship program of stereotactic radiosurgery and received a certificate of board of neurological surgery in Japan in 2004. In 2006, Dr. Kano received his PhD from the Graduate School of Medicine Kyoto University, Kyoto, Japan. From 2004 to 2007, Dr. Kano worked as a neurosurgeon-in-chief at Kishiwada City Hospital in Japan. He completed his fellowship program of image-guided neurosurgery at the University of Pittsburgh in 2008. In 2009, Dr. Kano received the National Brain Tumor Society Mahaley Clinical Research Award from the Joint Section on Tumors of the AANS/CNS. In 2012, Dr. Kano received the Integra Foundation Award from the Joint Section on Tumors of the AANS/CNS. In 2013, Dr. Kano received the Leksell Radiosurgery Award from the AANS and the Synthes Skull Base Surgery Award from the CNS. Dr. Kano is currently working on a clinical study about stereotactic radiosurgery for benign and malignant brain tumors, arteriovenous malformation and functional disease. He has published more than 100 articles in refereed journals, 32 book chapters and/or invited publications, and has edited one book.

Specialized Areas of Interest
Gamma Knife stereotactic radiosurgery; malignant and benign brain tumors; vascular malformations; functional disorders.

Board Certifications
Japanese Board of Neurological Surgery

Professional Organization Membership
AANS/CNS Joint Section on Tumors
Congress of Neurological Surgeons
International Stereotactic Radiosurgery Society
Japanese Society of Neurosurgery
Japanese Society of Stereotactic Radiosurgery
The Japan Society of Neuro-Oncology

Education & Training
MD, Shiga University of Medical Science, 1997
PhD, Kyoto University Graduate School of Medicine, 2004
Residency, Neurosurgery, Kyoto University Hospital, 2004
Fellowship, Center for Image-Guided Neurosurgery, University of Pittsburgh, 2008

Editorial Service
• Editorial Board:
  BMC Neurology
  Scientific Reports

• Ad Hoc Reviewer:
  American Journal of Neuroradiology
  American Journal of Case Reports
  BMJ Open
  BMJ Case Reports
  Cancer Research
  CNS Oncology
  Cancer Biology & Medicine
  Expert Review of Anticancer Therapy
  Expert Review of Medical Devices
  International Journal of Case Reports in Medicine
  International Journal of Molecular Sciences
Faculty Biographies

Hideyuki Kano, MD, PhD

International Journal of Radiation Oncology, Biology, Physics
Journal of Clinical Medicine and Research
Journal of Clinical Oncology
Journal of Neurosurgery
Journal of Pediatric Neuroradiology
Journal of Pregnancy
Journal of Zhejiang University SCIENCE B - Biomedicine & Biotechnology
Medical Imaging and Radiology
New England Journal of Medicine
Pain Management
Technology in Cancer Research and Treatment
QJM: An International Journal of Medicine
World Neurosurgery

Honors and Awards
Integra Foundation Award, AANS/CNS Joint Section on Tumors, 2012
Leksell Radiosurgery Award, AANS, 2013
Marquis Who’s Who in America, 2014-16
National Brain Tumor Society Mahaley Clinical Research Award, 2009
Osaka Medical Research Foundation for Incurable Diseases Grant Award, 2007-09, 2011-12
Synthes Skull Base Surgery Award, AANS/CNS Joint Section on Tumors, 2013

Publications: 2016-17
• Refereed Articles:
Faculty Biographies

Hideyuki Kano, MD, PhD


Berkowitz O, Han YY, Talbott EO, Iyer AK, Kano H, Kondziolka D, Brown MA, Lunsford LD.
Gamma Knife Radiosurgery for Vestibular Schwannomas and Quality of Life Evaluation.

**Invited Lectures: 2016-17**

- **International:**

**Adam S. Kanter, MD**

*Associate Professor*

*Chief, UPMC Presbyterian Spine Service*

*Director, Minimally Invasive Spine Program*

*Co-Director, Spine Fellowship Program*

Adam S. Kanter, MD joined the faculty of the Department of Neurosurgery in January of 2008 as director of the department’s minimally invasive spine program. Dr. Kanter performed his undergraduate work at the University of Massachusetts in Amherst, graduating with Cum Laude honors. He obtained his masters degree from Boston University and his medical degree from the University of Vermont in 2001. Dr. Kanter then completed his neurosurgical residency at the University of Virginia in 2007. He completed subspecialty fellowship training in minimally invasive spine surgery at the University of California in San Francisco and Auckland City Hospital in Auckland, New Zealand. Dr. Kanter is board certified in neurological surgery and was promoted to associate professor in 2013. He was named chief of spine services in 2014 and continues to push the surgical envelope in minimally invasive spine procedures utilizing many of the innovative portals that he has helped to develop. Dr. Kanter is principal investigator in several research studies evaluating the use of stem cell derived biologics to induce spinal fusion. His research focuses on patient derived clinical outcome measures, specifically appraising the utility of minimally invasive and lateral access surgical corridors. Dr. Kanter has published numerous papers in refereed journals and authored several book chapters. He provides editorial service to several peer reviewed journals and is a key member of several major neurosurgical societies. He resided as chairman of the 2016 Spine Summit’s Scientific Program, recording the highest attendance in the history of the section’s conference. Dr. Kanter has also received numerous accolades for his clinical expertise, including top doctor, most compassionate doctor, and patient’s choice awards.

**Specialized Areas of Interest**

- Minimally invasive spine surgery; lateral access spine surgery; artificial disc technology; spinal tumors; experimental therapies for spinal fusion.

**Board Certifications**

American Board of Neurological Surgery

**Hospital Privileges**

Magee-Womens Hospital of UPMC
UPMC Passavant
UPMC Presbyterian
UPMC St. Margaret
UPMC Shadyside
Faculty Biographies

Adam S. Kanter, MD

Professional Organization Membership
AANS/CNS Joint Section on Spine & Peripheral Nerves
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Society of Lateral Access Surgeons
Society of Minimally Invasive Spine Surgeons

Education & Training
BS, Psychology, University of Massachusetts, 1993
MS, Medical Sciences, Boston University, 1997
MD, University of Vermont, 2001
Residency, Neurosurgery, University of Virginia, 2007

Editorial Service
• Editorial Board:
The Physician & Sports Medicine
International Journal of Spine Surgery
SpineLine

• Ad Hoc Reviewer:
The Spine Journal
Neurosurgical Focus
Neurosurgery
Journal of Neurosurgery

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
Medical Executive Committee
Surgical Value Analysis Team

Professional Activities
AANS/CNS Division of Spine & Peripheral Nerves:
Secretary
Annual Meeting Chair
Scientific Program Chairman
Executive Committee Member
Course Faculty, Thoracolumbar: Trauma, Tumor and Degenerative: Case-Based Presentations, Congress of Neurological Surgeons Annual Meeting, San Diego, Calif., September 25, 2016.
Course Director, Moderator & Lecturer, Breakfast Symposia: Advanced Lateral Transpsoas MIS Techniques: Expanding LLIF Indications, American Association of Neurological Surgeons Annual Meeting, Los Angeles, Calif., April 22-26, 2017.
Faculty Biographies

Adam S. Kanter, MD


Honors and Awards

Early Achievement Award, University of Vermont School of Medicine, 2016
Best Doctors in America, 2009-17
Pittsburgh’s Best Doctors, Pittsburgh Magazine, 2012-17
Patients’ Choice Award, October 2012-17
Top 10 Doctor, Vitals Neurosurgical Specialists, 2012-17
Most Compassionate Doctor Award, December 2012, 2017

Publications: 2016-17

• Refereed Articles:


Faculty Biographies


Invited Lectures: 2016-17
• National:


Faculty Biographies


David L. Kaufmann, MD
Clinical Assistant Professor
Chief, Neurosurgery, UPMC Mercy

Dr. Kaufmann is clinical assistant professor of neurological surgery at the University of Pittsburgh School of Medicine and is chief of neurosurgery at UPMC Mercy. He maintains a general neurosurgery practice with an emphasis on treating degenerative disorders of the spine and traumatic injuries of the brain and spine. He also has an interest in complex spinal reconstructive surgery for conditions involving spinal deformity and brain tumors. Dr. Kaufmann received his medical degree from the Albert Einstein College of Medicine in New York City and completed a general surgery internship at the Johns Hopkins Hospital in Baltimore. He performed his neurosurgical residency at Montefiore Medical Center and the Hyman-Newman Institute for Neurology and Neurosurgery at Beth Israel Medical Center in New York City. He is board certified in neurological surgery. Dr. Kaufmann is a member of the American Association of Neurological Surgeons, the Congress of Neurological Surgeons and the Pennsylvania Neurosurgical Society.

Specialized Areas of Interest
Spinal decompression and fusion surgery; complex spine surgery; brain and spine trauma; brain tumors; neurosurgical treatment of pain.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
Monongahela Valley Hospital
UPMC Mercy

Professional Organization Membership
Allegheny County Medical Society
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Pennsylvania Neurosurgical Society

Education & Training
BA, Philosophy, Emory University, 1989
MA Candidate, Columbia University, 1990
MD, Albert Einstein College of Medicine, 1994
Residency, Montefiore Medical Center, 2000
Residency, Beth Israel Medical Center, 2000
Gary Kohanbash, PhD
Assistant Professor

Gary Kohanbash, PhD, joined the faculty of the Department of Neurological Surgery at Children’s Hospital of Pittsburgh of UPMC in January of 2017. Dr. Kohanbash graduated from the University of Pittsburgh in 2007 with a bachelor of science honors degree in neuroscience, specializing in neurodegenerative diseases. He then earned his masters of science degree in infectious diseases and microbiology in 2009, and a doctorate in philosophy in 2012, both from the University of Pittsburgh Graduate School of Public Health. While there, he identified novel pathways of immunosuppression in gliomas and participated in multiple phase I/II immunotherapy clinical trials. Dr. Kohanbash subsequently completed a post-doctoral fellowship in the University of Pittsburgh Department of Neurological Surgery in 2014. He continued his training as a postdoctoral fellow at the University of California, San Francisco (UCSF) Department of Neurological Surgery. While at UCSF, Dr. Kohanbash was privileged to complete a prestigious T32 training program in translational brain tumor research.

Specialized Areas of Interest
Immunotherapy for pediatric and adult central nervous system tumors.

Professional Organization Membership
American Association for Cancer Research
Society for Immunotherapy of Cancer
Society for Neuro-Oncology

Education & Training
BS (hons), Neuroscience, University of Pittsburgh, 2007
MS, Infectious Diseases and Microbiology, University of Pittsburgh, 2009
PhD, Brain Tumor Immunology, University of Pittsburgh, 2012
Postdoctoral Fellow, Neurological Surgery, University of Pittsburgh, 2014
Postdoctoral Fellow, Neurological Surgery, University of California, San Francisco, 2016

Editorial Service
• Editorial Board:
New Journal of Science: Immunology

• Ad Hoc Reviewer:
Cytometry
ImmunoOncology
JAMA Neurology
Journal of Clinical Investigation
Neuro-Oncology

Honors and Awards
Research Travel Award, Society for Immunotherapy of Cancer, 2014-15
Honoree, The Annual Convocation of the University of Pittsburgh, 2010, 2014
Best Dissertation Award, Department of Infectious Diseases and Microbiology, University of Pittsburgh, 2013
Top Oral Presentation, Translational Research Cancer Center Consortium (TRCCC), 2013
International Research Travel Award, Japanese Society for Brain Tumor Pathology, 2012
Best Graduate Thesis Award, Department of Infectious Diseases and Microbiology, University of Pittsburgh, 2010
Top Poster Award, Translational Research Cancer Center Consortium (TRCCC), 2009
Publications: 2016-17
• Refereed Articles:

• Presentations:

L. Dade Lunsford, MD
Lars Leksell Distinguished Professor
Director, Center for Image-Guided Neurosurgery
Director, Residency Training Program

L. Dade Lunsford, MD, is the Lars Leksell Professor and Distinguished Professor at the Department of Neurological Surgery at the University of Pittsburgh. He is also director of the Center for Image-Guided Neurosurgery at the University of Pittsburgh Medical Center and an internationally recognized authority on stereotactic surgery, radiosurgery, and minimally invasive surgery. In 1987, Dr. Lunsford was responsible for bringing the Gamma Knife to the University of Pittsburgh Medical Center, the first center in the United States to offer this state-of-the-art, minimally invasive form of brain surgery. Dr. Lunsford received his medical degree in 1974 from the Columbia University College of Physicians and Surgeons. He completed his internship in surgery at the University of Virginia Hospital and his residency in neurological surgery at the University of Pittsburgh. Following a one-year fellowship in stereotactic and functional neurosurgery at the Karolinska Institute in Stockholm, Sweden—studying with professors Lars Leksell and Erik-Olof Backlund—he joined the Department of Neurological Surgery faculty in 1981. He is an active staff member of several UPMC hospitals and was president of the medical staff at UPMC Presbyterian from 1999-2001 and past president of the Council of Clinical Chairs for the University of Pittsburgh School of Medicine in 2001-2003. Dr. Lunsford chairs the UPMC Health System Technology and Innovative Practice committee and co-chairs the UPMC Brain Mapping (MEG) Center. Dr. Lunsford has been board-certified by the American Board of Neurological Surgery since 1983. He is the author of 628 published articles and 284 book chapters as well as the editor or co-editor of twelve books. Dr. Lunsford also served as department chairman for ten years, stepping down in July of 2006 to devote more time to his clinical work, clinical investigation, and resident and fellow training. Since 2012 he has served as a team physician (neurosurgeon) for the National Hockey League’s Pittsburgh Penguins.

Specialized Areas of Interest
Brain tumor management; Gamma Knife stereotactic radiosurgery; movement disorders and trigeminal neuralgia; vascular malformations; concussion and sports medicine.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
UPMC Presbyterian
UPMC St. Margaret’s
UPMC Shadyside
**Professional Organization Membership**

AANS/CNS Joint Section for Stereotactic and Functional Neurosurgery (chair, 1995-97)
Allegheny County Medical Society
American Academy of Neurological Surgery
American Association of Neurological Surgeons, Fellow
American College of Surgeons, Fellow
American Society for Stereotactic and Functional Neurosurgery (president, 1995-97)
Congress of Neurological Surgeons
Florida Medical Association
Focused Ultrasound Surgery Foundation, Data Safety Monitoring Board
International Gamma Knife Research Foundation, Chairman
International Radiosurgery Association, Chairman, Medical Advisory Board
North American Skull Base Society
Pennsylvania Medical Society
Pennsylvania Neurosurgical Society
Society of Neurological Surgeons
World Society for Stereotactic and Functional Neurosurgery

**Education & Training**

BA, University of Virginia, 1970
MD, Columbia University, 1974
Internship, General Surgery, University of Virginia, 1975
Residency, University of Pittsburgh, 1980
Fellowship, Stereotactic and Functional Neurosurgery, Karolinska Sjukhuset, 1981

**Editorial Service**

- **Editorial Board:**
  - Egyptian Journal of Neurological Surgery
  - Progress in Neurological Surgery (Editor)
  - Stereotactic and Functional Neurosurgery
  - Surgical Neurology International

- **Ad Hoc Reviewer:**
  - Acta Neurologica Scandinavica
  - American Journal of Otology
  - British Journal of Neurosurgery
  - Cancer
  - International Journal of Radiation Oncology, Biology and Physics
  - Journal of Neurosurgery
  - Neurosurgery

**Interdepartmental and Medical Center Activities**

- **UPMC Presbyterian:**
  - Director, Center for Image Guided Neurosurgery
  - Co-Chair, Brain Mapping (MEG) Center, 2009-present

- **UPMC:**
  - Director, Neurological Surgery Residency Program, 1994-present
  - Chair, Technology and Innovative Practice Committee
  - Value Analysis Executive Steering Committee
L. Dade Lunsford, MD

**University of Pittsburgh:**
University of Pittsburgh Radiation Safety Committee

**Professional Activities**
Course Co-Director, Principles and Practices of Gamma Knife Radiosurgery, Pittsburgh Pa.,
(six courses per year)
Chair and Founder, International Gamma Knife Radiosurgery Foundation
Team Co-Neurosurgeon, Pittsburgh Penguins, National Hockey League

**Honors and Awards**
BA with High Honors - University of Virginia, 1970
Phi Beta Kappa - University of Virginia, 1970
William P. Van Wagenen Fellowship, AANS, 1980
*Good Housekeeping* Best Doctors, 1996
International Stereotactic Radiosurgery Jacob Fabrikant Award, 1997
William S. McEllroy Award, University of Pittsburgh School of Medicine, 1997
Faculty Teaching Award, Department of Neurosurgery 1997, 1999, 2000, 2010
Lars Leksell Provost Lecture, 2000
America’s Top Doctors, Castle Connolly Medical, Ltd., 2002-16
AANS Young Neurosurgeon Award, 2005
Academic Keys *Who’s Who in Medical Sciences Education*, 2005
Best Doctors in America, 2005-16
Guide to America’s Top Surgeons, 2006-09
Distinguished Professor, University of Pittsburgh, 2007
Congress of Neurological Surgeons Honored Guest, 2007
Allegheny County Medical Society Ralph C. Wilde Award, 2008
Castle Connolly Medical Ltd. National Physician of the Year Award, 2008
Pioneers in Radiosurgery Award, Leksell Gamma Knife Society, 2010
Leading Health Professionals of the World, 2010
America’s Top Doctors for Cancer, Castle Connolly Medical, Ltd., 2005-16
Best Doctors in America database, 2010-2016
Pittsburgh’s Best Doctors, *Pittsburgh Magazine*, 2012-17
American Most Honored Professionals, Top 1%, 2016
AANS Cushing Award for Technical Excellence and Innovation in Neurosurgery, 2016

**Media Appearances: 2016-17**
“Proud to be from Pittsburgh: UPMC medical student,” August 5, 2016, WPXI-TV *Evening News*.
“Treated for a brain tumor at 16, VCOM student rotates with his former neurosurgeon,”


Faculty Biographies

L. Dade Lunsford, MD

Publications: 2016-17

• Refereed Articles:


Faculty Biographies


Faculty Biographies


**Book Chapters:**

**Presentations:**

**Invited Lectures: 2016-17**

**National:**

Lunsford LD. "Radiosurgery for Trigeminal Neuralgia" Cleveland Clinic Annual International Symposium on SBRT and Stereotactic Radiosurgery, Lake Buena Vista, Fla., February 24, 2017.

Lunsford LD. "Radiosurgery for Movement Disorders: Back to the Future." Northwell Health Annual Stereotactic Radiosurgery Meeting: Focus on Functional Radiosurgery, North Shore University Hospital, Manhassett, N.Y., March 24, 2017.

Lunsford LD. "Radiosurgery vs. Surgery for the Treatment of Movement Disorders." Moderator. Northwell Health Annual Stereotactic Radiosurgery Meeting: Focus on Functional Radiosurgery, North Shore University Hospital, Manhassett, N.Y., March 24, 2017.


**Local/Regional:**
Lunsford LD. "Brain Biopsy: When the Neurologist Calls." Joint Neurology/Neurosurgery Conference, University of Pittsburgh, Pittsburgh, Pa., January 25, 2017


Lunsford LD. “Radiosurgery for Acoustic Neuromas.” AANS/ASTRO Stereotactic Radiosurgery Course for Neurosurgery and Radiation Oncology Residents, University of Pittsburgh Medical Center, Pittsburgh, PA. June 10, 2017

Joseph C. Maroon, MD
Clinical Professor, Heindl Scholar in Neuroscience
Vice Chair, UPMC Community Medicine
Director, Tri-State Neurosurgical Associates

Joseph C. Maroon, MD, is a board-certified clinical professor of neurological surgery at the University of Pittsburgh Medical Center, and the Heindl Scholar in Neuroscience. He obtained his medical and neurosurgical training at Indiana University, Georgetown University, Oxford University in England and the University of Vermont. His clinical and research interests have been in the areas of the development of minimally invasive surgical procedures to the brain and spine, the prevention and treatment of traumatic injuries to the central nervous system, innovative approaches to pituitary and other brain tumors and more recently complimentary approaches to inflammatory diseases associated with aging. Working with neuropsychologist, Mark Lovell, PhD, he co-developed ImPACT® (Immediate Post-Concussion Assessment and Cognitive Testing). This is the first computerized system to determine concussion severity and the timing for return to contact sports. It is now the standard of care for concussion management in the National Football League, National Hockey League, Major League Baseball, NASCAR and is used in over 12,000 colleges and high schools in the United States. For over 20 years he has served as the neurosurgical consultant to professional and college athletes in football, baseball, golf, hockey and soccer and has been the team neurosurgeon to the Pittsburgh Steelers for 20 years. He has been honored by the neurosurgical societies of Japan, Korea, Thailand, Egypt, Brazil, Lebanon and China for his neurosurgical contributions. He was honored by his peers when he was elected president of the Congress of Neurological Surgeons, the largest society of neurosurgeons in North America. Other outside activities include a member of the board of directors and chairman of the scientific and technology committee of Mylan Laboratories, the third largest generic drug manufacturer in the world; chairman of the scientific advisory board to General Nutrition Corporation (GNC); and, chairman of the medical and scientific advisory board to Stemedaica. He also serves on the NFL Head, Neck and Spine Committee and, in 2008, he became medical director of the World Wrestling Entertainment Corporation (WWE). Also in 2008, he was named senior vice president of the American Academy of Anti-Aging Medicine (A4M). Honored as one of America’s best neurosurgeons for 12 consecutive years he has written over 250 papers, 40 book chapters and five books. His most recent book, published in February of 2017, is entitled Square One: A Simple Guide to a Balanced Life that takes a look at the importance of understanding where you are in life and the need to keep all elements of your life in proper “balance.” He has also authored Fish Oil: The Natural Anti-Inflammatory, published in 2006, and The Longevity Factor: How Resveratrol and Red Wine Activate Genes for Longer and Healthier Life, published in 2008. In his early years, his athletic abilities earned him a football scholarship to the University of Indiana in Bloomington where he was selected as Scholastic All-American in football. Despite his busy professional schedule, Dr. Maroon remains an avid athlete and has competed in over 74 triathlon events. These
Facility Biographies

Joseph C. Maroon, MD

include eight Ironman distant triathlons (2.4 mile swim, 112 mile bike and 26.2 run) in Hawaii (1993, 2003, 2008, 2010 and 2013), Canada (1995), New Zealand (1997) and Europe (2000). He placed sixth in the Senior U.S. Olympics Triathlon in 2005. In 1999, he—along with Joe Montana and Kareem Abdul Jabbar—was inducted into the Lou Holtz Upper Ohio Valley Hall of Fame for his athletic accomplishments and contributions to sports medicine. On May 2, 2009, he was inducted into the Western Pennsylvania Sports Hall of Fame, and on March 14, 2010, he was inducted into the National Fitness Hall of Fame in Chicago. As medical director of the Live Free African Freedom Tour, on February 26, 2014, Dr. Maroon and his daughter, Isabella—along with a group of amputees—climbed Mt. Kilimanjaro in Africa, the highest free standing mountain in the world. In May of 2015 Dr. Maroon completed The Crucible Extreme Hike, a three-day, 70-mile hike in the Laurel Mountains of Pennsylvania to raise awareness for wounded veterans.

Specialized Areas of Interest
Microdiscectomy; lumbar laminectomy; anterior cervical discectomy; Arnold-Chiari Malformation; pituitary tumors; orbital tumors; acoustic tumors; brain tumors; concussion; sports medicine.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
UPMC Passavant
UPMC Presbyterian
UPMC St. Margaret
Sewickley Valley Hospital
Wheeling Hospital

Professional Organization Membership
Allegheny County Medical Society
American Academy of Anti-Aging Medicine
American Association of Neurological Surgeons
American College of Sports Medicine
American College of Surgeons
American Medical Association
Congress of Neurological Surgeons
Mid-Atlantic Neurosurgical Society
National Association for Disabled Athletes
National Football League Physicians Society
Neurosurgical Society of America
Pennsylvania Medical Society
Pennsylvania Neurosurgical Society
Research Society of Neurological Surgeons
Society of Neuroscience

Education & Training
AB, Anatomy & Physiology, Indiana University, 1961
MD, Indiana University, 1965
Residency, General Surgery, Georgetown University, 1967
Residency, Neurological Surgery, Indiana University, 1968
Residency, Neurological Surgery, Oxford University, 1969
Fellowship, Vermont College of Medicine, 1972
Faculty Biographies

Joseph C. Maroon, MD

Editorial Service

• Editorial Board:
  Anti-Aging News Journal
  Neurological Research
  The Physician and Sportsmedicine
  Surgical Neurology International
  The Turkish Journal of Neurosurgery

• Ad Hoc Reviewer:
  Annals of Otology, Rhinology and Laryngology
  Chinese Journal of Neural Regeneration Research
  European Journal of Pain
  Journal of Cranial Base Surgery
  Journal of Neurotrauma
  Journal of the American College of Surgeons
  Neurology India
  Neurosurgery
  Stroke
  Surgical Neurology
  Spine Surgery Today
  World Neurosurgery

Professional Activities

Team Neurosurgeon, Pittsburgh Steelers
Scientific Advisory Board, General Nutrition Corporation
Board of Directors, Mylan Laboratories
Medical Director, WWE
Senior Vice President, American Academy of Anti-Aging Medicine (A4M)
Senior Advisor, NFL Head, Neck and Spine Committee
World Advisory Board of the International Sports Hall of Fame
Board of Directors, Phipps Conservatory
Chairman, Science and Technology Committee of Mylan Labs
Chairman, Medical and Scientific Advisory Board, Stemedica
Consulting Neurosurgeon, Operation Backbone

Honors and Awards

Lou Holtz/Upper Ohio Valley Hall of Fame inductee, for excellence in athletics and medicine, June 1999.
Western Pennsylvania Chapter of the Sports Hall of Fame, May 2, 2009.
Distinguished Alumni Service Award, Indiana University, November 4, 2011.
Ohio Valley Athletic Conference Hall of Fame Class of 2012, August 18, 2012.
Pioneer Award, 25th Anniversary UPMC Center for Cranial Base Surgery, Pittsburgh, Pa., November 17, 2012.
Faculty Biographies

Joseph C. Maroon, MD

**Media Appearances: 2016-17**

“Steelers’ Neurosurgeon Maps Out Guide To A Balanced Life In ‘Square One,’” February 14, 2017 KDKA Radio Morning News


“Steelers form brain injury foundation named after coach Chuck Noll,” November 17, 2016, Pittsburgh Tribune-Review

“Brain health emphasized at Beaver Meadows care facility,” November 7, 2016, Beaver County Times

**Publications: 2016-17**

• Refereed Articles:


• Books:

Vincent J. Miele, MD

**Clinical Assistant Professor**

Vincent J. Miele, MD, joined the University of Pittsburgh Department of Neurosurgery as a clinical assistant professor on January 1, 2014. He is the former director of the neurosurgical spine service at West Virginia University. Dr. Miele received his undergraduate degree at Northeastern University in Boston where he graduated summa cum laude and was inducted into the Rho Chi Academic Pharmacy Honor Society as well as the Phi Kappa Phi Honor Society. He was also awarded the Northeastern University Alumni of the Year President’s Award in 2001. Dr. Miele completed medical school and his neurosurgical residency at West Virginia University where he was elected to the medical honor society Alpha Omega Alpha and won the Gandee-Massey Award based on academic achievement. He is fellowship-trained in complex spine surgery from Cleveland Clinic Foundation, where he remains adjunct faculty in the Spine Research Laboratory. Dr. Miele’s research has encompassed such areas as spinal biomechanics, concussion management and return to play, as well as accelerometer and MEMs technology translation into clinical applications. He has published more than 30 papers in refereed journals, authored 20 book chapters, and has presented scientific lectures both nationally and internationally. His research has lead to invited written editorials in prominent media such as the New York Times. He has been actively involved in the Congress of Neurological Surgeons, American Association of Neurological Surgery, and North American Spine Society and is an ad hoc reviewer for various journals. Dr. Miele’s major clinical interests embrace many aspects of neurosurgery, but are focused on spinal disorders including pathologies associated with degeneration and trauma, complex spinal instrumentation, revision spinal surgery, and spinal tumors. His areas of expertise include minimally invasive spine surgery and the newer motion preservation technologies as well
as the larger surgeries required for conditions such as adolescent/adult spinal deformity and
the multidisciplinary treatment of spinal tumors. Dr. Miele also has a strong background in
cranial neurosurgery and treats peripheral nerve conditions such as carpal tunnel syndrome.
Dr. Miele frequently evaluates and manages sports-related head and spine injuries, and
works at a national level with athletes on return to play issues. He is involved in the develop-
ment of devices used to detect and prevent concussion and is frequently invited to speak on
this subject nationally. He also is an independent neurosurgical consultant for the National
Football League and the Pittsburgh Steelers. He is licensed to practice in Pennsylvania, Ohio,
and West Virginia and has established clinics in Beaver Falls, Greenville, Monroeville, Mt.
Morris and Wexford in Pennsylvania, and Wheeling in West Virginia.

Specialized Areas of Interest
Spinal disorders and injuries, spine tumors, revision spinal surgery, adult deformity/scolio-
sis surgery, sports-related brain and spine injuries, peripheral nerve disorders, and spinal
fusions.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
UPMC Mercy
UPMC Passavant
UPMC Presbyterian
UPMC Shadyside

Professional Organization Membership
Alpha Omega Alpha Medical Honor Society
American Association for the Improvement of Boxing
American Association of Neurological Surgeons
American Association of Professional Ringside Physicians
American College of Sports Medicine
Congress of Neurological Surgeons
International Federation of Sports Medicine
North American Spine Society
Ohio State Medical Society
Pennsylvania State Medical Society
United States Amateur Boxing Ringside Physicians
West Virginia State Medical Society

Education & Training
MD, West Virginia University, 2001
Residency, West Virginia University, 2007
Fellowship, Complex Spine, Cleveland Clinic, 2008

Editorial Service
• Editorial Board:
  World Neurosurgery

• Ad Hoc Reviewer:
  BioMed Central Neurology
  Clinical Neurology and Neurosurgery
  Journal of Neurology, Neurosurgery & Psychiatry
  Neurology India
Vincent J. Miele, MD

Interdepartmental and Medical Center Activities
• UPMC Passavant:
  Credentials Committee
  Surgical Services Committee

Honors and Awards
Best Doctors in Pittsburgh, *Pittsburgh Magazine*, 2016-17

Publications: 2016-17
• Presentations:


Edward A. Monaco III, MD, PhD
Assistant Professor

Edward A. Monaco III, MD, PhD, joined the Department of Neurological Surgery faculty as an assistant professor in June of 2013 after completing the University of Pittsburgh’s seven-year neurosurgery residency program. Prior to coming to the university, Dr. Monaco earned a PhD in neuroscience and physiology at SUNY Upstate Medical University in Syracuse and his medical degree from Columbia University College of Physicians and Surgeons in New York, N.Y. He completed undergraduate degrees in biology and chemistry at LeMoyne College in Syracuse, N.Y. Dr. Monaco was born in Charleston, S.C.

Specialized Areas of Interest
Brain tumors; Gamma Knife stereotactic radiosurgery; minimally invasive spine surgery, pain neurosurgery.

Hospital Privileges
UPMC Altoona
UPMC Hamot
UPMC Mercy
UPMC Magee
UPMC Passavant
UPMC Presbyterian
UPMC Shadyside
VA Pittsburgh Healthcare System, University Drive, Pittsburgh

Professional Organization Membership
Allegheny County Medical Society
AANS/CNS Spine and Peripheral Nerve Section Member
AANS/CNS Tumor Section Member
American Association of Neurological Surgeons
American Medical Association
Edward A. Monaco III, MD, PhD

American Society of Stereotactic and Functional Neurosurgeons
Congress of Neurological Surgeons
Pennsylvania Neurosurgical Society

Education & Training
PhD, Neuroscience, SUNY, 2004
MD, Columbia University, 2006
Internship, University of Pittsburgh, 2007
Fellowship, University of Pittsburgh, Stereotactic Radiosurgery, 2012
Residency, University of Pittsburgh, 2013

Editorial Service
• Ad Hoc Reviewer:
  Biomed Research International
  BMC Surgery
  CNS Oncology
  International Journal of Molecular Sciences
  Lung Cancer Management
  Melanoma Management
  Melanoma Research
  NeuroImage

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Faculty Compensation Committee
  Resident Clinical Competency Committee Member/Promotion Evaluation Committee Member
  Team Physician, University of Pittsburgh Football Team
  Faculty Research Mentor – First Experiences in Research for Undergraduates
  Grant Review Panel, Copeland Grant Committee
  Institutional Review Board (IRB)

• UPMC Presbyterian:
  Assistant Program Director, UPMC Presbyterian Residency Program

Professional Activities
Faculty Lecturer, Principles and Practice of Gamma Knife Radiosurgery, Pittsburgh, Pa.
  (six courses per year)
Team Physician, Pittsburgh Penguins Hockey Team
Adjunct Professor, Chatham University

Community Activities
Coach, Shaler Soccer Club

Honors and Awards
Best Doctors in Pittsburgh, Pittsburgh Magazine

Publications: 2016-17
• Refereed Articles:
  Zwagerman NT, McDowell MM, Hamilton RL, Monaco EA 3rd, Flickinger JC, Gerszten PC.
Faculty Biographies


**Book Chapters:**

**Invited Lectures: 2016-17**

**National:**


**Local/Regional:**

John J. Moossy, MD  
Professor  
Director, Center for Pain Management  
Chief, Neurosurgery, VA Pittsburgh Healthcare System

John J. Moossy, MD, joined the faculty of the Department of Neurological Surgery at the University of Pittsburgh in 1986. He is now chief of neurosurgery at the Veterans Affairs Pittsburgh Healthcare System. He attended medical school at Tulane University, earning an MD degree in 1980. He completed a surgical internship and the residency program in neurosurgery at Duke University. Prior to that, he was an undergraduate student at Wake Forest University in Winston Salem, North Carolina, and at the University of Pittsburgh. His clinical practice is one of general neurosurgery with a special interest in the surgical management of medically intractable pain. Dr. Moossy's publications include 32 articles in refereed journals and nine book chapters.

Specialized Areas of Interest
The surgical treatment of intractable pain problems through neuro-augmentative and neuro-ablative procedures.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
Latrobe Area Hospital  
UPMC Presbyterian  
UPMC Shadyside  
Veterans Affairs Pittsburgh Healthcare System

Professional Organization Membership
Allegheny County Medical Association  
American Association of Neurological Surgeons (AANS)  
American Medical Association  
Carroll F. Reynolds History of Medicine Society  
Pennsylvania Medical Association  
Pennsylvania Neurosurgical Society  
Section on Pain of the AANS/CNS  
Section on Disorders of the Spine & Peripheral Nerves of the AANS/CNS  
Section on History of the AANS/CNS

Education & Training
BA, French, University of Pittsburgh, 1976  
MD, Tulane University, 1980  
Residency, Neurosurgery, Duke University, 1986

Honors and Awards
Department of Neurological Surgery, Resident Teaching Award, 2001-2003  
*Pittsburgh Magazine* Top Doctor Award, 2012-17  
Rudlof Matas Prize in History of Medicine, 1980
Faculty Biographies

John J. Moossy, MD

Publications: 2016-17
• Refereed Articles:

Ajay Niranjan, MD, MBA
Professor
Director, UPMC-Brain Mapping Center (MEG)
Associate Director, Center for Image-Guided Neurosurgery
Director, Radiosurgery Research

Ajay Niranjan, MD, is a professor of neurological surgery at the University of Pittsburgh. Dr. Niranjan received his medical training at the King George's Medical College in Lucknow, India from 1980 to 1985, graduating with a bachelor of medicine and bachelor of surgery degree. Dr. Niranjan completed general surgery residency in 1989 and neurological surgery residency 1992. Dr. Niranjan joined the University of Pittsburgh as a fellow in image-guided neurosurgery in 1997 and completed his fellowship in 2000. He joined the faculty of neurological surgery in July of 2000. Dr. Niranjan’s major research interest is the analysis of clinical outcomes gamma Knife radiosurgery for tumors, vascular malformations and functional disorders of brain. His another research interest is in the development of presurgical brain mapping using magnetoencephalography (MEG). His other research interests include development of strategies to enhance the effect of radiosurgery on brain tumors. His laboratory has studied the radiobiological effects of radiation on brain-tumor microenvironment and has evaluated the effects of radiation on neural stem cells implantation in the brain. Dr. Niranjan serves as principal investigator on the following two projects: “Multicenter Phase II Study of Border Zone Stereotactic Radiosurgery with Bevacizumab Chemotherapy in Patients with Recurrent or Progressive Glioblastoma Multiforme” and “A Safety and Feasibility Study of Minocycline Therapy for Management of Adverse Radiation Effects after Brain Metastases Radiosurgery.” He has co-authored over 170 articles in refereed journals and over 110 book chapters. Dr. Niranjan has co-edited four books and has contributed guidelines for stereotactic radiosurgery for trigeminal neuralgia, pituitary adenomas, arteriovenous malformation, acoustic tumors, and brain metastases.

Specialized Areas of Interest
Radiosurgery for benign and malignant brain tumors; radiosurgery for brain vascular malformations; radiosurgery for functional brain disorders; pre-surgical brain mapping using MEG.

Hospital Privileges
UPMC Presbyterian

Professional Organization Membership
American Clinical MEG Society
Congress of Neurological Surgeons
International Stereotactic Radiosurgery Society

Education & Training
MBBS, King George’s Medical College, 1985
Residency, General Surgery, King George's Medical College, 1989
Residency, Neurological Surgery, King George's Medical College, 1992
Fellowship, University of Pittsburgh, 2000
MBA, University of Pittsburgh, 2009
Ajay Niranjan, MD, MBA

Editorial Service
• Ad Hoc Reviewer:
  Gene Therapy
  Expert Review of Neurotherapeutics
  Interdisciplinary Neurosurgery: Advanced Techniques and Case Management
  Journal of Neurosurgery
  Neurology India
  Neurosurgery
  Radiation Oncology
  Technology In Cancer Research And Treatment (TCRT)
  World Neurosurgery
  World-Science

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Radiation Safety Committee
  Director of Operations, UPMC Brain Mapping Center
  Total Quality & Patient Safety Council

Professional Activities
Board Member, AANS and ASTRO national SRS registry
Member, International Gamma Knife Radiosurgery Foundation
Course Co-Director: Principles and Practices of Gamma Knife® Radiosurgery, Pittsburgh, Pa.,
  (six courses per year)

Honors and Awards
Top Doctors of America in 2016
Best Doctors in America® 2017

Publications: 2016-17
• Refereed Articles:
  Niranjan A, Raju SS, Kooshkabadi A, Monaco EA 3rd, Flickinger JC, Lunsford LD.

  Niranjan A, Layne D, Briercheck M, Trofimova S, Monaco EA 3rd, Kano H, Lunsford LD.

  Monserrate A, Zussman B, Ozpinar A, Niranjan A, Flickinger JC, Gersztten PC.


Faculty Biographies


• Published Abstracts:

• Presentations:


Invited Lectures: 2016-17

• International:
Faculty Biographies


- National:

- Local/Regional:
  Niranjan A. "Challenges and Logistics of Maintaining Gamma Knife Quality Registry." University of Pittsburgh, Pittsburgh, Pa., October 4, 2016.

David O. Okonkwo, MD, PhD
Professor
Executive Vice Chair, Clinical Operations
Clinical Director, Brain Trauma Research Center

David O. Okonkwo, MD, PhD, is executive vice chair for clinical operations and is director of neurotrauma, director of scoliosis and spinal deformity at UPMC Presbyterian. He is also professor and clinical director of the Brain Trauma Research Center of the University of Pittsburgh. Dr. Okonkwo completed his undergraduate work at the University of Virginia, where he received the University Academic Achievement Award and was named a Howard Hughes Undergraduate Biomedical Research Scholar. He completed his medical and doctoral education through the MD/PhD program of the Medical College of Virginia of Virginia Commonwealth University. He joined the University of Pittsburgh Department of Neurological Surgery in 2006 following completion of neurosurgical residency at the University of Virginia and a fellowship at Auckland Public Hospital, Auckland, New Zealand. He has additional specialized training in scoliosis and other spinal deformities. Dr. Okonkwo's clinical interests are traumatic injuries to the brain and spine as well as scoliosis and spinal deformity. His research endeavors involve developing advanced neuroimaging modalities and novel therapeutic interventions for brain and spinal cord injury. Dr. Okonkwo is the principal investigator of a nationally funded clinical core to study the pathophysiology of traumatic brain injury. He is also principal investigator of several ongoing clinical studies in neurotrauma in Pittsburgh. Dr. Okonkwo has published more than 120 papers in refereed journals, authored numerous book chapters, and garnered several awards for his scientific research. He is a member of the American Association of Neurological Surgeons, the Congress of Neurological Surgeons and the National and International Neurotrauma Societies.

Specialized Areas of Interest
Brain and spine trauma; scoliosis; spinal deformity; minimally invasive spine surgery; sports medicine, experimental therapies for brain and spinal cord injuries.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
Children's Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Presbyterian
UPMC Mercy
Veterans Affairs Pittsburgh Healthcare System
Faculty Biographies

David O. Okonkwo, MD, PhD

Professional Organization Membership
- Alpha Omega Alpha Medical Honor Society
- American Association of Neurological Surgeons
- Congress of Neurological Surgeons
- National Neurotrauma Society

Education & Training
- BA, Biology, University of Virginia, 1994
- MD, Virginia Commonwealth University, 2000
- PhD, Anatomy, Virginia Commonwealth University, 2000 Fellowship, Neurosurgery, Auckland Public Hospital, 2005 Residency, Neurosurgery, University of Virginia, 2006

Editorial Service
- Editorial Board: Therapeutic Hypothermia
- Ad Hoc Reviewer: Journal of Neurosurgery Journal of Neurotrauma Neurosurgery

Interdepartmental and Medical Center Activities
- UPMC Presbyterian: UPMC Presbyterian Medical Executive Trauma Medical Audit Committee
- University of Pittsburgh: Institutional Review Board Member

Professional Activities
- AANS/CNS Section on Neurotrauma and Critical Care, Executive Committee
- AANS/CNS Section on Spine and Peripheral Nerve Disorders, Program Committee

Honors and Awards
- Best Doctors in America, 2017
- Pittsburgh’s Best Doctors, Pittsburgh Magazine, 2017

Media Appearances: 2016-17
- “For this UPMC surgeon, music is an important prescription for a successful procedure,” March 1, 2017, Pittsburgh City Paper.
- “Concussions research paper a major step,” October 30, 2016, Pittsburgh Post-Gazette.
- “Pitt to lead trauma network through $90 million federal defense contract,” October 19, 2016, Pittsburgh Post-Gazette.
Publications: 2016-17

• Refereed Articles:


• Presentations:
  Okonkwo DO. “Future Directors for TBI Clinical Trials and the Promise of Hypothermia.” Annual Meeting of the Japan Neurosurgical Society, Fukuoka, Japan, October 1, 2016
  Okonkwo DO. “Targeted Treatment for TBI.” TBI and CTE Neuroscience Symposium, Dallas, Texas, May 6, 2017.

Invited Lectures: 2016-17
• International:
David O. Okonkwo, MD, PhD

Faculty Biographies

Okonkwo DO. “Future Directions for Clinical Trials in TBI.” Brazilian Congress of Neurosurgery, Brasilia, Brazil, September 8, 2016.


Okonkwo DO. “Multi-modal monitoring for TBI.” AONeuro Neurotrauma Course, Tokyo, Japan, March 11, 2017.


Okonkwo DO. “Spreading Depolarizations and Hypothermia in TBI.” Ajou University Visiting Professor Lecture, Suwon, South Korea, June 9, 2017.

Okonkwo DO. “TBI Neuroimaging: Diagnosis and Prognosis.” AONeuro Course, Suwon, South Korea, June 10, 2017.

• National:


• Local/Regional:


Faculty Biographies

- Visiting Professorships:
  Suwon University, Suwon, South Korea, “Spreading Depolarizations and Hypothermia in TBI,” June 9, 2017.

Erin Paschel, PA-C
Clinical Instructor

Erin E. Paschel, PA-C, joined the Department of Neurological Surgery as a surgical physician assistant for the Spine Services Division in 2009. She currently serves as a clinical instructor in the University of Pittsburgh School of Medicine, and she is a member of the Preceptor Academy for Advanced Practice Providers. She also is a clinical assistant professor at Chatham University where she earned her masters of physician assistant studies degree. Erin was born and raised in Pittsburgh, completing her undergraduate degree at Allegheny College and post-baccalaureate graduate studies at Duquesne University. Erin’s research interests include treating cervical disc herniations and degenerative diseases with stand-alone zero-profile devices, balloon kyphoplasty for the treatment of vertebral compression fractures, and dynamic stabilization of the lumbar spine. She also serves as the co-principal investigator of a prospective clinical investigation into decreasing surgical site infections using chlorhexidine.

Board Certifications
National Commission on Certification of Physician Assistants

Hospital Privileges
UPMC Presbyterian
UPMC Passavant

Professional Organization Membership
American Academy of Physician Assistants
American Association of Neurological Surgeons
Pennsylvania Society of Physician Assistants

Education & Training
BS, Biology, Allegheny College, 2003
Pre-Medical Program, Duquesne University, 2004
MPAS, Chatham University, 2009

Ian F. Pollack, MD
A. Leland Albright Distinguished Professor
Vice Chair, Academic Affairs
Chief, Pediatric Neurosurgery
Co-Director, Neurosurgical Oncology

Ian Pollack, MD, is co-director of the Brain Tumor Program at the University of Pittsburgh Cancer Institute, chief of Pediatric Neurosurgery at Children’s Hospital of Pittsburgh of UPMC, and A. Leland Albright Professor of Neurosurgery at the University of Pittsburgh School of Medicine. Prior to joining the faculty of the Department of Neurological Surgery at the University of Pittsburgh in 1992, he was awarded the 1991 Van Wagenen Traveling Fellowship, which afforded him a year of subspecialty training in the Department of Neurosurgery at the Hospital for Sick Children in Toronto, the Neuro-Oncology Laboratory of the University of Lausanne in Switzerland, and the Laboratory of Tumor Biology of the University of Uppsala in Sweden. Dr. Pollack graduated magna cum laude from Emory University.
in 1980, where he earned a BS degree in chemistry. He received his medical degree from the Johns Hopkins University School of Medicine in 1984, then completed a surgical internship and neurosurgical residency at the University of Pittsburgh School of Medicine. He also was a research fellow in neuropathology and neurobiology during some of that time. Pollack has published more than 330 papers in refereed journals, numerous book chapters and invited papers, and has edited two books on childhood brain tumors. He is co-editor of the book *Principles and Practice of Pediatric Neurosurgery*—currently in its third edition—and an accompanying atlas *Operative Techniques In Pediatric Neurosurgery*. He is currently a principal investigator on numerous NIH grants focusing on novel therapies for brain tumors and evaluating molecular markers of tumor prognosis. Dr. Pollack was named vice chairman of academic affairs for the department in July of 2008. He has co-chaired the National Cancer Institute Brain Malignancy Steering Committee since 2010.

**Specialized Areas of Interest**

Pediatric neurosurgery; pediatric neuro-oncology; craniofacial surgery; congenital spinal abnormalities; brain tumor clinical trials.

**Board Certifications**

American Board of Neurological Surgery
American Board of Pediatric Neurosurgery

**Hospital Privileges**

Children’s Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Presbyterian

**Professional Organization Membership**

Academy of Neurological Surgeons
Alpha Omega Alpha
American Association for the Advancement of Science
American Association for Cancer Research
American Association of Neurological Surgeons (AANS)
American College of Surgeons
American Society of Pediatric Neurosurgeons
American Society for Clinical Investigation
Association of American Physicians
Children’s Oncology Group
Congress of Neurological Surgeons (CNS)
Johns Hopkins Medical and Surgical Society
Joint Section on Tumors (AANS/CNS)
Pennsylvania Neurosurgical Society
Phi Beta Kappa
Society of Neurological Surgeons
Society for Neuro-Oncology
Society of Surgical Oncology

**Education & Training**

BS, Chemistry, Emory University, Magna cum Laude, 1980
MD, Johns Hopkins University School of Medicine, 1984
Residency, University of Pittsburgh, 1991
Fellowship, University of Pittsburgh, 1990
Fellowship, Hospital for Sick Children, 1991
Faculty Biographies

Ian F. Pollack, MD

Fellowship, University of Lausanne, 1991
Fellowship, University of Uppsala, 1992

Editorial Service
• Editorial Board:
  ASCO PIWC
  Child’s Nervous System
  Pediatric Blood and Cancer

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
  Director, Pediatric Neuro-Oncology Laboratory
  Co-Director, Brain Tumor Program, University of Pittsburgh Cancer Institute

• Children’s Hospital of Pittsburgh:
  Co-Director, Pediatric Neuro-Oncology Tumor Board
  Perioperative Executive Committee

Professional Activities
Pediatric Brain Tumor Consortium:
  Institutional PI
  Steering Committee
  Chair, Translational Biology Committee

NCI Brain Malignancy Steering Committee, Co-Chair
Director, American Board of Pediatric Neurological Surgery
Director, Accreditation Council for Pediatric Neurosurgery Fellowships

Honors and Awards
Castle Connolly’s America’s Top Doctors, 2002-17
Who’s Who in America (Marquis), 2005-16
Who’s Who in the World (Marquis), 2008-16
Castle Connolly’s America’s Top Cancer Doctors, 2005-17
Van Wagenen Lecturer, 2014 AANS Meeting
Winn Prize, Society of Neurological Surgeons, 2015
Columbia Softball Charity Award, 2016 AANS Meeting
Children’s Brain Tumor Foundation, Award for Scientific Excellence, 2016

Publications: 2016-17
• Refereed Articles:


Faculty Biographies

Ian F. Pollack, MD


• Book Chapters:

• Published Abstracts:


Beckner ME, Pollack IF, Hamilton RL. Transformation of ENO1 highlights the positive relationship between HIF1A’s and VEGFA’s RNA expression levels, putatively by counteracting heterogeneity in glioblastomas. *Proc American Association for Cancer Research* 3940, 2017.

• Presentations:

**Invited Lectures: 2016-17**

• National:


• Local/Regional:

• Visiting Professorships:

**Daniel R. Premkumar, PhD**

*Research Assistant Professor*

Prior to joining the faculty of the Department of Neurological Surgery at the University of Pittsburgh in 2008, Daniel R. Premkumar, PhD, was a senior scientist at a biotechnology company. He graduated from Madurai Kamaraj University in India where he earned his masters and PhD degrees. Dr. Premkumar then completed his post-doctoral training at Case Western Reserve University in Cleveland. Dr. Premkumar has published more than 40 papers in refereed journals and has been awarded patents to characterize protein-protein interaction biosensors for cellular systems biology profiling. He is currently examining the efficacy of promising various receptor inhibitors, for inhibiting glioma proliferation in vitro, using genotypically diverse panel of malignant glioma cell lines to identify potential genotype-response associations.

**Specialized Areas of Interest**

Major research emphasis is directed towards understanding the molecular mechanisms of receptor tyrosine kinase inhibition and signaling in malignant human glioma cell lines.

**Professional Organization Membership**

American Association for Cancer Research  
American Society of Pharmacology and Experimental Therapeutics
Faculty Biographies

Daniel R. Premkumar, PhD

Education & Training
BS, Biology, Madura College, 1982
MS, Animal Sciences, Madurai Kamaraj University, 1984
PhD, Entomology, Madurai Kamaraj University, 1990

Editorial Service
• Editorial Board:
  Journal of Neurology and Neurosurgery
  Journal of Neurology and Neurosciences

• Ad Hoc Reviewer:
  Journal of Cellular Physiology
  Carcinogenesis
  Molecular Carcinogenesis
  PLoS ONE

Publications: 2016-17
• Refereed Articles:

Ava Puccio, RN, PhD
Assistant Professor of Neurological Surgery
Co-Director, Neurotrauma Clinical Trials Center

Ava M. Puccio, RN, PhD is an assistant professor in the department of neurological surgery and also co-director of the Neurotrauma Clinical Trials Center in collaboration with David O. Okonkwo, MD, PhD. Dr. Puccio received her bachelor of science degree in neuroscience in 1988 and bachelor degree in nursing in 1994, both from the University of Pittsburgh. In 1995, she joined the Department of Neurological Surgery as a nurse coordinator on the National Acute Brain Injury Study: Hypothermia (NABIS:H) study and also the coordinator for the Brain Trauma Research Center. Throughout her years of employment as a nurse coordinator, she pursued part-time advanced schooling to graduate with a master’s degree in nursing from the University of Pittsburgh in 2000 and as a university scholar (top 2% of class) from the University of Pittsburgh School of Nursing with a doctoral degree, emphasis in neuroscience in 2008. Her dissertation, “Effect of short periods of normobaric hyperoxia on local brain tissue oxygenation and cerebrospinal fluid oxidative stress markers in severe traumatic brain injury” was published in the Journal of Neurotrauma in 2009. Dr. Puccio was appointed associate scientist at the Safar Center for Resuscitative Research at the University of Pittsburgh upon completion of her doctorate degree. This was a reflection of her past and continuing collaborations with Patrick Kochanek, MD, C. Edward Dixon, PhD, and Hulya Bayir, MD, as well as multiple critical care medicine fellows. Dr. Puccio was appointed assistant professor in the Department of Neurological Surgery at the University of Pittsburgh in 2010 and was granted tenure-track in 2013. Dr. Puccio received her adjunct faculty position with The School of Nursing, Department of Acute/Tertiary Care in 2010 with collaborations with Yvette Conley, PhD and Richard Henker, RN, PhD. Her research has focused on im-
proving outcomes in traumatic brain injury patients, with clinical venues of controlled normothermia, mechanisms of brain oxygenations and exploring genetic variances and expression on outcome and was awarded a K99/R00 NINR grant in 2014, entitled “Transcriptomics in Traumatic Brain Injury: Relationship to Brain Oxygenation and Outcomes.” With 21 years of clinical trial design, involvement and management, several traumatic brain and spine injury research studies have been completed and are ongoing. Many cutting-edge biomarker and high definition fiber tracking imaging and additional observational research studies are being conducted. Dr. Puccio is a member of the Neurocritical Care Society, Society of Critical Care Medicine, National Neurotrauma Society and currently serves as the secretary/treasurer for the Women in Neurotrauma Research (WiNTR).

Specialized Areas of Interest
Dr. Puccio’s specialized areas of interest are exploring secondary injury mechanisms following traumatic brain injury to improve neurological outcomes in mild, moderate and severe traumatic brain injury patients. Focused mechanisms include use of controlled normothermia and hypothermia, brain oxygenation, genetic expression and variances and clinical studies of pharmacotherapy in TBI patients.

Board Certifications
RN License: Pennsylvania

Hospital Privileges
UPMC Mercy
UPMC Presbyterian

Professional Organization Membership
Eastern Nursing Research Society
National Neurotrauma Society
Neurocritical Care Society
Sigma Theta Tau International Nursing Honor Society
Society of Critical Care Medicine
Women in Neurotrauma Research (WiNTR)

Education & Training
BS, Neuroscience, University of Pittsburgh, 1988
BSN, Nursing, University of Pittsburgh, 1994
MSN, Nursing, University of Pittsburgh, 2000
PhD, Nursing/Neuroscience, University of Pittsburgh, 2008

Editorial Service
• Ad Hoc Reviewer:
  Neurocritical Care
  Pediatric Critical Care
  Society of Critical Care Medicine
  State of the Science Congress on Nursing Research
  Therapeutic Hypothermia and Temperature Management

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Nursing Neuroscience Critical Care Course
  Annual residents’ training for 'TBI Management and Mayfield Technique'
Faculty Biographies

Ava Puccio, RN, PhD

• University of Pittsburgh:
  Mentor for one Master’s of Nursing student (Steven Benso) and two Doctoral of Nursing students (Megan Maserati and Maighdlin Anderson) and one Post-Doctoral Fellow (Consultant, F32 NRSA Training Grant; Shaun Carlson, PhD)
  Co-Director, Neurotrauma Clinical Trials Center

Professional Activities
  Secretary/Treasurer, Women in Neurotrauma in Research (WiNTR)

Honors and Awards
  Ruth Perkins Kuehn Nursing Research Award, 2011
  Cold Spring Harbor Scholarship, 2012

Publications: 2016-17
• Refereed Articles:


• Published Abstracts:


• Presentations:


Invited Lectures: 2016-17
• National:


R. Mark Richardson, MD, PhD, FAANS
Associate Professor
Director, Adult Epilepsy and Movement Disorders Surgery
Director, Brain Modulation Laboratory
Faculty Member, University of Pittsburgh Brain Institute

R. Mark Richardson, MD, PhD, FAANS, is director of Epilepsy and Movement Disorders Surgery at UPMC Presbyterian. Dr. Richardson received his undergraduate education at the University of Virginia. He completed his medical and doctoral education in the MD/PhD program at the Medical College of Virginia, where his interest in adult neurogenesis led to an NIH National Research Service Award. Prior to joining the faculty at the University of Pittsburgh in 2011, Dr. Richardson completed neurosurgical residency at the University of California San Francisco where he received specialized training in epilepsy neurosurgery, deep brain stimulation, and brain mapping during awake craniotomies. Additionally, he received an NIH National Research Service Award to study gene therapy delivery to the brain. Dr. Richardson’s clinical specialization is comprehensive epilepsy surgery and deep brain stimulation for movement disorders. At UPMC, he created one of the first interventional-MRI DBS programs in the nation, and the only such program in Pennsylvania. Similarly, he recently became one of the first neurosurgeons in the United States to use robotics in both DBS and epilepsy surgery. Dr. Richardson is principal investigator for the AADC gene therapy clinical trial for Parkinson disease (PD) at UPMC, one of only three institutions in the country currently performing gene therapy for PD. He also serves on the board of directors of the Parkinson’s Foundation of Western Pennsylvania. Dr. Richardson’s additional clinical expertise includes intraoperative mapping to preserve brain function, including language, in patients who are awake during epilepsy and tumor surgery. He also directs the Brain Modulation Lab, which anchors a multidisciplinary, human systems neuroscience research program. Dr. Richardson is an active collaborator within the Center for the Neural Basis of Cognition (a joint program between Carnegie Mellon University and the University of Pittsburgh) and the University of Pittsburgh Brain Institute.

Specialized Areas of Interest
Epilepsy surgery (including laser thermal ablation and robotic-assisted stereo-EEG), deep brain stimulation (including asleep DBS) for movement disorders and OCD, gene therapy, awake surgery in eloquent brain areas.

Board Certifications
American Board of Neurological Surgeons

Hospital Privileges
UPMC Hamot
UPMC Presbyterian
Professional Organization Membership
American Association of Neurological Surgeons
American Association of Stereotactic and Functional Neurosurgery
American Epilepsy Society
American Society for Neural Transplantation and Repair
Congress of Neurological Surgeons
International Movement Disorders Society
Society for Neuroscience

Education & Training
BA, University of Virginia, 1997
MD/PhD, Medical College of Virginia, 2005
Postdoctoral Fellowship, Bankiewicz Lab, University of California San Francisco, 2010
Residency, University of California San Francisco Neurological Surgery, 2011

Editorial Service
• Editorial Board:
  Neurosurgery

• Ad Hoc Reviewer:
  Brain Stimulation
  Epilepsy
  Epilepsy Research
  Journal of Healthcare Engineering
  Journal of Neurology Neurosurgery and Psychiatry
  Journal of Neurophysiology
  Nature Protocols
  Neurochemistry International
  Neuroscience Letters
  PLoS One
  Scientific Reports

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Epilepsy Task Force

• University of Pittsburgh:
  Institutional Review Board member

• Department of Neurological Surgery:
  Research Executive Committee

Professional Activities
Psychiatric Neurosurgery Committee, American Society for Stereotactic and Functional Neurosurgery
Scientific Planning Committee, American Society for Stereotactic and Functional Neurosurgery 2018 Biennial Meeting
Faculty, Cleveland Neural Engineering Workgroup 2017 Workshop
Faculty, World Society for Stereotactic and Functional Neurosurgery 2017 Quadrennial Meeting
Faculty Biographies

R. Mark Richardson, MD, PhD, FAANS

Community Activities
Board of Directors, Parkinson's Foundation of Western Pennsylvania

Honors and Awards
Pittsburgh's Best Doctors, Pittsburgh Magazine, 2016-17
NARSAD Young Investigator Award, Brain and Behavior Research Foundation, 2015
Faculty Teaching Award, Department of Neurological Surgery, 2013

Media Appearances: 2016-17
"Erie hospital joins Parkinson’s research project,” January 26, 2017, GoErie.com.
"Brain Surgery Option Now For Patients Crippled By Severe OCD,” August 31, 2016, CBS TV-2, New York.
"DBS Could Help Patients With Severe OCD,” July 13, 2016, KDKA-TV Evening News.

Publications: 2016-17
• Refereed Articles:

• Invited Papers:

• Book Chapters:
Invited Lectures: 2016-17

• International:

• National:

Michael J. Rutigliano, MD, MBA
Clinical Associate Professor
Director, Westmoreland County Community Neurosurgery

Michael J. Rutigliano, MD, MBA, was appointed to the University of Pittsburgh faculty in 1996. An active staff member of the University of Pittsburgh Medical Center, Dr. Rutigliano lives in Greensburg, PA, and the primary focus of his clinical practice is in Westmoreland County at the hospitals of the Excela Health System. His clinical interests include a wide range of neurosurgical diseases, focusing mostly in the areas of spinal and peripheral nerve disorders, brain tumors, and concussion and other sports-related injury. Surgical procedures performed include simple spinal surgery such as lumbar and cervical discectomy, laminectomies for spinal stenosis, and more complex spinal reconstructive surgery for spondylolisthesis and scoliosis. Common peripheral nerve surgery includes carpal tunnel release and ulnar neurolysis. Craniotomy for primary and metastatic brain tumors are also performed. He received his medical degree in 1989 from the University of Pittsburgh School of Medicine. Following an internship in general surgery, he completed residency training in neurological surgery at the University of Pittsburgh Medical Center. During this time he also obtained an MBA from the Katz Graduate School of Business. Dr. Rutigliano’s academic expertise is in medical economics and cost-effectiveness analysis. He was awarded the Pittsburgh Academy of Medicine Study Scholarship and was honored by the Stroke Council of the American Heart Association with a scholarship for research in cerebrovascular disease. Dr. Rutigliano has retired from the United States Army Reserve and has served in support of Operation Iraqi Freedom at Walter Reed Medical Center from April to July 2003, and in Balad, Iraq from October 2007 to February 2008.

Specialized Areas of Interest
Spinal disorders; peripheral nerve disorders; brain tumors.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
Latrobe Area Hospital
UPMC East
UPMC Presbyterian
Westmoreland Hospital

Professional Organization Membership
American Association of Neurological Surgeons
AANS/CNS Joint Section on Spine and Peripheral Nerve
Congress of Neurological Surgeons
Faculty Biographies

Michael J. Rutigliano, MD, MBA

Education & Training
BS, Chemistry, University of Pittsburgh, 1985
MD, University of Pittsburgh, 1989
MBA, Joseph Katz School of Business, University of Pittsburgh, 1994
Residency, Neurosurgery, University of Pittsburgh, 1996

Editorial Service
• Ad Hoc Reviewer:
  Neurosurgery

Interdepartmental and Medical Center Activities
• University of Pittsburgh Physicians:
  Neurosurgery Compensation Committee

• Latrobe Area Hospital:
  Ad Hoc Operating Room Committee

Invited Lectures: 2016-17
• Local/Regional:

Raymond F. Sekula Jr., MD, MBA
Associate Professor
Director, Cranial Nerve Disorders Program

Raymond Sekula Jr., MD, is an associate professor of neurological surgery and director of the department’s Cranial Nerve and Brainstem Disorders program. Dr. Sekula is known internationally and nationally for his development of microvascular techniques, which provide patients with improved outcomes, reduced complications, and easier recoveries. He has performed more than 1,500 procedures for patients with trigeminal neuralgia, hemifacial spasm, and other cranial neuralgias. Last year, Dr. Sekula performed more than 200 operations for patients with cranial neuralgias and 50 operations for patients with brain tumors of all types. He is an expert in minimally invasive brain and spine surgery and has developed techniques in brain surgeries of all types that reduce patients’ hospital stays to one or two days without the need for the intensive care unit after the procedure. He has been recognized with numerous honors, including The American Association of Neurological Surgeon’s Young Investigator Award, The Trigeminal Neuralgia Association Fellowship Award, a UPMC Champion of Nursing Nominee Award, and Pittsburgh Magazine’s "40 Under 40" and "Best Doctor’s" awards. Dr. Sekula received his undergraduate degree from the University of Virginia and his medical degree from Georgetown University School of Medicine. Following a surgical internship and residency in neurological surgery, he completed advanced training in minimally invasive neurosurgery and a fellowship with neurosurgical pioneer, and former University of Pittsburgh Department of Neurological Surgery chairman, Peter Jannetta, MD. Following his training, he became assistant, and then co-director, of the Cranial Nerve Disorders Center with Dr. Jannetta in Pittsburgh. Dr. Sekula is also a renowned teacher of neurological surgery and is a frequent lecturer nationally and internationally. He has been awarded the annual faculty teaching award by the department’s residents in 2015 and 2016. Dr. Sekula has authored or co-authored many original journal articles and book chapters, and is coeditor of the textbook Microvascular Decompression Surgery, a comprehensive look at MVD surgery, widely accepted as an effective remedy for cranial nerve hyperexcitability disorders including hemifacial spasm, trigeminal neuralgia, and glossopharyngeal neuralgia.
Faculty Biographies

Raymond F. Sekula Jr., MD, MBA

Specialized Areas of Interest
Minimally invasive brain and spine surgery, trigeminal neuralgia, hemifacial spasm, brain and skull base tumors.

Board Certifications
American Board of Neurological Surgery

Hospital Privileges
UPMC Presbyterian
UPMC Hamot
UPMC Mercy
UPMC Passavant

Professional Organization Membership
Allegheny County Medical Society
American Association of Neurological Surgeons
AANS/CNS Section on Pain
Congress of Neurological Surgeons
Facial Pain Association
Hemifacial Spasm Association
Medical Advisory Board of TNA
Pennsylvania Neurosurgical Society
The Facial Pain Association
Trigeminal Neuralgia Association
World Neurosurgeon Federation of Cranial Nerve Disorders

Education & Training
BA, Classics, University of Virginia, 1994
MD, Georgetown, 2000
Residency, Pediatric Neurosurgery, Children’s Hospital of Pittsburgh 2004
Residency, Neurosurgery, Allegheny General Hospital, 2006
Fellowship, Microvascular & Skull Base Surgery, 2006
MBA, Carnegie Mellon University, 2009

Editorial Service
• Ad Hoc Reviewer:
  Journal of Neurosurgery
  Journal of Neurology, Neurosurgery, and Psychiatry
  Neurosurgery Journal
  World Neurosurgery Journal

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
  Physician Champion, Neurosurgery Care Coordination
  Organizing Committee, Inaugural Peter J. Jannetta Scientific Symposium
  Clinical Competency Committee

• Department of Neurological Surgery:
  Executive Resident Selection Committee
  Craniotomy Supply Chain Analytics Team Member, Neurosurgery Service Line
Faculty Biographies

Raymond F. Sekula Jr., MD, MBA

• University of Pittsburgh:
  Health Career Scholars Academy: Shadow Day
  Career Night

Professional Activities
Portal Editorial Board (Pain Section), ANS, AANS, CNS

Community Activities
Children’s Museum of Pittsburgh Gala Committee

Honors and Awards
Pittsburgh Magazine “Best Doctors” Award, 2016-2017
Department of Neurological Surgery Faculty Teaching Award, 2016
Allen L. Humphrey Excellence in Mentoring, University of Pittsburgh School of Medicine, 2016
UPMC Champion of Nursing Nomination

Media Appearances: 2016-17
“Woman finds hope in struggle with ‘suicide disease,’” WUSA-9, Washington, D.C., October 7, 2016,

Publications: 2016-17
• Refereed Articles:


• Invited Papers:


• Book Chapters:

• Published Abstracts:
Invited Lectures: 2016-17

• International:


• National:

• Local/Regional:


Nilkantha Sen, PhD
Associate Professor

Nilkantha Sen, PhD, joined the University of Pittsburgh Department of Neurological Surgery in March of 2017 as an associate professor. After graduating from Indian Institute of Chemical Biology—one of the most prestigious institutes of India—Dr. Sen joined Johns Hopkins University in 2010 as a post-doctoral fellow under the mentorship of Solomon H Snyder, MD. His work studied the mechanism involved for nitric oxide-induced neuronal cell death and he discovered a novel mechanism which was shown to play a key role in cell death associated with several neurodegenerative diseases such as Alzheimer’s Disease, Parkinson’s Disease and brain injury. Dr. Sen also identified a novel neuroprotective protein, GOSPEL, which can protect cell death in the brain during neurodegeneration. Furthermore, his findings further clarified the molecular mechanism associated with both hyperactivity and neurotoxicity following exposure of cocaine, providing a new insight in the field of drug abuse. While working in the field of nitric oxide, Dr. Sen also explored another newly discovered gasotransmitter, hydrogen sulfide (H2S) in the brain and in peripheral tissues such as the liver. However, its role in physiology and pathology was poorly understood. Dr. Sen found that, like nitric oxide, H2S also modifies proteins through a process of sulfhydration and shows that sulfhydration of several proteins affects their biological functions and influences the outcome of neurodegenerative diseases. In 2012, Dr. Sen joined Georgia Regents University as an assistant professor and started working in the field of traumatic brain injury. His major interest in TBI is to understand the role of gasotransmitter in the pathology. Recently, he has identified a novel mechanism that can explain the edema and cell death following TBI. Dr. Sen has published 38 papers in refereed journals including seven review articles. Total citations have exceeded 2500.
Nilkantha Sen, PhD

**Specialized Areas of Interest**
Elucidating molecular mechanisms associated with pathology of TBI; cognitive dysfunction, memory impairment and vision impairment following TBI; pre-clinical testing of potential compounds against TBI in mice model.

**Professional Organization Membership**
Indian Science Congress Association
Society of Biological Chemistry, India
Society for Neuroscience, USA

**Education & Training**
BSc, Chemistry, Calcutta University, India 1998
MSc, Biochemistry, Calcutta University, India, 2000
PhD, Oxidative Stress, Cell Death, Indian Institute of Chemical Biology, 2006
Post-Doc Fellowship, Neuroscience, Johns Hopkins Medical College, 2010

**Editorial Service**
- **Editorial Board:**
  - American Journal of Neuroscience Research
  - International Journal of Neurology Research
  - Journal of Neurology and Neurosurgery
  - Neurology and Neurotechnolog

- **Ad Hoc Reviewer:**
  - Aging Research Reviews
  - Frontiers in Endocrinology
  - Journal of Biological Chemistry
  - Journal of Neuroscience
  - Journal of Translational Medicine
  - Molecular Cell
  - Molecular Neurobiology
  - Neurochemistry International
  - Neuromolecular Medicine
  - Oncotarget
  - Pharmacological Research
  - PLoS ONE
  - Proceedings of the National Academy of Sciences
  - Science Signaling

**Honors and Awards**
Emerging Scientist Award, Augusta University, Ga., 2016
Young Outstanding Basic Science Faculty Award, Georgia Regents University, 2016
Oral Podium Award, 2nd International Conference on H2S Biology and Medicine, 2012
Young Scientist Award (W. Barry Wood, Jr), Johns Hopkins University, 2010
Third Prize, Annual Poster Competition, Johns Hopkins University, 2009
Best Poster Award, International Symposium on Molecular Mechanism of Diseases, 2005

**Publications: 2016-17**
- **Refereed Articles:**


**Tanusree Sen, PhD**

*Research Assistant Professor*

Tanusree Sen, PhD, joined the University of Pittsburgh Department of Neurological Surgery in March of 2017 as a research assistant professor. As part of her PhD training, she developed expertise in the area of oxidative stress-mediated cellular dysfunctions and brain aging. In 2007 after her graduation, she joined the research group of David Sidransky, MD, at Johns Hopkins University’s Division of Head and Neck Cancer. In Dr. Sidransky lab, Dr. Sen worked on multiple projects unraveling the molecular pathways and mechanism involving in different cancer including cigarette smoking-induced bladder cancer. Her work studied the mechanism involved p53 isoform, p63 for cell death and chemoresistance and she discovered novel mechanisms which were shown to play a key role in cell death associated with several different cancer. In a separate project of age-related macular degeneration, she discovered the key role of lens structural protein CRYBA1 in anoikis and autophagy process in mouse retinal astrocytes and retinal pigmented epithelial cells. In 2012, Dr. Sen joined Augusta University as a postdoctoral fellow and extended her expertise of cellular-molecular biology in the field of immunology, autoimmunity and traumatic brain injury and discovered molecular mechanism regulating neuronal death and memory function after traumatic brain injury. In 2015, Dr. Sen started working as a research assistant professor at the University of Georgia and worked on the mechanism of diet-induced vagal nerve injury specifically in the context of the gut-microbiota-inflammation-brain axis. At this time she discovered how different diet may contribute to gut microbial dysbiosis, inflammation and subsequently damage to the vagal nerve. Dr. Sen has published 33 papers in refereed journals with total citations have exceeded 2500.

**Specialized Areas of Interest**

Studying the influence of oncogenic transcription factors on the TBI-pathology; regulation of immune response and its influence on cognitive dysfunction following TBI; studying the role of resident microbial cells on TBI-pathology.

**Professional Organization Membership**

*Society for Neuroscience*

**Education & Training**

BSc, Chemistry, Calcutta University, India 1998
MSc, Biochemistry, Calcutta University, India, 2000
PhD, Aging, Mitochondrial function, membrane potential, University of Calcutta, 2006
Post-Doc Fellowship, oncogenic activation, cell death and proliferation, Johns Hopkins Medical College, 2010
Editorial Service

- Ad Hoc Reviewer:
  - Brain Sciences
  - Cell Cycle
  - Eye and Brain
  - Hypoxia
  - ImmunoTargets and Therapy
  - Infection and Drug Resistance
  - Journal of Biological Chemistry
  - Neurobiology of Diseases
  - OncoTargets and Therapy
  - PloS One

Honors and Awards

Awarded Junior Research Fellowship in the Life-Sciences category, University Grants Commission (UGC), India, 2000
Awarded Lectureship and Research Fellowship by the Council for Scientific and Industrial Research, India, 2001
Awarded Senior Research Fellowship by the Council for Scientific and Industrial Research, India, 2003
Best Oral Presentation Award, International Symposium on Free Radical Research, India, 2006
Finalist in Young Scientist Award Lecture, Society for Free Radical Research, India, 2006

Publications: 2016-17

- Refereed Articles:


Mingui Sun, PhD
Professor

Mingui Sun, PhD, received a BS degree in instrumental and industrial automation in 1982 from the Shenyang Chemical Engineering Institute in Shenyang, China, and an MS degree in electrical engineering in 1986 from the University of Pittsburgh, where he also earned a PhD degree in electrical engineering in 1989. He was later appointed to the faculty in the Department of Neurological Surgery. Dr. Sun’s research interests include neurophysiological signals and systems, biosensor designs, brain-computer interface, bioelectronics and bioinformatics. He has more than 400 publications.

Specialized Areas of Interest
Biomedical engineering; biomedical instrumentation; biomedical signal processing, computational neurophysiology, image and video processing; computer-assisted neurosurgery and diagnosis.

Professional Organization Membership
American Institute for Medical and Biological Engineering
Institute of Electrical and Electronics Engineers
IEEE Engineering in Medicine and Biology Society
IEEE Circuit and Systems Society

Education & Training
BS, Instrumentation/Industrial Automation, Shenyang Chemical Institute, 1982
MS, Electrical Engineering, University of Pittsburgh, 1986
PhD, Electrical Engineering, University of Pittsburgh, 1989

Editorial Service
• Editorial Board:
  * International Journal of Information and Communication Engineering
  * International Journal of Medical Implants and Devices
  * Journal of Healthcare Engineering

• Ad Hoc Reviewer:
  * National Institutes of Health
  * National Science Foundation
  * University Grants Committee (Hong Kong)

Professional Activities
Fellow, American Institute of Biological and Medical Engineers (AIBME)
Technical Committee Member, Biomedical and Life Science Systems, Circuit and Systems Society, IEEE

Honors and Awards

Publications: 2016-17
• Refereed Articles:


**Book Chapters:**


**Presentations:**


Xin M, Zhang H, Sun M, Yuan D. Recurrent Temporal Sparse Autoencoder for attention-based action recognition.” International Joint Conference on Neural Networks (IJCNN), Vancouver, Canada, July 24-29, 2016.

**Invited Lectures: 2016-17**

- **International:**
  
  Sun M. “Integration of Electronics and Textiles for Next-Generation Wearable Devices.” Department of Biomedical Engineering, Hebei University of Technology, Tianjin, China, December 22, 2016.

- **National:**
  
Faculty Biographies

Mingui Sun, PhD

- Local/Regional:

- Visiting Professorships:
  Department of Biomedical Engineering, Hebei University of Technology, Tianjin, China, "Developing Wearable Electronics and Textiles for Next Generation Wearable Devices." December 22-25, 2016.
  Sleep Medicine Research Center, National Cheng-Kung University Hospital, Tainan, Taiwan, "Bioengineering Approach to Sleep Medicine." February 23-24, 2017.

Mandep Tamber, MD, PhD

Mandeep S. Tamber, MD, PhD, joined the faculty of the University of Pittsburgh Department of Neurological Surgery in the pediatric neurosurgery division at Children's Hospital of Pittsburgh on August 1, 2009. Dr. Tamber began his medical studies at the University of Alberta, Canada, where he earned a doctor of medicine degree with distinction and honors in research. After graduating from medical school in June 1999, he completed his neurosurgical residency at the University of Toronto. During residency, Dr. Tamber worked towards obtaining a PhD degree in clinical epidemiology and biostatistics from McMaster University. He completed a postgraduate fellowship in pediatric neurological surgery at the Hospital for Sick Children, Toronto and is board certified by the Royal College of Physicians and Surgeons of Canada and the American Board of Pediatric Neurological Surgery. Dr. Tamber is surgical director of the Pediatric Epilepsy Program at Children's Hospital of Pittsburgh. In addition to the surgical management of pediatric epilepsy, Dr. Tamber's practice also focuses on general pediatric neurosurgery, including the management of complex hydrocephalus, craniofacial disorders, pediatric neuro-oncology, spinal dysraphism, and pediatric neuro-trauma.

Specialized Areas of Interest
Epilepsy surgery; craniofacial surgery; endoscopic management of hydrocephalus.

Board Certifications
American Board of Pediatric Neurological Surgery
Royal College of Physicians and Surgeons of Canada

Hospital Privileges
Children's Hospital of Pittsburgh of UPMC
Magee-Womens Hospital of UPMC
UPMC Presbyterian
Mandeep Tamber, MD, PhD

Faculty Biographies

**Professional Organization Membership**
American Association of Neurological Surgeons (AANS)
AANS/CNS Joint Guidelines Committee
American Society of Pediatric Neurosurgeons
CNS/AANS Joint Section of Pediatric Neurosurgery
CNS/AANS Joint Section on Tumors
Congress of Neurological Surgeons (CNS)
Medical Advisory Board of the Hydrocephalus Association
Royal College of Physicians and Surgeons of Canada

**Education & Training**
BSc, Medical Sciences, University of Alberta, 1995
MD, University of Alberta, 1999
PhD, Clinical Epidemiology and Biostatistics, McMaster University, 2010
Residency, Neurosurgery, University of Toronto, 2008
Fellowship, Hospital for Sick Children, Toronto, 2009

**Editorial Service**
- Ad Hoc Reviewer:
  * Child’s Nervous System
  * Canadian Journal of Neurological Sciences

**Interdepartmental and Medical Center Activities**
- University of Pittsburgh:
  Chair, Institutional Data and Safety Monitoring Board (DSMB)
  Brain-Computer Interface Study
- Children’s Hospital of Pittsburgh of UPMC:
  Medical Advisory Committee—Pediatric Trauma
  Surgical Epilepsy Program
  Pediatric Neuro-oncology Board

**Publications: 2016-17**
- Refereed Articles:


Parthasarathy D. Thirumala, MD

Associate Professor
Director, Center of Clinical Neurophysiology

Parthasarathy D. Thirumala, MD, joined the Center of Clinical Neurophysiology in June 2008. Dr. Thirumala specializes in intraoperative neurophysiological monitoring to adult and pediatric neurosurgical, orthopedic, ENT, vascular and interventional neuroradiology procedures. Dr. Thirumala completed his neurology residency and clinical neurophysiology fellowship training at the University of Pittsburgh Medical Center. He completed his internship in internal medicine training at Brookdale University Hospital and Medical Center in Brooklyn, N.Y. Prior to clinical training he completed his masters in biomedical engineering at the University of Illinois at Chicago. Dr. Thirumala completed his medical training in India at Stanley Medical College in Chennai, India. Prior to joining the department, Dr. Thirumala was in private practice providing intraoperative neurophysiological monitoring services. His group was one of the largest physician groups in the country providing intraoperative neurophysiological to approximately 90 hospitals across 12 states in the United States. His clinical and research interests include intraoperative neurophysiological monitoring during expanded endonasal approach, functional cortical mapping during awake craniotomies, ICU EEG. He has published over 60 peer reviewed articles, book chapters, and invited articles in the journals including JAMA Neurology, Neurology, Neurosurgery, Journal of Neurosurgery, and Journal of Clinical Neurophysiology. He has given lectures both nationally and internationally on the value of intraoperative neurophysiological monitoring.

Specialized Areas of Interest
Intraoperative neurophysiological monitoring; functional cortical mapping during awake craniotomies; neurophysiological monitoring during minimally invasive endonasal approach to skull base surgeries, electroencephalography in the intensive care unit and telemedicine.

Board Certifications
American Board of Clinical Neurophysiology: Intraoperative Monitoring
American Board of Neuroimaging
American Board of Neurophysiologic Monitoring
American Board of Psychiatry and Neurology: Subspecialty Clinical Neurophysiology
American Board of Psychiatry and Neurology

Hospital Privileges
Children’s Hospital of Pittsburgh of UPMC
Jameson Hospital
Magee-Womens Hospital of UPMC
Monongahela Valley Hospital
UPMC Braddock
UPMC Hamot
UPMC Horizon-Greenville
UPMC Mercy
UPMC Passavant
UPMC Presbyterian
UPMC St. Margaret
UPMC Shadyside
Parthasarathy D. Thirumala, MD

Professional Organization Membership
American Academy of Neurology
American Clinical Neurophysiology Society
American Medical Association
American Society of Electroneurodiagnostic Technologists
American Society of Neurophysiological Monitoring
American Telemedicine Association

Education & Training
MBBS, Stanley Medical College, 1997
MS, University of Illinois, Bioengineering, 2001
Residency, Neurology, University of Pittsburgh, 2006
Fellowship, Clinical Neurophysiology, University of Pittsburgh, 2007

Editorial Service
• Ad Hoc Reviewer:
American Journal of Electroneurodiagnostic Technology
Frontiers in Neuroscience
Journal of the American Medical Association
Journal of Clinical Monitoring and Computing
Neurological Research
Neurology
Stroke

Interdepartmental and Medical Center Activities
• UPMC Presbyterian:
Telemedicine Oversight Committee, Center For Connected Medicine
Regional Ambassador, UPMC Global Care

Professional Activities
American Academy of Neurology, Government Relations committee.
American Clinical Neurophysiology Society, Social Media and Website committee

Publications: 2016-17
• Refereed Articles:


**Presentations:**


Invited Lectures: 2016-17
- International:
  Thirumala PD. “Motor mapping: Penfield to present.” Narayana Hridayala Hospital, Bangalore, India, August 1, 2016.

- National:

- Visiting Professorships:
  Narayana Hridayala Hospital, Bangalore, India: “Evoked potentials monitoring.” August 1, 2016.

Elizabeth C. Tyler-Kabara, MD, PhD

Associate Professor

Elizabeth C. Tyler-Kabara, MD, PhD completed her bachelor’s degree at Duke University, double majoring in biomedical and electrical engineering, in 1989. After leaving Duke, she worked at the National Institutes of Health as a biomedical engineer, developing and testing molecular biology software, developing a strategic plan for implementing computer networking, and recruiting a head for the newly formed Computational Biology Group. She left the NIH to attend Vanderbilt University, earning her MD and PhD in 1997. Her graduate
research in the Department of Molecular Physiology and Biophysics investigated the neurophysiology of the corticostriatal synapse. This served as the basis for her interest in neuro-modulation, which has been a key aspect of her subsequent clinical research activities. She completed her internship in general surgery at the University of Pittsburgh in 1998 under the direction of Richard Simmons, MD. Following internship she specialized in neurological surgery during her residency at UPMC and VA hospitals from 1998-2004 under L. Dade Lunsford, MD. She then completed a fellowship in pediatric neurosurgery at the Children’s Hospital of Alabama in 2005 under the direction of W. Jerry Oakes, MD. Dr. Tyler-Kabara served as assistant professor in the Department of Neurological Surgery, University of Pittsburgh, from 2005-2014 and now as associate professor. She has secondary appointments in the Department of Bioengineering, Swanson School of Engineering, since 2006 and in the Department of Physical Medicine and Rehabilitation since 2007. Dr. Tyler-Kabara has been a faculty member of the McGowan Institute for Regenerative Medicine since 2000. She has been a member of the medical staff of Children’s Hospital of Pittsburgh of UPMC, UPMC Shadyside and UPMC Presbyterian since 2005 and a medical consultant at Magee Women’s Hospital of UPMC since 2007. Dr. Tyler-Kabara directs the Neural Enhancement Laboratory in the Department of Neurological Surgery. The focus of the laboratory is improving function following injury to the central nervous system. Dr. Tyler-Kabara’s research has been supported by the National Institutes of Health, NINDS and NICHD, DARPA, Craig Nielsen and Margot Anderson Foundations, The Copeland Fund and Pedal with Pete. She served as principal investigator for five of those grants. She was the co-principal investigator on the grant that kick-started the brain computer interface human trials at the University of Pittsburgh. She has served as a co-investigator on six grants including the current brain computer interface grants. Current efforts are focused on the use of brain computer interfaces to restore function. The current studies employ electrocorticography and microelectrode techniques in conjunction with brain computer interfaces for control of neural prosthetics. These studies are conducted in collaboration with the Human Rehabilitation Neural Engineering Laboratory in the Department of Physical Medicine and Rehabilitation combining expertise in engineering, neuroscience, and rehabilitation medicine. Her work was featured on CBS-TV’s 60 Minutes. Additionally, Dr. Tyler-Kabara has been the director of the Spasticity and Movement Disorder Program at Children’s Hospital of Pittsburgh since 2006. This program is one of the few multidiscipline movement disorder programs combining the expertise of neurological surgery, orthopedics, physiatry, occupational and physical therapy and social work. This program is one of the world’s largest pediatric intrathecal baclofen pump experiences with over 500 pump implants. Dr. Tyler-Kabara was the director of the Surgical Epilepsy Program at the University of Pittsburgh. She provide the support to build both the pediatric and adult epilepsy programs including recruiting new faculty members for each program. She served on the Epilepsy Task Force created in 2012. She has served on the executive committee for the McGowan Institute for Regenerative Medicine since 2008. She is currently a member of the Medical Executive Committee at Children’s Hospital of Pittsburgh. In her clinical work she has pioneered the use of expanded endonasal surgery of the skull base in extremely young children providing them with a minimally invasive alternative for the treatment of a variety of conditions. Dr. Tyler-Kabara has over 75 publications in peer-reviewed journals. She has over 15 book chapters and 70 published abstracts. She supervises pediatrics, neurology, and physical medicine residents and fellows on the neurological surgery service and in the Spasticity and Movement Disorder clinic. Dr. Tyler-Kabara won the Department of Neurological Surgery teaching award in 2009 and is actively engaged in teaching medical students, graduate students, and post-doctoral fellows in laboratory. She has taught numerous medical school courses including the first year Introduction to Being a Physician. She has been the ILS course director for the Neurosurgery and Head and Neck Dissection since 2007. Dr. Tyler-Kabara has given 20 local lectures, 20 regional lectures, five national invited lectures and seven international invited lectures.
Elizabeth C. Tyler-Kabara, MD, PhD

**Specialized Areas of Interest**
Cerebral palsy; spasticity; dystonia; movement disorders; epilepsy; pediatric spinal and skull base disorders.

**Board Certifications**
- American Board of Neurological Surgery
- American Board of Pediatric Neurosurgery

**Hospital Privileges**
- Children’s Hospital of Pittsburgh of UPMC
- Magee-Womens Hospital of UPMC
- UPMC Presbyterian
- UPMC Shadyside

**Professional Organization Membership**
- Allegheny County Medical Society
- American Association of Neurological Surgeons (AANS)
- American Association for the Advancement of Science
- American Medical Association
- American Medical Student Association
- American Medical Women’s Association
- American Society of Pediatric Neurosurgery
- American Society of Stereotactic and Functional Neurosurgery
- Congress of Neurological Surgeons (CNS)
- Engineering in Medicine and Biology Society
- Institute of Electrical and Electronics Engineers (IEEE)
- Joint Section on Neurotrauma and Critical Care (AANS/CNS)
- Joint Section on Pediatric Neurological Surgery
- Joint Section on Tumors (AANS/CNS)
- North American Skull Base Society
- North American Spine Society
- Pennsylvania Medical Society
- Sigma Xi
- Society for Neuroscience
- Women in Engineering
- Women in Neurosurgery

**Education & Training**
- BSE, Biomedical and Electrical Engineering, Duke University, 1989
- MD, Vanderbilt University, 1997
- PhD, Molecular Physiology and Biophysics, Vanderbilt University, 1997
- Residency, Neurosurgery, University of Pittsburgh, 2004
- Fellowship, Pediatric Neurosurgery, University of Alabama, 2005

**Editorial Service**
- Ad Hoc Reviewer:
  - *Children’s Nervous System*
  - *Journal of Neurological Surgery*
  - *Pediatric Neurosurgery*
  - *Paediatric & Child Health*
Elizabeth C. Tyler-Kabara, MD, PhD

Media Appearances: 2016-17


“In a first, brain computer interface helps paralyzed man feel again,” October 13, 2016, Science Daily.


Interdepartmental and Medical Center Activities

• UPMC Presbyterian:
  Epilepsy Task Force

• University of Pittsburgh:
  Executive Committee, McGowan Institute for Regenerative Medicine
  Admission Committee, School of Medicine

• Children’s Hospital of Pittsburgh:
  Medical Executive Committee
  Surgical Site Infection Committee

Publications: 2016-17

• Refereed Articles:


• Book Chapters:


**Daniel A. Wecht, MD, MSc**
Clinical Professor  
Chief, Neurosurgery, UPMC McKeesport  
Chief, Neurosurgery, UPMC St. Margaret  
Chief, Neurosurgery, UPMC Shadyside

Daniel A. Wecht, MD, joined the Department of Neurological Surgery as a clinical assistant professor in September of 1999. He was promoted to clinical associate professor in 2002 and full clinical professor in 2008. He was born and raised in Pittsburgh. After graduating from Harvard University, Dr. Wecht attended medical school at the University of Pennsylvania. He completed his neurosurgery residency at Baylor College and then completed a two-year neurovascular surgery fellowship at Yale University School of Medicine. He was board-certified with the American Board of Neurological Surgery in 2000 and was recertified in 2010. Dr. Wecht specializes in the treatment of brain tumors and cerebrovascular diseases such as stroke, aneurysms and vascular malformations. He also has an active spine and general neurosurgery practice. He has co-authored or authored several articles and publications. Dr. Wecht has been a neurosurgical faculty member at Yale University, University of New Mexico and Allegheny University of the Health Sciences (Pittsburgh, Pa.). He is an active participant in multiple professional and scientific societies. He is licensed to practice in Pennsylvania and New Mexico.

**Specialized Areas of Interest**
Vascular neurosurgery (aneurysms and vascular malformations); brain tumors; spinal and peripheral nerve microsurgery; trigeminal neuralgia, chiari malformation and hydrocephalus.

**Board Certifications**
American Board of Neurological Surgery

**Hospital Privileges**
UPMC Presbyterian  
UPMC Shadyside  
UPMC McKeesport  
UPMC St. Margaret

**Professional Organization Membership**
AANS/CNS Joint Section on Cerebrovascular Surgery  
AANS/CNS Joint Section on Trauma
**Faculty Biographies**

Daniel A. Wecht, MD, MSc

Allegeny County Medical Society
American Association of Neurological Surgeons
American College of Surgery Associate Fellow
American Medical Association
American Heart Association-Stroke Council
Congress of Neurological Surgeons
Pennsylvania Medical Society

**Education & Training**
AB, Anthropology, Harvard University, 1985
MS, Anthropology, University of Pennsylvania, 1989
MD, University of Pennsylvania, 1989
Residency, Baylor College of Medicine, 1995
Fellowship, Neurovascular, Yale University, 1997

**Professional Activities**
Team Neurosurgeon, The Pittsburgh Penguins Hockey Club

**Publications: 2016-17**

Monte S. Weinberger, MD
*Clinical Assistant Professor*

Monte S. Weinberger, MD, joined the faculty of the University of Pittsburgh Department of Neurological Surgery in May of 2014. He graduated from the Medical University of South Carolina College of Medicine in 1987.

**Specialized Areas of Interest**
Spinal cord stimulators; degenerative spinal disorders; brain tumors.

**Hospital Privileges**
UPMC East
UPMC Shadyside

**Professional Organization Membership**
Allegeny County Medical Society
American Medical Association
Congress of Neurological Surgeons

**Education & Training**
BS, Chemistry, College of William & Mary, 1977
MMSc, Anesthesia/CCM, Emory University, 1983
MD, Medical University of South Carolina, 1987
**Faculty Biographies**

**Hong Qu Yan, MD, PhD**

*Research Assistant Professor*

Hong Qu Yan, MD, a licensed acupuncturist in Pennsylvania and New York, received his medical degree in 1982 from Shanghai College of Traditional Chinese Medicine, China and completed his residency program at the Shanghai First Pulmonary Hospital, in China. He then pursued his master's and PhD degree in medical and pharmaceutical research at Free University of Brussels (VUB), Belgium. In 1992, he became a postdoctoral fellow in the University of Texas Health Science Center at Houston. In 1996, he joined the Department of Neurological Surgery at the University of Pittsburgh as a postdoctoral fellow. Dr. Yan retired from the department in April of 2017.

**Fang-Cheng (Frank) Yeh, MD, PhD**

*Assistant Professor*

*Technical Director, High Definition Fiber Tracking Laboratory*

Fang-Cheng (Frank) Yeh, MD, PhD, joined the Department of Neurological Surgery at the University of Pittsburgh in July of 2016 as an assistant professor. Prior to joining the University of Pittsburgh, Dr. Yeh received his MD degree from National Taiwan University and completed his PhD study in biomedical engineering at Carnegie Mellon University in 2014. Dr. Yeh is currently working on diffusion MRI and its role as image biomarkers for neuropsychiatric disorders. His research focused on novel applications of computational methods to brain connectome research, a challenging field with a lot of known unknowns and unsolved questions that require extensive technological development. He has developed several diffusion MRI methods and applied them to both clinical and translational studies. Dr. Yeh developed High Definition Fiber Tracking (HDFT), an in-vivo diffusion MRI fiber tracking method powered by Dr. Yeh’s work on generalized q-sampling imaging and its derived tracking method. In 2015, the International Society for Magnetic Resonance in Medicine (ISMRM) held an open competition to examine the performance of different diffusion MRI fiber tracking pipelines. Dr. Yeh’s method achieved the highest valid connection score (92.49%, ID:03) among 96 different approaches submitted by a total of 20 groups all over the world. Dr. Yeh is known for his development of DSI Studio, an integrated platform for diffusion MRI analysis, fiber tracking, and 3D tractography visualization. Since its debut in 2008, DSI Studio has been downloaded more than 20,000 times. In 2016 alone, DSI Studio has facilitated more than 70 peer-reviewed publications. These journal papers are published in top-tier journals. DSI Studio provides the core technique for High Definition Fiber Tracking (HDFT), which has been widely used by many research groups to investigate how major fiber pathways are affected by neurological and psychiatric diseases. Dr. Yeh also developed WS-Recognizer, an open-source quantitative pathology tool that analyzes whole slide images and automatically recognizes targets. WS-Recognizer has been used to correlate pathology finding with MRI and visualize tissue characteristics in a panoramic view across the entire tissue section.

**Specialized Areas of Interest**

Diffusion MRI, tractography, network analysis, medical image analysis, pathology informatics.

**Professional Organization Membership**

International Society for Magnetic Resonance in Medicine

**Education & Training**

MD, National Taiwan University, 2006
PhD, Biomedical Engineering, Carnegie Mellon University, 2014
Fang-Cheng (Frank) Yeh, MD, PhD

Faculty Biographies

Editorial Service

• Editorial Board:
  Proceedings of the National Academy of Sciences (PNAS), guest editor

• Ad Hoc Reviewer:
  Computer Methods and Programs in Biomedicine
  Frontier in Neuroscience
  Journal of Magnetic Resonance Imaging
  Journal of Neuroscience
  Medical Physics
  Neuroimage
  Neurological Sciences
  Neurosurgery
  PLOS One

Media Appearances: 2016-17

“Your brain ‘fingerprint’ is unique enough to ID you,” futurity.org, November 16, 2016.
“Researchers develop way to ‘fingerprint’ the brain,” medicalexpress.com, November 15, 2016.

Publications: 2016-17

• Refereed Articles:

Invited Lectures: 2016-17

• National:
  Yeh FC. “Diffusion MRI as a potential imaging biomarker for probing the influence of brain diseases.” Center for Integrated Neuroscience and Human Behavior, University of Utah, January 12, 2017.
Fang-Cheng (Frank) Yeh, MD, PhD

**Local/Regional:**
Yeh FC. “Local Connectome Fingerprint: a potential imaging biomarker for probing the influence of brain diseases.” Computational Pathology Interest Group and Lecture Series, University of Pittsburgh, October 11, 2016.

---

**David S. Zorub, MS, MD**

*Clinical Professor*

*Director, Neuro Intensive Care, UPMC Shadyside*

David S. Zorub, MS, MD, joined the faculty of the University of Pittsburgh Department of Neurological Surgery in May of 2014. Dr. Zorub was born in Lebanon and immigrated to the United States at the age of nine. He grew up in Hot Springs, Ark., where he received his primary education. Dr. Zorub received his undergraduate degree from Tulane University College of Arts and Sciences, graduating summa cum laude with a major in history. His subsequent education was at Tulane University School of Medicine where he received his medical degree cum laude and a masters of science in neuroanatomy. Post-graduate education was at Duke University Medical Center where he completed his internship and residency in neurologic surgery. While at Duke he did a special postdoctoral fellowship for the Veteran’s Administration and did research at the Institute of Physiology in Pisa, Italy. Upon completion of training at Duke University Medical Center, Dr. Zorub came to the University of Pittsburgh and Presbyterian University Hospital where he served as director of residency education and director of stereotactic surgery. He subsequently relocated to Shadyside Hospital and Foundation in 1979 and has served as director of neurosurgery, and subsequently as chief of neurosurgery from January 1979 to September 2014. Dr. Zorub served as chief of surgery at Shadyside Hospital from July 1993 to August 31, 2009. Dr. Zorub also functioned as vice president of clinical affairs for Shadyside Hospital for seven years and his responsibilities included the clinical oversight of the merger agreement with UPMC Presbyterian for the Shadyside Board of Trustees as well as serving as vice president overseeing medical staff services, infection control, informatics and process improvement and quality management. He has also been active in organized medicine, having served as president of the Allegheny County Medical Society, chair of its board of trustees, and chair of the ACMS Foundation Board of Trustees. Dr. Zorub continues to be very active clinically and is currently director of neuro intensive care at UPMC Shadyside. He has served in numerous positions at the hospital, participating in essentially all facets of the institution. His areas of expertise include brain tumors, pituitary microsurgery, cranial nerve disorders like trigeminal neuralgia, hemifacial spasm, treatment for benign and malignant disease and spine surgery. He also specializes in peripheral nerve disorders having trained under Barnes Woodhall, MD.

**Specialized Areas of Interest**

- Brain tumors
- Pituitary microsurgery
- Cranial nerve disorders
- Hemifacial spasm
- Spine surgery
- Peripheral nerve surgery
- Pain management

**Board Certifications**

American Board of Neurological Surgery

**Hospital Privileges**

- UPMC Cancer Center
- UPMC East
- UPMC Presbyterian
- UPMC Shadyside
David S. Zorub, MS, MD

**Professional Organization Membership**
American Association of Neurological Surgeons
American Association for Stereotactic Surgery
American Medical Association
Congress of Neurological Surgeons
Pennsylvania Medical Society
Pennsylvania Neurosurgical Society

**Education & Training**
MS, Anatomy, Tulane University, 1970
MD, Tulane University, 1970
Residency, Duke University, 1970-76
Fellowship, University of Pisa, 1974
Fellowship, Duke University, 1974
Resident Biographies
Resident Biographies

Nitin Agarwal, MD
PGY-3 Resident

Nitin Agarwal, MD, joined the University of Pittsburgh Department of Neurological Surgery residency program in July of 2014. Prior to matriculating into the residency program, Dr. Agarwal received his doctorate of medicine from Rutgers New Jersey Medical School. His funded research activities focus on improving patient education to optimize patient outcomes. To date, he has published over 125 peer-reviewed articles, 10 book chapters as well as spoken at several regional and national conferences, with over 100 oral and poster presentations. Dr. Agarwal’s health literacy related research has been published in several high impact factor journals including *JAMA Internal Medicine* and featured by prominent healthcare oriented news outlets such as *Reuters Health*. He is also the co-editor of the book *The Evolution of Health Literacy: Empowering Patients through Improved Education*. Dr. Agarwal also maintains an active role in organized neurosurgery advocating for medical student and patient education. His article entitled “Improving Medical Student Recruitment into Neurological Surgery” was featured online by the American Association of Neurological Surgeons. He was appointed as a member of the Young Neurosurgeons Committee of the American Association of Neurological Surgeons and serves as the Medical Student Task Force resource coordinator and Top Gun Competition chair. Dr. Agarwal was also selected as a Council of State Neurological Societies socioeconomic fellow and continues to serve as a past resident fellow mentor. In addition, he is an advocate for philanthropic support and has been placed on the board of directors of both the Neurosurgery PAC as a young neurosurgery member and the Neurosurgery Research and Education Foundation as a resident liaison. Outside of neurological surgery, Dr. Agarwal is deeply dedicated to martial arts, specifically the disciplines of taekwondo, Krav Maga, and Jiu-Jitsu.

Specialized Areas of Interest
Scoliosis and complex spinal deformity; minimally invasive spine surgery; spinal biomechanics; patient education and outcomes research; socioeconomic policy in organized neurosurgery.

Professional Organization Membership
American Association of Neurological Surgeons
American Medical Association
Congress of Neurological Surgeons
Council of State Neurological Societies

Education & Training
MD, Rutgers, The State University of New Jersey, 2014
BS, Biology, The College of New Jersey, 2010

Honors and Awards
First Place, Socioeconomic E-poster Award, AANS Annual Scientific Meeting, 2017
Socioeconomic Fellow, Council of State Neurological Societies, 2017
The Beckwith Institute Grant, 2016
Walter L. Copeland Grant, 2016
Charlie Kuntz IV Scholar Award, Spine Summit Outstanding Abstract, 2016
Peter W. Carmel, MD, Award in Neurological Surgery, 2014
Kenneth G. Swan, MD, Memorial Award, NJMS Student Affairs, 2014
NJMS Alumni Association Grant, 2011
Richard Pozen and Ann Silver Pozen Community Scholar, 2011
Armstrong Engineering Scholarship Award, 2007
Oval Society Award, Community Service Distinction, 2007
Nitin Agarwal, MD

**Publications: 2016-17**

- **Refereed Articles:**


Resident Biographies

Nitin Agarwal, MD


Resident Biographies

Nitin Agarwal, MD


*Books:*

*Presentations:*

Resident Biographies

Nitin Agarwal, MD


Resident Biographies

Nitin Agarwal, MD


Prabhu AV, Crihalmeanu T, Hansberry DR, Agarwal N, Fine MJ. "A Health Literacy Readability Analysis of Online Allergy and Immunology-Based Patient Education Resources." American Academy of Allergy, Asthma, & Immunology Annual Meeting, Atlanta, Ga., March 3-6, 2017.


Nitin Agarwal, MD

Resident Biographies


• Online Reference:
Nima Alan, MD
PGY-2 Resident

Nima Alan, MD, joined the University of Pittsburgh neurosurgery residency program in July 2015. He graduated from Case Western Reserve University School of Medicine with the Distinction in Research and Distinction in Teaching. He previously graduated from University of British Columbia, Vancouver, B.C. in 2010 with a degree in honors physiology. Dr. Alan’s research in undergraduate focused on spinal cord injury, for which he received the Top Student in Neurophysiology award. While in medical school, he studied outcomes in neurosurgery with focus on spine surgery, for which he received the AANS Best Medical Student Abstract Award. Dr. Alan’s hobbies include international traveling, soccer, tennis and yoga.

Specialized Areas of Interest
Complex spine, cerebrovascular surgery, microvascular decompression.

Professional Organization Membership
American Academy for Advancement of Science
American Association of Neurological Surgeons
American Stroke Association
Congress of Neurological Surgeons
North American Spine Society

Honors and Awards
AANS Best Medical Student Abstract award (2012, 2013)
American Academy of Neurology Research Fellow
Dean’s Summer Research Award, Case School of Medicine
Dean’s Honor List, University of British Columbia
Distinction in Research and Teaching, Case School of Medicine
President’s Entrance Scholarship, University of British Columbia
Research Assistant Professional Development Award, University of British Columbia
Summer Scholarship, University of British Columbia
Top Student in Neurophysiology, University of British Columbia
Trek Excellence Scholarship, University of British Columbia
Undergraduate Student Research Award, Natural Sciences Research Council
Wai-Man Leung Memorial Bursary, University of British Columbia

Publications: 2016-17
• Refereed Articles:
Hanna Algattas, MD  
**PGY-1 Resident**

Hanna Algattas, MD, joined the University of Pittsburgh Department of Neurological Surgery residency program in June of 2016 after graduating from the University of Rochester School of Medicine. He previously graduated from summa cum laude from Colgate University with a degree in cellular neuroscience. Prior to matriculation to medical school, Dr. Algattas worked with animal models of Alzheimer’s disease at the NINDS. Dr. Algattas has been involved in research regarding traumatic brain injury pathophysiology and management, cost-effectiveness in neuro-oncology, and outcome improvement after cranial and spinal surgery using the NSQIP database. He has broad interests within neurosurgery encompassing all of the sub-specialties. Dr. Algattas was born and raised in Syracuse, N.Y. Interests outside neurosurgery include weightlifting, squash, professional sports, and crossword puzzles.

**Professional Organization Membership**  
American Association of Neurological Surgeons  
Congress of Neurological Surgeons

**Education & Training**  
BA, Cellular Neuroscience, Colgate University, 2012  
MD, University of Rochester Medical School, (Md.) 2016

**Honors and Awards**  
Young Neurosurgeons Forum Oral Presentation, AANS, 2015  
Office of Medical Education Research Award, University of Rochester SOM, 2013  
James M. Maury MD Endowed Scholarship, Colgate University, 2012  
Elias J. Audi Scholarship, Colgate University, 2012  
Charles A. Dana Scholar, Colgate University, 2012  
Dr. Leo Speno Health Sciences Prize, Colgate University, 2012  
William K. Edmonton Neuroscience Award, Colgate University, 2012

**Publications: 2016-17**  
• Presentations:  

Edward Andrews, MD  
**PGY-1 Resident**

Edward G. Andrews, MD, began his residency with the University of Pittsburgh Department of Neurosurgery in July of 2016. Dr. Andrews attended the University of Pennsylvania, graduating summa cum laude in 2009 with a degree in neuroscience and ancient Egyptian studies. He subsequently earned his medical degree from Sidney Kimmel Medical College at Thomas Jefferson University in 2016, graduating magna cum laude. During his medical school career, he directed the Future Docs High School Program, a pipeline program aimed at exposing underrepresented minority high school juniors and seniors to different career choices in healthcare fields. He also organized and participated in the primary tutoring services on campus, helping medical students struggling with course material and clinical rotations. His research interests include neuroimmunologic changes in mild traumatic brain
injury and immunotherapeutic approaches to glioblastomas. He also has an avid interest in resident and medical student education. Dr. Andrews is a native of Philadelphia, Pa.

Specialized Areas of Interest
Neuro-oncologic neurosurgery; neurotrauma; skull base neurosurgery.

Professional Organization Membership
American Association of Neurological Surgeons
American Board Neurologic Surgery
American Medical Association
Congress of Neurological Surgeons

Education & Training
BA, University of Pennsylvania, 2005-2009
MD, Sidney Kimmel Medical College, 2012-2016

Honors and Awards
Dean’s list, University of Pennsylvania, 2006-2009
Summa cum laude, University of Pennsylvania
Magna cum laude, Sidney Kimmel Medical College
McClellan Surgical Honor Society, Sidney Kimmel Medical College
Alpha Omega Alpha (junior inductee), Sidney Kimmel Medical College
Gold Humanism Honor Society, Sidney Kimmel Medical College
Pathology Program for Advanced Study, Sidney Kimmel Medical College
Hobart Amory Hare Honor Society, Sidney Kimmel Medical College
William F. Keller Prize, Sidney Kimmel Medical College, 2016

William J. Ares, MD
PGY-5 Resident

William J. Ares, MD, began his residency with the University of Pittsburgh Department of Neurosurgery in July of 2012. He graduated from Johns Hopkins University in 2006 with a degree in psychological and brain sciences and earned his medical degree from the University of Vermont in 2012. During his medical school career Dr. Ares was elected to the Alpha Omega Alpha Medical Honor Society and also received an Alpha Omega Alpha Student research fellowship for his work investigating the molecular mechanisms of cerebral vasospasm following subarachnoid hemorrhage. Dr. Ares will spend his PGY-5 and PGY-6 years pursuing subspecialty fellowship training in the field of endovascular neurosurgery.

Specialized Areas of Interest
Vascular neurosurgery.

Honors and Awards
Alpha Omega Alpha Student Research Fellowship, 2011
Johns Hopkins University Dean’s List, 2005-06

Publications: 2016-17
• Refereed Articles:
Resident Biographies


• Presentations:

Christopher Deibert, MD
Chief Resident

Christopher Deibert, MD, joined the University of Pittsburgh neurosurgical residency program in July of 2010. Son of Paul and Carol Deibert of Pottsville, Pa., Dr. Deibert received his undergraduate degree from Goucher College and his medical degree from the University of Pittsburgh. In June of 2017, Dr. Deibert completed his residency training at the University of Pittsburgh and accepted a position at Emory University in Atlanta, Ga.

Specialized Areas of Interest
Neuro-oncology; stereotactic radiosurgery; neuro-trauma.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Neurosurgeons
International Stereotactic and Radiosurgery Society
National Brain Tumor Society
Watson Humanism Honor Society

Honors and Awards
American College of Rheumatology REF Abbott Fellowship
Ashlee DeSanctis Award for Outstanding Leadership
CAC Academic All-American
Captain Men’s Varsity Swim Team, Goucher College
Outstanding Teaching Assistant University of Florida
American Association of Neurological Surgeons, Ronald L. Bittner Award on Brain Tumor Research, 2016

Publications: 2016-17
• Refereed Articles:


Amir Faraji, MD, PhD
PGY-4 Resident

Amir Faraji, MD, PhD, joined the University of Pittsburgh neurosurgical residency program in July of 2013. He graduated from the Medical Scientist Training Program at the University of Pittsburgh School of Medicine in 2012 after completing his PhD in chemistry in 2011. He graduated as valedictorian from the University of Florida in 2005. Dr. Faraji’s research interests focus on developing novel drug delivery systems for the central nervous system, including nanotechnology and convection-enhanced delivery. Dr. Faraji is a native of Clearwater, Fla.

Specialized Areas of Interest
Nanotechnology, drug delivery, brain tumors, stereotactic and functional neurosurgery, minimally invasive cranial surgery

Professional Organization Membership
Allegheny County Medical Society
American Association for the Advancement of Science
American Association of Neurological Surgeons
American Chemical Society
American Medical Association
American Physician Scientists Association
Congress of Neurological Surgeons

Honors and Awards
MSTP Post-Doctoral Research Fellowship
United States Delegate, 2010 Lindau Nobel Laureates Meeting
Clinical & Translational Research Pre-Doctoral Research Fellowship
Chemistry Graduate Excellence Fellowship, University of Pittsburgh
Program for Excellence in Science, American Association for the Advancement of Science
Valedictorian, College of Liberal Arts and Sciences, University of Florida
Florida Academic Scholars Award
Anderson Scholar, University of Florida
University of Florida Research Scholar
Society of Neurological Surgeons/RUNN Course Resident Award, 2016

Publications: 2016-17
• Refereed Articles:
Gurpreet S. Gandhoke, MD
PGY-6 Resident

Gurpreet S. Gandhoke, MD, began his neurosurgery residency at the University of Pittsburgh in July of 2013. He completed his medical school and master’s degree in surgery at the University of Pune, India. He graduated from a neurosurgery residency with a gold medal at the King George’s Medical University in India. Dr. Gandhoke came to the United States in 2009, and spent time pursuing neurosurgical research at the Barrow Neurological Institute in Phoenix and at the University of California, San Francisco. After completing a clinical pediatric neurosurgery fellowship at Northwestern University in Chicago, he came to the University of Pittsburgh Medical Center for a fellowship in spine surgery in July 2012.

Specialized Areas of Interest
Spine; general neurosurgery.

Board Certifications
Medical Council of India for Neurosurgery and General Surgery

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons
North American Spine Society
Life Member Neurosurgical Society of India
Life Member Neurotrauma Society of India

Honors and Awards
Stroke-Net Fellowship, National Institutes of Health, 2016-17
Sanford Larson Award, American Association of Neurological Surgeons Annual Meeting, 2016.
Mayfield Clinical Science Award, Spine Section of the American Association of Neurological Surgeons, 2015
Sanford-Larson Research Award, for Excellence in Neurosurgical Research, Spine Section of the American Association of Neurological Surgeons, March 2013.
Sonntag International Fellowship, Spine Section of the American Association of Neurological Surgeons, 2011.
Gold Medal, King Georges Medical University, Lucknow, 2009.
Congress of Neurological Surgeons Travel Award, 2009.
Gold Medal, BJ Medical College, 2005

Editorial Service
• Ad Hoc Reviewer:
  British Journal of Neurosurgery
  Journal of Neurology, Neurosurgery and Psychiatry
  PLOS one Neurosurgery
  European Radiology
  BioMed Central Surgery
Resident Biographies

Gurpreet S. Gandhoke, MD

**Publications: 2016-17**

- **Refereed Articles:**
  


- **Book Chapters:**
  


- **Published Abstracts:**
  

- **Presentations:**
  


  Gandhoke GS. "Development of new neurological deficits in the absence of significant somatosensory evoked potential (SSEP) changes, a subset analysis of 88/4489 patients." American Association of Neurological Surgeons Annual Meeting, Los Angeles, Calif., April 22-26, 2017.
Ezequiel Goldschmidt, MD, PhD
PGY-4 Resident

Ezequiel Goldschmidt, MD, PhD, was born in Buenos Aires, Argentina. He received his medical degree from The University of Buenos Aires where he graduated Suma Cum Laude. He obtained his PhD focusing on tissue regeneration from the same university. He completed a neurosurgery residency program at Buenos Aires Italian Hospital. Dr. Goldschmidt joined the University of Pittsburgh Department of Neurological Surgery residency program in 2015 as a PGY-3.

Specialized Areas of Interest
Dural healing and tissue repair after surgery.

Board Certifications
Argentinian Boards of Neurological Surgeons

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Education & Training
MD, Buenos Aires University School of Medicine
PhD, Buenos Aires University School of Medicine

Honors and Awards
Charlie Kuntz Scholar Award, AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves, 2016

Publications: 2016-17
• Refereed Articles:

Resident Biographies

Ezequiel Goldschmidt, MD, PhD

• Presentations:


Stephen A. Johnson, MD

PGY-5 Resident

Stephen A. Johnson, MD, joined the department residency program in June of 2012. He received his medical degree from the University of Pennsylvania. He also received his BA degree from Penn, graduating summa cum laude in 2008. Dr. Johnson is a native of Spring Lake, N.J.

Publications: 2016-17

• Refereed Articles:

Philip S. Lee, MD, PhD

PGY-6 Resident

Philip S. Lee, MD, PhD, joined the department residency program in June of 2011 after graduating from the University of Pittsburgh School of Medicine. He received a BA degree in psychology from The George Washington University in 1998 and PhD degree in clinical psychology from George Mason University in 2005. He also completed an internship in clinical child psychology at Children’s National Medical Center in 2005 and a postdoctoral fellowship in developmental cognitive neuroscience at Georgetown University in 2007. Dr. Lee is a native of Kingsport, Tenn.

Specialized Areas of Interest

Epilepsy; functional neurosurgery.

Professional Organization Membership

American Association of Neurological Surgeons
American Psychological Association
Cognitive Neuroscience Society
Congress of Neurological Surgeons
Society for Neuroscience

Honors and Awards

Theodore Kurze Senior Prize in Neurological Surgery and Clinical Neuroscience, University of Pittsburgh, 2011
Dean’s Summer Research Merit Award, University of Pittsburgh, 2008
Resident Biographies

Publications: 2016-17
• Refereed Articles:


Michael McDowell, MD
PGY-3 Resident

Michael McDowell, MD, joined the University of Pittsburgh Department of Neurological Surgery residency program in July of 2014 after graduating from Columbia University’s College of Physicians and Surgeons medical school. He received undergraduate degrees in biochemistry and Latin dance from Arizona State University in 2005, graduating as valedictorian. During medical school, Dr. McDowell was elected into Alpha Omega Alpha and received funding to pursue a Doris Duke Clinical Research Fellowship investigating the mechanisms by which genetic and environmental factors alter aneurysm morphology. He subsequently received funding from the Brain Aneurysm Foundation to continue his work during residency. Dr. McDowell was heavily involved in teaching and community outreach during medical school and was voted clinician of the year for his contributions to the Columbia Student Medical Outreach clinic in Washington Heights. His current research interests include the alteration of vascular malformations from childhood to adulthood, Chiari Malformation, clinical applications of near infrared spectroscopy, and the objectification of clinical outcomes using mobile software platforms. His interests outside of neurosurgery include medical education, dance, and theater. Dr. McDowell is the son of Douglas and Marti McDowell of Iron Mountain, Mich.

Specialized Areas of Interest
Health care improvement, Chiari malformation, pediatric neurosurgery, cerebrovascular disease, health software development.

Professional Organization Membership
Alpha Omega Alpha
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Interdepartmental and Medical Center Activities
• University of Pittsburgh:
Advisor, Neurosurgery Interest Group

Honors and Awards
Doris Duke Clinical Research Fellow, 2012
Brain Aneurysm Foundation Christopher Getch Chair of Research, 2013
Cook Medical Neurocritical Care Research Grant, 2014
Copeland Grant Winner, 2015
Michael McDowell, MD

Resident Biographies

AANS/CNS Spine Summit Charlie Kuntz Scholar, 2016
Gold medal, lumbar pedicle screw placement, American Association of Neurological Surgeons Top Gun surgical completion, 2017

Publications: 2016-17

• Refereed Articles:


• Letters to the Editor:

• Book Chapters:


• Presentations:

W. Christopher Newman, MD
PGY-5 Resident

W. Christopher Newman, MD, began his residency with the University of Pittsburgh Department of Neurosurgery in July of 2012. He graduated from Harvard University in 2008 with a degree in biomedical engineering and earned his medical degree from the University of Florida in 2012. During his medical school career, he started a faculty-student career mentorship program for medical students and was awarded the Senior Excellence in Neurosurgery Award at the University of Florida for his work on healthcare disparities in vascular neurosurgery. He also was awarded The University of Florida College of Medicine Anne L. Copeland Award for his contributions to health equity. Dr. Newman was born in Orlando, Fla.

Specialized Areas of Interest
Neurosurgical oncology; healthcare socioeconomics; trauma.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Honors and Awards
Pittsburgh Foundation Copeland Award Recipient, 2016
Pittsburgh Foundation Copeland Award Recipient, 2015
University of Pittsburgh Department of Neurological Surgery Stuart Rowe Day Co-Runner-Up Presentation Award, 2014
University of Florida College of Medicine Anne L. Copeland Award, 2012
Maren Room Creativity Award and Grant, 2010

Publications: 2016-17
• Refereed Articles:


• Invited Papers:
Kamil W. Nowicki, MD, PhD
PGY-1 Resident

Kamil W. Nowicki, MD, PhD, began his residency with the University of Pittsburgh Department of Neurosurgery in June of 2016. He graduated from University of Florida in 2008 with a degree in chemistry with the highest honors and earned his combined medical degree and a PhD in molecular cell biology from the University of Florida College of Medicine in 2016. During his medical school career, he conducted research in the department of neurosurgery under mentorship of Brian L. Hoh, MD, and Edward W. Scott, PhD. In his dissertation research he showed that blockade of shear stress-induced CXCL1 chemokines prevents cerebral aneurysm formation. He was awarded two research grants from the Brain Aneurysm Foundation. He was also the recipient of the Equal Access Clinic award for his work as director of a mobile clinic site while providing care for the underserved population of Gainesville, Fla. in 2012 and 2013. His current research efforts are focused on studying the platelet inflammatory axis in cerebral aneurysm formation and healing. Dr. Nowicki was born in Poland and moved to Gainesville in 2001. His hobbies include soccer, digital photography, and cross-fit.

Specialized Areas of Interest
Chemokines, hemodynamics, intracranial aneurysms, cerebrovascular surgery, biomedical engineering, inflammation, and shear stress.

Professional Organization Membership
American Association of Neurological Surgeons
American Heart Association: Council on Atherosclerosis, Thrombosis, and Vascular Biology
American Medical Association
American Physician Scientist Association
Congress of Neurological Surgeons

Education & Training
BS, Chemistry, University of Florida, Summa cum laude, 2008
PhD, Molecular Cell Biology, University of Florida College of Medicine, 2014
MD, University of Florida College of Medicine, 2016

Honors and Awards
Brain Aneurysm Foundation: Timothy P. Susco Chair of Research Grant Award, 2016
Brain Aneurysm Foundation: Dawn Brejcha Chair of Research Grant Award, 2016
UF MD-PhD Training Program: Outstanding Academic And Research Accomplishment
Award, 2016
UF College of Medicine Travel Award, 2015
Medical Guild Competition – Bronze Award, 2014
Brain Aneurysm Foundation: Shirley Dudek Demmer Chair of Research Grant Award, 2013
Equal Access Clinic Award, 2013
Brain Aneurysm Foundation: North Shore University Hospital, Brain Aneurysm Center
Chair of Research Grant Award, 2012
Equal Access Clinic Award, 2012
Kamil W. Nowicki, MD, PhD

Resident Biographies

UF MD-PhD Training Program Scholarship, 2008
Bachelor of Science in Chemistry, summa cum laude, University of Florida, 2008
Colonel Allen R. and Margaret G. Crow Award, 2008
Sanibel Symposium Superior Poster Award, 2007
Anderson Scholar of High Distinction, 2006
Florida Bright Futures Scholarship, 2005

Publications: 2016-17
• Book Chapters:
  Kashkoush J, Kashkoush A, Nowicki KW. Methods and Impact of Improving Health Literacy.

• Presentations:

Enyinna Nwachuku, MD

PGY-2 Resident

Enyinna L. Nwachuku, MD, began his residency with the University of Pittsburgh Department of Neurological Surgery in July of 2015. He graduated from the University of Pittsburgh in 2010 with a degree in neuroscience, and subsequently earned his medical degree from the University of Pittsburgh in 2015. Along with three other colleagues from medical school, Dr. Nwachuku is a co-founder of a national and locally funded, non-profit, after-school organization called The Healthy Minds Academy which is a program geared toward at-risk youth in the public school systems of Pittsburgh. Dr. Nwachuku was born in Nigeria. Interests outside of neurosurgery include cinema, traveling, and global/public health disparities.

Specialized Areas of Interest
Pediatric neurosurgery; functional and stereotactic neurosurgery; neurotrauma.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Neurosurgeons
Pennsylvania Medical Society

Honors and Awards
American Psychiatric Foundation “Helping Hands Grant”
Career Education Enhancement for Health Care Diversity (CEED) Grant
Carolyn Carter Gateway Medical Society 4th Year Medical Student Scholarship
Gateway Medical Society Scholarship Recipient
National Institute of Mental Health R25 Grant
National Medical Association Emerging Scholar Award
Pennsylvania Medical Society Medical Education Scholarship
Student National Medical Association-Physician Research Initiative Fellow
Publications: 2016-17
• Refereed Articles:
• Presentations:

Alp Ozpinar, MD
PGY-2 Resident

Alp Ozpinar, MD, a native of Istanbul Turkey, joined the University of Pittsburgh neurosurgery residency program in July of 2015 after receiving his medical degree from Oregon Health and Science University. He previously graduated with highest honors from University of California, Davis in 2009 with a degree in biomedical engineering. While in medical school, Dr. Ozpinar was elected to Alpha Omega Alpha as a junior, and was awarded the School of Medicine Research Award and Outstanding Medical Student Scholarship upon graduation. During medical school Dr. Ozpinar studied the natural history and long-term outcomes of trigeminal neuralgia. He also conducted research on long-term outcomes for DREZ procedure for brachial plexus avulsion, role for simultaneous decompressive craniectomy for high grade SAH, and molecular marker analysis for primary and secondary GBMs. Dr. Ozpinar is an avid tennis player and occasionally competes in men’s open tennis tournaments. His other hobbies include fishing, running and home improvement.

Specialized Areas of Interest
Cerebrovascular neurosurgery; endoscopic endonasal and skull base neurosurgery; scoliosis and complex spinal deformity.

Professional Organization Membership
Alpha Omega Alpha
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Turkish American Doctors Association of Midwest

Honors and Awards
Dean’s List, UC Davis
Junior Alpha Omega Alpha
McGraw-Hill/Lange Award, 2013
National Dean’s List, 2009
OHSU Annual Award for Excellence Scholarship
OHSU Outstanding Medical Student Scholarship, Class of 2015
OHSU School of Medicine Research Award
OHSU Student Educator Award
OHSU Student Service Award
Resident Biographies

Alp Ozpinar, MD

Presidential Scholar, UC Davis
Turkish American Doctors Association of Midwest Research Scholarship
Charlie Kuntz Scholar Award, AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves, 2016

Publications: 2016-17
• Refereed Articles:


David Panczykowski, MD

PGY-6 Resident

David Panczykowski, MD received his bachelor’s degree from Clemson University in 2006 while concurrently employed as a fire fighter with the Clemson Fire Department. He matriculated to the University of Miami School of Medicine, where he had the opportunity to participate in research at the Miami Project to Cure Paralysis. Dr. Panczykowski was later selected for the Campagna Scholarship in Neurological Surgery at Oregon Health and Science University in 2008, completing research on cerebral vasospasm. In 2009, he performed a Doris Duke Clinical Research Fellowship at the University of Pittsburgh as well as a Traumatic Brain Injury Research Fellowship under David O. Okonkwo, MD, PhD. Dr. Panczykowski continues to participate in the study of cerebrovascular lesions and neurotrauma.

Specialized Areas of Interest
Cerebrovascular surgery; cranial and spinal trauma; skull base surgery.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Honors and Awards
American Cancer Society Research Scholarship, University of Miami, 2009
John K. Robinson Award for Student Initiatives, University of Miami, 2008
Runner-up Presentation Award, Stuart Rowe Research Day, 2013
Walter L. Copeland Award, 2014
Matthew Pease, MD
PGY-2 Resident

Matthew Pease, MD, joined the University of Pittsburgh Department of Neurological Surgery residency program in July of 2015 after graduating from the University of Southern California’s Keck School of Medicine. He received his undergraduate degree in economics from Duke University in 2010. Prior to matriculating to medical school, Dr. Pease explored a variety of research topics including animal models of addiction through a Howard Hughes research fellowship, learning modules through fellowship at the National Institutes of Health, and game theory models of group conflict. During medical school, Dr. Pease earned an American Association Medical Student Research fellowship to investigate the epigenetics of pituitary adenomas. He continues his interests in economics and brain tumor research during residency. Outside of neurosurgery, Dr. Pease enjoys hiking, college basketball and football, and theater.

Specialized Areas of Interest
Brain tumors.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Honors and Awards
American Association of Neurological Surgeons Medical Student Fellowship
Howard Hughes Medical Institute Research Fellowship
National Institutes of Health Research Fellowship
Resident Biographies

Matthew Pease, MD

**Publications: 2016-17**

- **Refereed Articles:**
  


Christian B. Ricks, MD

PGY-5 Resident

Christian Ricks, MD, entered the University of Pittsburgh Department of Neurological Surgery residency program in July of 2012 after receiving his medical degree from the Baylor College of Medicine. He also has both BS and MS degrees in genetics and biotechnology from Brigham Young University. In 2015-2016 he completed an infolded spine fellowship with Drs. Adam Kanter and David Okonkwo, focusing on minimally invasive approaches and spinal deformity correction. He is currently completing a year of neurocritical care fellowship working under Dr. Lori Shutter.

**Specialized Areas of Interest**

- Neurocritical care; neurotrauma; scoliosis and complex spinal deformity; minimally invasive spine surgery; spinal biomechanics

**Professional Organization Membership**

- American Association of Neurological Surgeons
- Congress of Neurological Surgeons

**Honors and Awards**

- Pittsburgh Foundation Copeland Award Recipient, 2012
- Society of Neurological Surgeons RUNN Award, 2014

David Salvetti, MD

PGY-4 Resident

David J. Salvetti, MD, began his residency with the University of Pittsburgh Department of Neurosurgery in July 2013. He graduated from Vanderbilt University in 2009 with a BE in biomedical engineering, and then attended the University of Virginia School of Medicine, graduating in 2013. During both undergraduate and medical school, Dr. Salvetti was involved in neurosurgery research ranging from software development to the clinical outcomes of Gamma Knife surgery. During residency his research has focused on the clinical outcomes of elective spine surgery. Dr. Salvetti was born in Willow Grove, Pa., and grew up in east Tennessee. Outside neurosurgery his interests include mechanics, hiking, fishing, and other outdoor pursuits.

**Media Appearances: 2016-17**

“For this UPMC surgeon, music is an important prescription for a successful procedure,” March 1, 2017, *Pittsburgh CityPaper.*
Jeremy Stone, MD  
PGY-3 Resident

Jeremy Stone, MD, joined the University of Pittsburgh Department of Neurological Surgery residency program in July of 2014. He completed his undergraduate work at Case Western Reserve University, attaining magna cum laude honors with dual degrees in biology and psychology. A native of Hawaii, Dr. Stone returned home to the University of Hawaii John A. Burns School of Medicine to pursue his medical degree. He was recognized as a leader in his class, taking on the role of president of the American Medical Association Chapter and serving as delegate to the Hawaii Medical Association. He also led many community service outreach projects. Dr. Stone’s academic achievement was acknowledged with election into the Alpha Omega Alpha Honor Medical Society. Dr. Stone’s research interests include traumatic brain injury systems-based improvement, evaluation of surgical outcomes in spinal deformity, vascular neurosurgery and molecular mechanisms underlying neurodegenerative disease. Outside of the hospital and research lab, Dr. Stone enjoys spending time with his wife and three kids, hiking, playing sports, and surfing the Monongahela River.

Specialized Areas of Interest
Tumor; vascular; skull base.

Professional Organization Membership
Alpha Omega Alpha  
American Association of Neurological Surgeons  
Congress of Neurological Surgeons  
Phi Beta Kappa

Honors and Awards
Frank and Mary McDowell Award for Excellence in Surgery, 2014  
Po’okela No’i’i Award for Outstanding Research, 2014  
Windsor and Mary Cutting Excellence in the Basic Sciences Award, 2014  
American College of Physicians Bernard Yim, MD, Award for Top Performance in Internal Medicine, 2013

Publications: 2016-17
- Presentations:
  Stone JG, Tempel ZJ, Okonkwo DO, Monaco EA. “Placement of Bridging Bone Allograft within the Atlantoaxial Joint: A Novel Adjunct Technique for Screw-Based C1-2 Arthrodesis.” American Association of Neurological Surgeons (AANS) Annual Scientific Meeting, Los Angeles, Calif., April 22-26, 2017.

Zachary Tempel, MD  
Chief Resident

Zachary J. Tempel, MD, graduated summa cum laude from Miami University in 2006 with degrees in zoology and french. In 2010, he received his medical degree from the Indiana University School of Medicine. During medical school, Dr. Tempel was elected to Alpha Omega Alpha as a junior. Additionally, he was awarded the inaugural Julius M. Goodman scholarship for excellence in neurological surgery. As a senior medical student, Dr. Tempel was selected as a Pittman Surgical Scholar for academic achievement in surgery. After completing his residency training at the University of Pittsburgh in June of 2017, Dr. Tempel accepted a position with Mayfield Brain & Spine in Cincinnati, Ohio.
Resident Biographies

Zachary Tempel, MD

Specialized Areas of Interest
Minimally invasive spine surgery; degenerative spine conditions, scoliosis and complex spinal deformity; outcome measures and cost-effectiveness in spine surgery; biomechanics and spinopelvic alignment; traumatic brain injury and concussions.

Professional Organization Membership
Alpha Omega Alpha
American Association of Neurological Surgeons
Congress of Neurological Surgeons
Society of Lateral Access Surgery

Honors and Awards
NuVasive Young Investigator Award, SOLAS Annual Research Meeting, 2016
Charlie Kuntz Scholar Award, CNS/AANS Joint Spine Section, 2016
Runner-up Presentation Award, Stuart Rowe Research Day, 2014
Inaugural Julius M. Goodman Award in Neurosurgery 2010
Pittman Surgical Scholarship 2010
BT Maxam Scholarship, 2009
Joseph, Samuel and Donald Ferrara Scholarship, 2007
ED Johns Fellowship, 2007
Summa Cum Laude, Miami University, 2005
W.R. Krickenberger Memorial Scholarship, 2003
William Marion Miller French Scholarship, 2004
L.H. Skinner Memorial French Award, 2005
Culler Physics Award, 2005

Publications: 2016-17
• Refereed Articles:

• Presentations:
Daniel Tonetti, MD
PGY-3 Resident

Daniel A. Tonetti, MD, joined the Department of Neurological Surgery residency program in July of 2014. He graduated with honors from Drexel University with BS and MS degrees in chemical engineering. Prior to matriculation into medical school, he was employed within the pharmaceutical industry in both drug discovery and vaccine manufacturing. Dr. Tonetti earned his medical degree from the University of Pittsburgh in 2014, where he was elected by his peers as president of his class and was elected to Alpha Omega Alpha as a junior. Dr. Tonetti is a native of Keedysville, Md.

Specialized Areas of Interest
Cerebrovascular neurosurgery, stereotactic radiosurgery, complex spine.

Professional Organization Membership
Alpha Omega Alpha Medical Honor Society
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Honors and Awards
Theodore Kurze Senior Prize for Excellence in Neurological Surgery and Clinical Neurosciences

Publications: 2016-17
• Refereed Articles:
Gregory M. Weiner, MD  
*PGY-6 Resident*

Gregory M. Weiner, MD, joined the department in July of 2011. He graduated with honors from the University of California, Berkeley with a degree in molecular neurobiology in 2006 and subsequently earned his medical degree from Tulane University in 2011. During his medical school career he was elected to the Alpha Omega Alpha as well as the Arnold P. Gold Humanism in Medicine Honor Society. Dr. Weiner was born and raised in Los Angeles.

**Specialized Areas of Interest**
Vascular neurosurgery.

**Professional Organization Membership**
- Alpha Omega Alpha Honor Society
- American Association of Neurological Surgeons
- Arnold P. Gold Humanism in Medicine Honor Society
- Congress of Neurological Surgeons
- Neurocritical Care Society

**Honors and Awards**
- National Collegiate Scholars Award, 2002
- California Alumni Leadership Scholarship, 2002
- Honors Award-Molecular and Cell Biology, UC Berkeley, 2006
- Arnold P. Gold Humanism in Medicine Award, 2011
- Outstanding Achievement Award in Internal Medicine Clerkship, 2011
- Stuart Rowe Lectureship Runner-Up Presentation Award, 2015, 2016

**Media Appearances: 2016-17**
“For this UPMC surgeon, music is an important prescription for a successful procedure,” March 1, 2017, *Pittsburgh CityPaper*.

**Publications: 2016-17**

- **Refereed Articles:**


- **Presentations:**
Georgios A. Zenonos, MD
PGY-6 Resident

Georgios joined the Department of Neurological Surgery in July of 2011. He was born and raised in the Mediterranean island of Cyprus. After high school, Dr. Zenonos served a 26-month military service as an officer before matriculating in the University of Athens Medical School in Greece with a full scholarship from the Ministry of Education. Graduating as the valedictorian of his medical school class, he received the Alexander S. Onassis Scholarship to join the Neuroapoptosis Laboratory at Brigham and Women’s Hospital, Harvard Medical School. During residency, Dr. Zenonos developed a special interest in skull base neurosurgery, and completed a two-year enfolded fellowship with Drs. Paul Gardner, Juan C. Fernandez-Miranda, Carl H. Snyderman, and Eric W. Wang in endoscopic and open skull base surgery.

Specialized Areas of Interest
Skull base surgery; cerebrovascular surgery; complex spine, genetics of skull base tumors, chordoma, pharmacologic neuroprotection, skull base anatomy, clinical outcomes research.

Professional Organization Membership
Alexander S. Onassis Scholars Association
American Association of Neurological Surgeons
Congress of Neurological Surgeons
North American Skull Base Society

Honors and Awards
Stuart Rowe Lectureship Best Presentation Award, 2016
Chordoma Foundation Travel Scholarship, 2016
Top ABNS written exam score in the United States, 2016
Robert Dempsey Cerebrovascular Research Award by the AANS/CNS CV section, 2015
Alexander S. Onassis Scholarship for Post-Graduate Studies, 2010
Valedictorian, University of Athens Medical School, 2008
Baronos Award for Excellence in Pharmacology, University of Athens Medical School, 2005
Hellenic National Scholarship Foundation Award, 2002-08
Top graduate, Military Officer Academy, Megalos Pefkos, Greece, 2001
National Physics Olympiad Prize, 2000

Xiaoran (Zel) Zhang, MD
PGY-1 Resident

Xiaoran (Zel) Zhang, MD, MS, joined the University of Pittsburgh Neurological Surgery residency program in June of 2016 after graduating from the University of Pittsburgh School of Medicine. Dr. Zhang obtained a combined BS/MS degree from the Department of Microbiology, Immunology, and Molecular Genetics at University of California, Los Angeles. His master’s thesis was titled “Role of Vitamin D in the Toll-induced Antimicrobial Responses.” During medical school, Dr. Zhang was selected to participate in the Clinical Scientist Training Program and was awarded a master’s level certificate in clinical research. Additionally, he studied the mechanisms of immune escape in isocitrate dehydrogenase mutant gliomas. He was awarded the The Theodore Kurze Senior Prize for excellence in Neurological Surgery and Clinical Neurosciences. Dr. Zhang is a native of Henan, China.
Resident Biographies

Xiaoran (Zel) Zhang, MD

Specialized Areas of Interest
Neuro-Oncology, cerebrovascular diseases, and neurotrauma.

Professional Organization Membership
American Association of Neurological Surgeons
Congress of Neurological Surgeons

Honors and Awards
The Theodore Kurze Senior Prize for Excellence in Neurological Surgery and Clinical Neurosciences, 2016
Clinical Scientist Training Program Grant, 2014
Walter L. Copeland Neurological Surgery Medical Student Research Fellow, 2015

Publications: 2016-17
• Refereed Articles:

Benjamin M. Zussman, MD
PGY-4 Resident

The son of a physician, Benjamin Zussman, MD, was exposed to the field of medicine from an early age and scrubbed for his first neurosurgical operation at age 15. He studied public health, epidemiology, and social policy at Haverford College; biostatistics at the University of Pennsylvania, and medicine at Thomas Jefferson University. Dr. Zussman served as a 2015-16 socioeconomic fellow of the Council of State Neurosurgical Societies, and he is an enfolded neuroendovascular surgery fellow at UPMC. His clinical interests include vascular neurosurgery and spine surgery.

Interdepartmental and Medical Center Activities
• UPMC:
  Resident member, Interdisciplinary Committee, UPMC Technology Development Center

• University of Pittsburgh:
  Compensation and Benefits Subcommittee, Graduate Medical Education Committee

Publications: 2016-17
• Refereed Articles:
Nathan Zwagerman, MD  
*Chief Resident*

Nathan T. Zwagerman, MD, graduated from Calvin College in 2006 with a degree in psychology. In 2010, he received his medical degree from Wayne State University School of Medicine. During medical school, Dr. Zwagerman was elected to Alpha Omega Alpha as a junior. Additionally, he was awarded the Student's Golden Heart Award. He was awarded the AANS Synthes Skull Base Award in 2016 and the AANS First place peripheral nerve E-poster award in 2017. Dr. Zwagerman—born and raised in Holland, Mich.—enjoys traveling, hiking, playing basketball, fishing and other outdoor activities. After completing his residency training at the University of Pittsburgh in June of 2017, Dr. Zwagerman accepted a position as assistant professor of neurosurgery with the Medical College of Wisconsin.

**Specialized Areas of Interest**  
Skull base surgery; craniovascular surgery; trauma.

**Honors and Awards**  
First place peripheral nerve E-poster award, 2017 American Association of Neurological Surgery Annual Scientific Meeting  
Synthes Skull Base Award, Best Abstract Related to Skull Base Surgery, 2016 American Association of Neurological Surgery Annual Scientific Meeting.  
Student’s Golden Heart Award, Wayne State University School of Medicine, 2010

**Publications: 2016-17**

- **Refereed Articles:**
  
  
  
  

- **Presentations:**
Chief Resident Graduation Dinner

Chief resident Chris Diebert with wife Amy and family members.

Chief resident Zach Tempel with wife Claire and family members.

Chief resident Nate Zwagerman with wife Lisa and family members.

Chief resident wives Claire Tempel, Lisa Zwagerman and Amy Diebert.

Ajay Niranjan and L. Dade Lunsford with residents Benjamin Zussman and Ezequiel Goldschmidt.

Eugenia Friedlander (c) with Ray Sekula and wife Anne.
Edward Andrews with fiancé Lucy Hill.

Stephen Johnson with fiancé Sydney.

New residents Zachary Gersey, Roberta Sefcik, David Fernandes Cabral and Justiss A. Kallas.

Daniel Tonetti with guest Molly Hlavay.

Enyinna Nwachuku with guest Brittany Moore.

Robert Friedlander with 2017-18 chief residents and wives. [Missing: Gurpreet Gandhoke.]
Chief Resident Graduation Dinner

Dr. Friedlander with department residents.

Gregory Weiner with Michael McDowell and guest Renee Krugger.

Ben Zussman, David Salvetti, Ezequiel Goldschmidt and Amir Faraji.

Zach Tempel (r) with 2013 program graduate Matthew Tormenti and wives.

Xiaoran Zhang with wife Nupur Gupta.

Resident “better halves.”
Dr. Friedlander addresses dinner audience.

Kourosh Tavanaiepour receives spine fellowship diploma from D. Kojo Hamilton, David Okonkwo and Robert Friedlander.

Christian Ricks receives spine fellowship diploma from Drs. Hamilton, Friedlander and Okonkwo.

Drs. Friedlander and Richardson present functional neurosurgery fellowship diploma to Philip Lee.

Georgios Zenonos accepts endoscopic cranial base surgery fellowship diploma from Robert Friedlander and Paul Gardner.

Zach Tempel, Chris Diebert and Nate Zwagerman. Congratulations and best wishes!
The goal of the Department of Neurological Surgery at the University of Pittsburgh is to improve the care and treatment of patients with neurosurgical disease. This goal is being achieved partly though the conduct of state-of-the-art basic and translational research. The department, with more than 40 faculty members and investigators, seeks to be at the forefront of this endeavor; and numerous advances have already been achieved—research translated into practice.

Annually, the department has been highly ranked in National Institutes of Health funding, a direct result of the success and quality of our research and development. In the past fiscal year, our faculty and residents were involved in almost 120 research projects having a total budget award of almost $12 million. Total department research funding increased by nearly 20% over fiscal year 2016. Since fiscal year 2010, the department’s total research funding has increased by almost 150%.

Ongoing research includes the disciplines of molecular biology, neurophysiology, neurochemistry, neuroanatomy, neuroradiology and other neuroscience arenas. Specific questions addressed include research into the acute and chronic care following neurotrauma, neural recovery and plasticity, the neurobiologic and therapeutic response in neuro-oncology, the underlying mechanisms and treatment of epilepsy and movement disorders, cell death and radiation injury, and cerebrovascular physiology and modeling. The department provides an outstanding research environment for fellows, residents, and students seeking training in neurosurgical research.

Intramural research support for junior faculty and residents is available through the Walter L. Copeland Fund. The Walter L. Copeland Fund was established at The Pittsburgh Foundation in 1961, with instructions that the entire annual proceeds support cranial research in the Department of Neurosurgery at the University of Pittsburgh. More than $2 million has been granted for various research projects. In November 2001, the neurosurgical space on the ninth floor of Scaife Hall were dedicated as the Walter L. Copeland Laboratory for Neurosurgical Research.
Research
Overview

The Walter L. Copeland Laboratory

The Walter L. Copeland Laboratory serves as a central facility for research and development within the Department of Neurological Surgery. Located on the ninth floor of Scaife Hall, the laboratory was dedicated on November 29, 2001 by L. Dade Lunsford, MD. The laboratory houses several research disciplines and core facilities which provide resources and services for a wide range of neurosurgery faculty, residents, visiting fellows, and students. Core services in the areas of biochemistry, histology, and immunohistochemistry are offered in this facility. Neurotrauma, brain tumor, brain imaging, and neuroanatomical research are the primary initiatives being conducted in the laboratory. A significant amount of this work is funded by The Walter L. Copeland Fund of The Pittsburgh Foundation, a fund that has provided resources for research at the University of Pittsburgh since 1961.

The laboratory for Clinical Neurotrauma Research Team is located in the Copeland Laboratory. Led by David O. Okonkwo, MD, PhD, the team conducts innovative clinical research on brain monitoring methods and biomarkers as well as the evaluation of neurotherapeutics for traumatic brain injury.

The Surgical Neuroanatomy Laboratory and the Fiber Tractography Laboratory are also located in the Copeland Laboratory. Both of these laboratories are under the direction of Juan C. Fernandez-Miranda MD. Residents and visiting fellows train in neuroanatomy and the development of minimally invasive endoNeurosurgical approaches to the brain. New routes to various brain locations are developed using in vitro models.

The Fiber Tractography Lab is focused on the application of HDFT for presurgical planning and intraoperative navigation to facilitate brain function preservation and improve resection rates in patients with complex brain lesions. The laboratory’s work is also centered on studying the structure and connectivity of the fiber tracts forming the “normal” human brain, and their structural alteration in patients with brain tumors, vascular lesions, stroke, and neurodegenerative diseases.

Wendy Fellows-Mayle, PhD, is coordinator of the Copeland Laboratory.

Neurotrauma Research

C. Edward Dixon, PhD, directs the Department of Neurological Surgery’s Brain Trauma Research Center (BTRC) at the University of Pittsburgh. The BTRC is a multidisciplinary, multidisciplinary research program aimed at improving outcome following severe traumatic brain injury. Research conducted both at our Center and at other brain injury research programs clearly demonstrates the potential for improving outcomes using therapies designed to treat biochemical derangements that occur following impact to the brain. In order to identify the most critical of these sequelae of brain injury and to find newer therapies that are effective in treating them, the BTRC has established several basic science head injury laboratories and clinical research projects.

David O. Okonkwo, MD, PhD, leads the department’s efforts in clinical neurotrauma research. Clinical brain injury research is wide spanning and includes clinical trials funded by federal agencies and industry to study new therapies, novel brain monitoring, advanced neuroimaging, and biomarkers. The center also houses the National TBI Biospecimens Repository. This repository, under the direction of Ava Puccio, RN, PhD, is the largest centralized collection of biological samples from traumatic brain injury patients in the United States. The Department of Neurological Surgery has pioneered efforts using hypothermia and cerebral blood flow monitoring in the treatment of severe head injury and has conducted landmark investigations into the mechanisms of induction and recovery of head trauma and secondary injury.
Research

Overview

The Safar Center for Resuscitation Research is directed by Patrick Kochanek, MD, of the Department of Critical Care, and has a strong collaborative and productive relationship with several members of the Brain Trauma Research Center. Dr. Dixon serves as an associate director of the Safar Center. This facility includes basic science laboratories directed by Dr. Dixon. The mission of the Safar Center is to improve understanding of the mechanisms of secondary injury after traumatic brain injury, cardiopulmonary arrest, severe hemorrhage from whatever cause, and to contribute to the development and implementation of novel and increasingly more effective therapies.

In 2017, two new faculty members—Nilkantha Sen, PhD, and Tanusree Sen, PhD —joined our department to facilitate a stronger approach in neurotrauma research. Nilkantha Sen’s research is elucidating molecular mechanisms associated with pathology of TBI; cognitive dysfunction, memory impairment and vision impairment following TBI; pre-clinical testing of potential compounds against TBI in mice model. Tanusree Sen is studying the influence of oncogenic transcription factors on the TBI-pathology; regulation of immune response and its influence on cognitive dysfunction following TBI; studying the role of resident microbial cells on TBI-pathology.

Brain Tumor Research

• Basic Science Advances

Our brain tumor basic science research program is a world-class effort focused on delivering novel brain tumor therapies from the laboratory to the bedside. Areas of active investigation include immunotherapy, signal transduction pathways that contribute to the growth of tumor cells, oncolytic viruses, and the development of preclinical animal models for the treatment of brain tumors.

At the core of our program is a commitment to personalized medicine and the development of patient-specific therapies. This commitment begins in the operating room, where a portion of most tumor samples is retrieved for laboratory investigation. These specimens are critical to the development of translational targets for brain tumor therapy. This initiative has led to the banking and study of hundreds of unique tumor samples, facilitating personalization of brain tumor care for future generations of patients.

Brain tumors are inherently immunosuppressive. Each tumor develops unique mechanisms to escape natural anti-tumor immune responses. We have recently discovered a unique immune escape mechanism that involves silencing of immune recognition genes. Importantly, we have discovered that a new class of tumor drugs, called 'hypomethylating agents', can awaken the expression of these genes and allow effective immune responses in IDH mutant gliomas. A Phase I clinical trial is currently being designed based on these findings.

Previous work in our brain tumor program identified new vaccine strategies for the treatment of gliomas. Researchers in our group developed glioma-associated antigen peptide vaccines to boost tumor-specific immune responses. Phase I clinical trials of these vaccines demonstrate robust induction of antigen-specific immune responses and some clinical activity in both adult and pediatric patients with glioma. These trials are ongoing at the University of Pittsburgh Cancer Institute and Children’s Hospital of Pittsburgh.

Another strategy in brain tumor research is to inhibit the pathways that promote tumor growth or to stimulate those that promote tumor cell killing. The poor response of malignant gliomas to conventional therapies, such as cytotoxic chemotherapy or radiotherapy, reflects resistance of these tumors to undergoing apoptosis in response to DNA damage or mitogen depletion. Through a large-scale screening study, we have identified several
exploitable targets, which when inhibited induce tumor cytotoxicity. We have been examining pharmacological agents to inhibit these targets, alone and in combination with agents that induce apoptotic signaling in these tumors. These preclinical studies are coupled with a robust clinical trials effort in association with the Adult Brain Tumor Consortium and the Pediatric Brain Tumor Consortium (PBTC), which are examining novel molecularly targeted agents in the treatment of these tumors.

The clinical research branch of our Brain Tumor Program currently runs “personalized” clinical studies based on patients’ gene markers, such as human leukocyte antigen (HLA)-A2 (for immunotherapy studies), epidermal growth factor receptor (EGFR) variant III and chromosome 1p/19q co-deletion. In addition, the program offers a host of molecularly targeted treatment approaches for children whose brain tumors have genomic alterations that make them ideally suited for specific novel-agent trials. These include studies of MEK inhibitors (e.g. AZD6244) for children with BRAF-altered low-grade gliomas, which are being conducted by the PBTC.

Similarly, members of our group are studying rare skull base tumors such as chordoma by performing whole exome sequencing to search for novel genetic alterations in these tumors that could lead to a better understanding of their oncogenesis as well as targets for treatment. In addition, our surgeons and pathologists have identified a molecular panel that can help predict chordoma clinical behavior and prognosis.

• Clinical Care Advances

Currently, clinical care of patients with skull base tumors, primary brain tumors and metastatic brain tumors related to systemic cancer represent a major focus for our department’s activities. During the last 28 years, the Center for Image Guided Neurosurgery has provided care to more than 20,000 patients with such tumors as an adjuvant or alternative minimally invasive treatment strategy. One of the most important adjuvant strategies to control brain tumor progression is optimization of radiation delivery techniques. Using technologies such as Gamma Knife® radiosurgery at UPMC Presbyterian (over 14,500 patients and more than 500 published articles) and Cyberknife and True beam technologies at UPMC Shadyside, methods to enhance the efficacy and safety of radiation delivery have been pioneered. The International Gamma Knife Research Foundation and corporate entities have funded UPMC to perform radiosurgery for recurrent malignant gliomas coupled with bevacizumab as part of a phase 2 clinical trial. Long term outcome assessments have been completed for patients with metastatic brain cancer, a condition where radiosurgery often has replaced conventional radiation therapy as the initial procedure.

Since 1975 the department has been noted as a source of innovation in brain tumor diagnosis and management. In 1981 the first dedicated CT scanner was installed in a dedicated operating room at UPMC Presbyterian to facilitate minimally invasive surgical techniques. Updated in 2009, this facility also serves a site to explore less invasive strategies for tumor removals such as endoport resection using guiding technologies coupled with endoscopic removal. Working hand in hand with our skull base program innovative combined strategies for tumor biopsy or removal followed by adjuvant radiosurgery, chemotherapy, or immunotherapy has offered new advances in patient care resulting in ever longer high quality outcomes.

Another exciting area of research in our department involves the development of genetically engineered oncolytic herpes-simplex viruses that can selectively kill proliferating glioma cells but not normal brain cells. Promising preclinical studies in mouse models indicate that this strategy is highly effective for the treatment of glioblastoma. Further safety testing
Research

Overview

In preclinical models is warranted to move this strategy into clinical trials. Other elements of this work involve studying improvements to virus delivery and intratumoral viral spread.

Innovative imaging techniques are being developed and applied to better understand brain tumors and their structural relationship with surrounding white matter tracts. High-Definition Fiber Tractography (HDFT) provides a superior presurgical evaluation of the fiber tracts for patients with complex brain lesions, allowing us to reconstruct fiber tracts and design a less invasive trajectory into the target lesion. We are currently investigating its potential for not only presurgical planning and intraoperative navigation but also for neurostructural damage assessment, estimation of postsurgical neural pathway damage and recovery, and tracking of postsurgical changes, neuroplasticity, and responses to rehabilitation therapy. The ultimate goal is to facilitate brain function preservation and recovery in patients undergoing complex brain surgery.

These basic and translational research efforts are also coupled with active clinical programs in radiosurgery and minimally invasive neurosurgery, discussed elsewhere in this report.

Pediatric Neurotrauma Center

The Pediatric Neurotrauma Center (PNTC), under the leadership of Michael J. Bell, MD, (Critical Care Medicine) and Mandeep Tamber, MD, PhD, has both basic science and clinical research programs aimed at understanding the pediatric response to neural injury as well as the unique elements of recovery that are specific to traumatic central nervous system injuries in children. This section coordinates services for injured children at Children’s Hospital of Pittsburgh, which operates the region’s only Level I pediatric trauma center. The goal of the center is to provide optimal care between the time of injury and discharge. Subspecialists in all pediatric medical and surgical disciplines are readily available to provide definitive care. As one of the most established and comprehensive programs in the country, the PNTC has been at the forefront of pediatric neurotrauma research not only locally but also nationally and internationally, serving as an important resource for collaborative programs such as multi-institutional clinical trials designed to improve outcomes as well as efforts aimed at developing consensus clinical guidelines for the care of children with traumatic neurological injury. Research is progressing at a vigorous pace, with the completion of the “Cool Kids” trial, the implementation of several new phase I/II clinical trials, the start of a comparative effectiveness study to discern barriers to implementation of evidenced-based guidelines and the continuing support of a T32-training grant in pediatric neurocritical care.

Neurophysiology Research

Research focus at the Center for Clinical Neurophysiology is aimed at analyzing the utility of intraoperative neurophysiological monitoring (IOM) to predict and prevent post operative neurological complications during adult and pediatric neurosurgical, orthopedic, ENT, cardio-thoracic, vascular and interventional neuroradiology procedures.

This research is achieved by reviewing electrophysiological data collected during surgical procedures by 1) critically evaluating the current modalities utilized in IOM, 2) developing and validating new techniques to reduce post operative complications, and 3) evaluating the use of modalities during various surgical procedures.

The research team at the CCN works closely with surgeons and researchers in the departments of orthopedic, ENT, cardiothoracic, and vascular surgery on various research projects.

Bioengineering research, under the direction of Mingui Sun, PhD, is developing a novel skin-surface EEG electrode that requires no electrolyte application, is self-adhearing to the unshaved scalp, and has low and stable impedance.
Magnetoencephalography (MEG) Research
The aim of MEG research, directed by Avniel Singh Ghuman, PhD, is to facilitate, develop, and advance clinical and basic neuroscience research using magnetoencephalography. To this end, Dr. Ghuman is helping to develop new research applications for MEG in collaboration with researchers throughout the community.

MEG is the most powerful functional neuroimaging technique for noninvasively recording magnetic fields generated by electrophysiological brain activity, providing millisecond temporal resolution and adequate spatial resolution of neural events.

MEG is currently being used to study the healthy brain, both in adults and during development, in order to understand the neural basis of cognitive processes, including reading, vision, audition, motor control, semantic memory, executive functioning, emotional processing, and working memory. Furthermore, groups in the community are also using MEG to understand how neural processing is disturbed in a host of pathologies, including TBI, schizophrenia, spinal cord injury, HIV-AIDS, epilepsy, autism spectrum disorders, Alzheimer's disease, and Parkinson's disease.

The MEG contributes substantially to neuroscience funding in Pittsburgh. The MEG center is set to contribute to over $16 million in federally funded research over the next four years.

Cognitive Neurodynamics
The Laboratory of Cognitive Neurodynamics, under the direction of Avniel Ghuman, PhD, studies how our brain turns what falls upon our eyes into the rich meaningful experience that we perceive in the world around us. Specifically, the goal of these studies is to examine the spatiotemporal dynamics of how neural activity reflects the stages of information processing and how information flow through brain networks responsible for visual perception. The lab is particularly interested in the dynamic neural representation of faces, bodies, objects, words, and social and affective visual images. This work by the Laboratory of Cognitive Neurodynamics is supported by a Biobehavioral Research Award for Innovative New Scientists from the National Institute of Mental Health and a Brain Initiative grant from the National Science Foundation.

Neuroapoptosis Research
The focus of the Neuroapoptosis Laboratory at the University of Pittsburgh Department of Neurological Surgery, under the direction of Robert Friedlander, MD, is the study of the basic mechanisms of apoptosis, as mediated by the caspase apoptotic family in neurologic diseases. In addition, discovering novel approaches to ameliorate the impact of cell death in a variety of neurologic diseases is a central theme of the Neuroapoptosis Laboratory.

The lab is evaluating the impact of apoptotic cell death, and in particular, that mediated by the caspase cell death family on the pathogenesis of neurodegenerative diseases. Neurodegenerative diseases presently being investigated are Amyotrophic Lateral Sclerosis (ALS) as well as Huntington's Disease (HD). Activation of the caspase cell death cascade appears to play an important role in a variety of neurodegenerative diseases. Researchers have demonstrated that inhibition of the Caspase-1 (also known as ICE) apoptotic gene slows the progression and delays mortality in transgenic mouse models of ALS and Huntington's disease. Furthermore, delivering caspase inhibitors directly in to the brain of these transgenic mice prolongs their survival. This was the first time that any intervention had been demonstrated efficacious in a HD model. Adding relevancy to these findings, researchers have also demonstrated that caspase-1 is activated in the brain and spinal cord of humans with HD and ALS respectively. They also have demonstrated that Minocycline demonstrates neuroprotection in a mouse model of HD.
Research

Overview

Apoptotic cell death plays a significant role in stroke as well as traumatic brain and spinal cord injury. Researchers are evaluating the impact ICE family activation has on apoptotic cell death in these conditions. The relation of the caspase family and free radical production is also being investigated as well as targeted caspase-mediated pharmacoprotection.

Using in vitro models, researchers are evaluating both the mechanisms involved in the activation of ICE, as well as the post-ICE activation pathways involved in cell death. The role of Interleukin-1b in apoptosis continues to be a focus of research. Researchers are also continuing to evaluate the basic mechanisms of cell death, and especially as they relate to neurologic diseases.

Brain Modulation Laboratory

The Brain Modulation Laboratory, led by R. Mark Richardson, MD, PhD, is a human systems neuroscience lab that studies brain electrophysiology, cognition, imaging, and histopathology in patients undergoing surgery for epilepsy and movement disorders. The overall goal of the lab’s work is to facilitate the optimization of brain modulation therapies and the discovery of novel neurobiological targets, by filling gaps in our understanding of human brain function critical for helping patients. Areas of study include:

• Basal Ganglia-Cortical Dynamics in Human Behavior
  Intraoperatively, task-based, simultaneously recorded cortical ECoG and subcortical MER/LFP data is collected to study interactions between the cortex and basal ganglia that code for specific components of motor action.

• Cortical Effects of DBS Studied with Magnetoencephalography
  One of the few research programs in the world using magnetoencephalography (MEG) to study the effects of DBS on cortical function.

• Brain Stimulation for Epilepsy
  A data management and analysis pipeline was created to study recordings generated in epilepsy patients implanted with the Responsive Neurostimulation System (RNS). Similarly, the effects of chronic stimulation are investigated in a NHP with idiopathic epilepsy, implanted with a sensing enabled DBS device (RC+S).

• GABAergic Innervation of Human Epileptic Hippocampus
  The lab has built a large brain bank of en bloc hippocampal specimens resected during epilepsy surgery. Current studies are focused on defining bouton-level alterations in GABAergic innervation of dentate granule cell neurons.

Neurodegeneration Research

Robert Friedlander, MD, is investigating the neuropathology and mechanisms of neurodegeneration in adult-onset neurological diseases. Pre-clinical drug trials in mouse models of neurological disease act as a conduit of therapeutic agents for direct translation to human clinical trials in Huntington’s disease and amyotrophic lateral sclerosis patients. A major goal of current clinical research is to identify parallels in peripheral and central biomarker detection of disease and manifestations of neuronal dysfunction with translation to potential disease-modifying therapies that are being developed and evaluated in the clinical setting, especially in early stage disease. The goal is to create a data set of multiple markers that can be used with multivariate techniques to develop a unique biochemical signature relating to neurological diseases and to evaluate correlative biomarkers and biomarkers in response to therapy.
Fiber Tractography Laboratory
High-Definition Fiber Tractography (HDFT) is an advanced MRI-based non-invasive imaging technique used to study the intrinsic structure and connectivity of the living human brain, both in normal subjects and neurosurgery/neurology patients.

The Fiber Tractography Lab—under the direction of Juan C. Fernandez-Miranda, MD, and recently funded with a major NIH award—is focused on the application of HDFT for presurgical planning and intraoperative navigation to facilitate brain function preservation and improve resection rates in patients with complex brain lesions. Dr. Fernandez-Miranda's work is also centered on studying the structure and connectivity of the fiber tracts forming the "normal" human brain, and their structural alteration in patients with brain tumors, vascular lesions, stroke, and neurodegenerative diseases.

These are the main areas of research:

• Neuroanatomy of Fiber Tracts
Nearly two decades ago, Sir Francis Crick, neuroscientist, discoverer of the DNA molecule and 1962 Nobel Prize for Medicine, wrote: "to interpret the activity of living human brains, their neuroanatomy must be known in detail. New techniques to do this are urgently needed, since most of the methods now used on monkeys cannot be used on humans." Nowadays, HDFT allows doctors and scientists to investigate the intrinsic structure of the brain with unprecedented detail, which will invariably facilitate a better understanding of brain functioning.

Studies in the Fiber Tractography Lab have contributed to elucidate the structure, connectivity, and potential functional role of the Middle Longitudinal Fascicle, Superior Longitudinal Fascicle and Arcuate Tract. We have also completed studies on the superior fronto-occipital fascicle, the claustro-cortical connections, and the dentate-rubro-thalamic tract.

Innovative studies using data from the Human Connectome Project are being completed to further elucidate the complex anatomy of the brainstem pathways, inferior longitudinal fascicle, and cingulum.

• Presurgical Assessment of Fiber Tracts and Surgical Planning
HDFT provides a superior presurgical evaluation of the fiber tracts for patients with complex brain lesions, including low grade and high grade gliomas. Presurgical studies are built upon precise and accurate neuroanatomical knowledge, which allows doctors to reconstruct perilesional or intraklesional fiber tracts, design the less invasive trajectory into the target lesion, and apply more effectively intraoperative electrical mapping techniques for maximal and safe tumor resection in eloquent cortical and subcortical regions.

Our clinical experience applying HDFT has been reported in Neurosurgery, Journal of Neurosurgery, and Neuro-oncology among others; we are actively investigating its potential for not only presurgical planning and intraoperative navigation but also for neurostructural damage assessment, estimation of postsurgical neural pathways damage and recovery, and tracking of postsurgical changes and responses to rehabilitation therapy.

The latest innovation in the lab is HDFT reconstruction of cranial nerves for presurgical evaluation in skull base surgery, with very promising results. The ultimate goal is to facilitate brain function preservation and recovery in patients undergoing complex brain surgery.
• Fiber Tract Integrity and Damage Progression in Neurodegenerative Disorders
Researchers are currently studying patients with ALS and Huntington Disease aiming to obtain quantifiable measures of white matter tract integrity that can be correlated with the speed of disease progression and with clinical measures. The ultimate goal is to find an accurate biomarker of the disease that can be monitored and serve as a reference for treatment response.

• Language Connectivity Pathways and Neuroplasticity in Aphasic Stroke Patients
This research project is funded by NIH-NIDCD. Researchers are correlating specific white matter tract disconnections evidenced by HDFT with phonological and semantic deficits aiming to improve our understanding of language related pathways. Researchers are also investigating the neuroplasticity in this stroke population by determining whether targeted intensive behavioral therapy induces structural neuroplastic changes in perilesional and/or contralateral fiber tracts of aphasic patients and whether any observed neuroplastic changes are correlated with behavioral improvements and predict the potential for speech recovery.

Surgical Neuroanatomy Laboratory
The Surgical Neuroanatomy Lab (SNL)—under the direction of Juan C. Fernandez-Miranda, MD—has a dual educational and research role aiming to improve surgical techniques and outcomes by mastering knowledge of relevant surgical neuroanatomy.

Many national and international students, residents, and fellows have conducted training and research at the SNL during the last years. The working philosophy at the SNL is that of Albert L. Rhoton, Jr., MD: meticulous and exquisite anatomical microdissections to better understand the intricacies of the complex anatomy of the human brain and skull base.

The lab has three main research/educational areas: endoscopic skull base anatomy, microsurgical neuroanatomy, and white matter anatomy/brain connectivity/surgical planning.

• Endoscopic Skull Base Anatomy
The Endoscopic Endonasal Approach (EEA) has revolutionized skull base neurosurgery. The EEA has anatomical and technical advantages over open skull base approaches for the treatment of selected lesions. EEA is not minimally invasive but maximally effective for the treatment of a wide variety of skull base lesions. The Surgical Neuroanatomy Laboratory at the University of Pittsburgh has pioneered anatomical work on the area of skull base endoscopy, and its goal is to continue providing landmark contributions to the skull base community. Meticulous knowledge of the ventral skull base anatomy as seen from the endoscopic perspective is critical to apply endonasal endoscopic surgery in an effective and safe manner.

• Microsurgical Neuroanatomy
Conventional skull base approaches are being compared with novel endoscopic endonasal approaches to aid in understanding indications and limitations of different but complementary skull base approaches. Contemporary skull base surgeons should combine expertise in open and endoscopic skull base approaches to select the most appropriate approach and technique for each particular case. Emphasis is made on the circumferential conceptualization of the skull base and the selection of “anatomically-favorable” surgical routes.

• White Matter Anatomy
Dissection of the white matter fiber tracts provides a unique insight into the complex intrinsic architecture of the brain and builds up an essential knowledge for operating on intra-axial tumors. A unique feature of our white matter studies is the combination with advanced imaging techniques, such as High-Definition Fiber Tractography (HDFT), to facilitate greater understanding of brain connectivity “in-vivo” and in neurosurgery patients.
Investigator Research Summaries

Jeffrey Balzer, PhD
Associate Professor
Director, Clinical Services, Center for Clinical Neurophysiology
Director, Cerebral Blood Flow Laboratory

Dr. Balzer is currently investigating the effects of exercise on arterial stiffness and its relationship to cerebral blood flow. The study uses an intervention, cross-over design comparing sedentary behavior with mild and moderate exercise. Arterial stiffness is measured using pulse-wave velocity and cerebrovascular blood flow is measured using non-invasive transcranial Doppler examinations. The clinical implications of potential changes in peripheral and cerebrovascular processes, if confirmed, are significant for not only overall health but also for the potential prevention and treatment of degenerative diseases such as Alzheimer’s.

Dr. Balzer also is currently helping to develop a new surgical instrument, in collaboration with CMU robotic engineers, designed to increase the safety of tumor removal during surgery using an animal model. He and his collaborators have developed a sciatic tumor model that can mimic the same degree and type of EMG discharge seen during tumor removal in patients. The data collected from these experiments will be instrumental for “programming” the new device.

Diane L. Carlisle, PhD
Assistant Professor

In the past year, Dr. Carlisle implemented a new small molecule based differentiation protocol to generate human motor neurons from induced pluripotent stem cells (iPSCs) from sporadic ALS and control patients. Using these cells, she found specific mitochondrial differences between ALS and control motor neurons. Furthermore, Dr. Carlisle found that ALS motor neurons are more sensitive to certain types of cellular stress as compared with control motor neurons.

Donald J. Crammond, PhD
Associate Professor
Associate Director, Movement Disorder Surgery

Dr. Crammond’s major clinical research interest is the study of basal ganglia and cerebral cortical interactions related to the control of movement in movement disorders including Parkinson’s disease, dystonia and essential tremor. This is accomplished by recording neurophysiological data from micro-electrode recording (MER) in the basal ganglia and electrocorticography (ECoG/LFP) from sensorimotor cortex, to examine the physiological relationship between basal ganglia and cortical structures. This research examines how these cortical and subcortical neural structures are involved in different aspects of movement planning and movement execution by having human subjects perform various controlled behavioral tasks involving either speech or hand movements. The novel aspect is the study of the neural mechanisms that underlie human speech production. As we understand more about basal ganglia physiology and cortical-basal ganglia interactions, we hope this will also help us to improve the targeting for optimal DBS placement within the basal ganglia to treat movement disorder patients and decrease the incidence of post-operative speech deficits. We are also examining how DBS placement affects post-operative DBS programming parameters and the therapeutic efficacy of DBS. We have discontinued subcortical neurophysiological mapping in essential tremor patients as it is not beneficial to DBS placement.
Dr. Crammond is a co-investigator in a NINDS/UO1 funded research project investigating the role of the basal ganglia as well as basal ganglia and sensorimotor cortex interactions in various aspects of language coding and speech production.

Dr. Crammond is also a co-investigator in a USAMRAA/AFIRM II funded translational research project investigating the rate of peripheral nerve regeneration in a non-human primate model of long median nerve gaps. These studies apply electrophysiological techniques of using nerve conduction studies using compound muscle action potentials (CMAPs), somatosensory evoked potentials (SSEPs) and trans-cranial motor evoked potentials (Tc-MEPs) in order to assess the differential effect of various nerve growth factors on sensory versus motor nerves axonal regeneration.

Dr. Crammond's ongoing clinical research interest is to review clinical outcome data to determine the impact of various modalities of intra-operative neurophysiological monitoring (IONM) to prevent and/or reduce iatrogenic injury and to use neurophysiological mapping of the basal ganglia and cerebral cortex to map motor and language functions in various neurosurgical procedures, for example, in order to map and locate eloquent cortical areas in tumor resection and epilepsy surgeries.

Matt El-Kadi, MD, PhD
Clinical Professor
Vice Chair
Chief, Neurosurgery, UPMC Passavant
Director, UPMC Passavant Spine Center

Dr. El-Kadi’s current research activities are focused on the identification of risk factors associated with postoperative infection in spine surgery. In his practice, Dr. El-Kadi has documented an infection rate of 0.6% over a seven-year period. Practice improvement strategies at cursory review did not appear to be associated with a reduction in the rate of infection.

Johnathan Engh, MD
Associate Professor
Director, Neuroendopord Surgery Program
Director, Adult Neurosurgical Oncology

Dilatable port surgery, a new method for minimally invasive brain tumor surgery, has now been established and certified by the Technology and Innovative Practice Committee of the University of Pittsburgh for continued human use. A clinical trial of fluorescein for brain tumor surgery has also been a success. Continued studies examining the radiologic and behavioral effects of varying methods of brain cannulation in animal models are ongoing.

Juan C. Fernandez-Miranda, MD, FACS
Associate Professor
Associate Director, Center for Skull Base Surgery
Director, Surgical Neuroanatomy Lab
Director, Fiber Tractography (HDFT) Lab

1) Language connectivity pathways and neuroplasticity in aphasic stroke patients.

In this proposal, Dr. Fernandez-Miranda’s strategy is to combine innovative diffusion imaging techniques, behavioral assessment, and intensive speech therapy in patients with chronic stroke-related aphasia in order to establish the role of fiber tracts in language function, iden-
tify the consequences of their disruption, investigate the potential neuroplastic changes after treatment, and characterize the white matter structural factors that may influence recovery.

2) Structural Brain Mapping using High Definition Fiber Tracking.

This project uses High-Definition Fiber Tractography, an advanced MRI-based non-invasive imaging technique, to study the intrinsic structure and connectivity of the living human brain, both in normal subjects and neurosurgery/neurology patients.

Paul A. Gardner, MD
Associate Professor
Executive Vice Chair, Surgical Services
Neurosurgical Director, Center for Cranial Base Surgery

Dr. Gardner initiated a study involving the introduction and application of indocyanine green (ICG) endoscopic angiography to endoscopic endonasal skull base surgery. Under IRB approval, approximately 150 patients were evaluated for tissue perfusion, including tumor, normal tissue and reconstructive flaps. Initial review shows that flap viability is clearly predicted by ICG perfusion in the flap pedicle.

Dr. Gardner’s recent projects include refinement of a molecular prognostication panel evaluation for clival chordoma. Ninety-two tumors were evaluated for genetic alterations using FISH, LOH and IHC studies. The panel was refined using a multivariate analysis and a resultant, proposed division of tumors with clinical management pathways.

Dr. Gardner continues evaluation of clinical cohorts of patients with skull base tumors to show impact and outcomes of treatment, largely endoscopic endonasal surgery.

Dr. Gardner has a continued role as investigator for NeuroGel, an extracellular matrix-derived product for nerve repair. Completed experiments showing improved nerve recovery in rat model compared to standard of care (conduit or nerve allograft) following gap repair. The project has led to creation of a company (Renerva) which will attempt to bring the product through FDA approval.

Peter C. Gerszten, MD, MPH, FACS
Peter E. Sheptak Professor
Vice Chair, Quality Improvement
Director, Percutaneous Spine Service

Dr. Gerszten serves as the Neurosurgical Principal Investigator of the National Cancer Institute Supported Radiation Therapy Oncology Group Cooperative Clinical Trial entitled “Phase II/III Study of Single Dose Radiosurgery for Localized Spinal Metastases.” He continues to investigate the expanding role of radiosurgery for the treatment of both malignant as well as benign tumors of the spine. His work evaluating the successful use of cone beam computed tomography image guidance for spine radiosurgery for intradural tumors was published this year. Ongoing research includes the incorporation of spine radiosurgery into minimally invasive and percutaneous spine procedures. Dr. Gerszten’s research related to spine radiosurgery is conducted in cooperation with the International Spine Oncology Study Group as well as the International Spine Radiosurgery Consortium.

This year, Dr. Gerszten successfully developed and performed the first ever use of radiosurgery as an ablative tool for extracranial targets in a small animal model. This
study allowed for the evaluation of the clinical and histopathological effects of high dose radiosurgery on the rat dorsal root ganglion. The goal of these investigations is to evaluate the use of radiosurgery as a viable treatment option for neuromodulation of pain of spinal origin.

Dr. Gerszten’s clinical research focuses on the adoption of minimally invasive surgical treatments for disorders of the spine. Such minimally invasive techniques allow for decreased morbidity while improving outcomes in neurosurgical patients. Dr. Gerszten continues to expand and systematically analyze the clinical outcomes and safety profiles associated with the use of new spinal implant devices. Published works this year included a clinical outcomes evaluation of the successful use of zero-profile devices for multi-level anterior cervical spinal fusions surgeries as well as a longitudinal cohort investigation of the development of symptomatic adjacent level compression fractures following Balloon-Assisted Kyphoplasty. Other clinical research has documented the safety and efficacy of minimally invasive sacroiliac joint fusions using titanium screw implants for sacroiliac joint dysfunction. Finally, Dr. Gerszten continues to evaluate the role of posterior lumbar dynamic stabilization for motion preservation. A 10-year experience with these technologies was published in the peer review literature.

Dr. Gerszten’s clinical research also focuses on co-morbidities that may prevent patients, especially older patients, from achieving good clinical outcomes after elective lumbar spine surgery. Research performed in collaboration with members of the Department of Psychiatry and Department of Geriatrics and published this year documented the neuropsychiatric correlates of lumbar spine surgery in older adults.

Avniel Singh Ghuman, PhD
Assistant Professor
Director, MEG Research

Dr. Ghuman current studies are exploring the neural basis of high level visual processing to help answer the question of how our brain turns what falls upon our eyes into meaning. This work has included decoding brain activity associated with word reading, facial expressions, facial identity, and knowledge about objects. Additionally, the work involves stimulation of brain regions to draw causal connections between brain activity and particular perceptual functions.

Recent results from the lab have illustrated the neural dynamics underlying aberrant social processing in autism spectrum disorders. In addition, the lab has developed new machine learning methods for decoding network activity. The lab has also done an extensive analysis of the neurodynamics of brain networks at large.

Stephanie Greene, MD
Assistant Professor

Dr. Greene’s research studies feature Moyamoya studies including one identifying a noninvasive, radiation-free method of quantifying vascular reserve and a patient’s risk of stroke, both pre- and post-operatively. Another study seeks to standardize the anesthetic management of these patients to minimize their perioperative stroke risk. A third is investigating the relationship between the length of arterial indirect bypass and the degree of resultant neovascularization.
The outcomes of a large series of arteriovenous malformations treated at Children’s Hospital of Pittsburgh with a combination of gamma knife radiosurgery, endovascular embolization, and open surgery are being studied. The outcomes of myelomeningocele patients with regard to Chiari II malformation and tethered cord syndrome are being described in separate publications.

Esther Jane, PhD  
Research Assistant Professor

The prognosis for malignant glioma, the most common brain tumor, is still poor, underscoring the need to develop novel treatment strategies. Because glioma cells commonly exhibit genomic alterations involving genes that regulate cell-cycle control, there is a strong rationale for examining the potential efficacy of strategies to counteract this process. Researchers are examining the antiproliferative effects of the cyclin-dependent kinase inhibitor in malignant human glioma cell lines, with intact, deleted, or mutated p53 or phosphatase and tensin homolog on chromosome 10; intact or deleted or p14ARF or wild-type or amplified epidermal growth factor receptor.

Michael McDowell, MD  
PGY-3 Resident

Dr. McDowell is currently working to develop near infrared spectroscopy based systems that allow for the non-invasive detection of elevated intracranial pressure and cerebral perfusion.

Ian F. Pollack, MD  
A. Leland Albright Distinguished Professor  
Vice Chair, Academic Affairs  
Chief, Pediatric Neurosurgery  
Co-Director, Neurosurgical Oncology

Our group has continued an ongoing focus on molecular characterization of childhood brain tumors as a basis for identifying prognostic subsets and groups amenable to molecularly targeted therapy. Relevant publications regarding molecularly targeted therapy and genomic classification from last year are summarized in the 2016 department annual report. We have also continued our NIH funded activities that focus on immunotherapy for brain tumors. The following is excerpted from our recent *Neuro-Oncology* publication [Pollack et al. Immune responses and outcome after vaccination with glioma-associated antigen peptides and poly-ICLC in a pilot study for pediatric recurrent low-grade gliomas. *Neuro-Oncology* 18:1157-1168, 2016.]

Low-grade gliomas (LGGs) are the most common brain tumors of childhood. Although surgical resection is curative for well-circumscribed superficial lesions, tumors that are infiltrative or arise from deep structures are therapeutically challenging, and new treatment approaches are needed. Having identified a panel of glioma-associated antigens (GAAs) overexpressed in these tumors, we initiated a pilot trial of vaccinations with peptides for GAA epitopes in human leukocyte antigen–A2+ children with recurrent LGG that had progressed after at least two prior regimens.

Peptide epitopes for 3 GAAs (EphA2, IL-13Ra2, and survivin) were emulsified in Montanide-ISA-51 and administered subcutaneously adjacent to intramuscular injections of polyinosinic-polyctydilic acid stabilized by lysine and carboxymethylcellulose every three weeks for eight courses, followed by booster vaccines every six weeks. Primary endpoints were safety and T-lymphocyte responses against GAA epitopes. Treatment response was evaluated clinically and by MRI.
Fourteen children were enrolled. Other than grade 3 urticaria in one child, no regimen-limiting toxicity was encountered. Vaccination induced immunoreactivity to at least one vaccine-targeted GAA was observed in all 12 evaluable patients: to IL-13Ra2 in three, EphA2 in 11, and survivin in three. One child with a metastatic LGG had asymptomatic pseudoprogression noted six weeks after starting vaccination, followed by dramatic disease regression with >75% shrinkage of primary tumor and regression of metastatic disease, persisting >57 months. Three other children had sustained partial responses, lasting >10, >31, and >45 months, and one had a transient response.

GAA peptide vaccination in children with recurrent LGGs is generally well tolerated, with preliminary evidence of immunological and clinical activity.

**Daniel R. Premkumar, PhD**  
Research Assistant Professor

Gliomas are the most common primary tumors in adult central nervous system. Malignant glioblastoma is characterized by rapid cell proliferation, high invasion and genetic alterations. Despite advances in all these treatment modalities with aggressive surgical resection combined with irradiation and chemotherapy, the median survival remains poor. During malignant transformation, several genetic alterations are involved in glioma oncogenesis, including inactivation of tumor suppressor genes such as p16, Rb, p53 and PTEN, and amplification and overexpression of the CDK4 and EGFR genes. Avoiding apoptosis is integral to tumor development and resistance to therapy. The main goal of researchers is to elucidate links that exist between survival signaling and cell cycle regulatory pathways, and to exploit this information to develop novel therapeutic approaches to the treatment of glioblastoma.

During the cell division cycle, mitotic entry, spindle assembly, chromosome segregation and cytokinesis must all be carefully coordinated to ensure that the two daughter cells inherit all the genetic material required for further growth and development. When this process is disrupted, it can lead to cancer. Central to this coordination are several prominent protein kinases. A major area of interest to this group involves mechanistically understanding the regulatory function of Aurora kinases and cyclin dependent kinases (CDKs) in cell cycle regulation and how deregulation contributes to carcinogenesis. In another project, we explore the factors that regulate inactivation of the NF-κB pathway by proteasomal inhibitor, bortezomib in malignant human glioma cells and determining the mechanisms by which interruption of this process may lead to enhanced cell killing. Recently, it has been shown that interference of this pathway—genetically or pharmacologically—dramatically increases TRAIL and HDAC inhibitor-mediated apoptosis. In another project, the potential benefit of combining the CDK inhibitor dinaciclib with the Bcl-2/Bcl-xL antagonist ABT-737 has been demonstrated, and the advantages of simultaneously targeting both survival pathways in patients with glioma has been highlighted.

**Ava Puccio, RN, PhD**  
Assistant Professor of Neurological Surgery  
Co-Director, Neurotrauma Clinical Trials Center

The ultimate goal of Dr. Puccio’s career trajectory is to research innovative treatment paradigms for individualized care of TBI patients, with an emphasis on the secondary injury mechanisms following TBI. Mechanisms include temperature management, brain oxygenation optimization and genetic influences including variations and genomic, for example hypoxic signaling.
Recent clinical trials with David Okonkwo, MD, PhD, of pharmacotherapy in TBI patients have not shown efficacy, including a dose-escalation study of the neuroprotective agent NNZ-2566 in patients with moderate to severe TBI (GCS 4-12) and also progesterone, SyN-APSE trial on severe TBI patients. TBI heterogeneity has been indicated as a cause for failure of these trials. We are exploring innovative means to design more effective clinical trials.

Dr. Puccio’s additional clinical studies with Dr. Okonkwo include the prospective collection of demographics, blood and cerebrospinal fluid and neurological outcomes for the Neurotrauma Clinical Trials Center, saliva-based biomarkers and genetic repositories. Collaborative research is ongoing with Jed Hastings, PhD, of the University of Cincinnati examining the impact of brain seizure-like activity (spreading depressions) on recovery from TBI, and with Geoff Manley, MD, PhD, of the University of California, San Francisco, examining and refining a standard for data collection in TBI studies, suitable for use across the broad spectrum of TBI and to explore novel approaches for classification of the initial injury severity and outcome after TBI, making use of emerging technology. Dr. Puccio’s collaborative translational research continues with industry to validate a commercial handheld hematoma detector for detection of an intracranial blood clot in the acute setting.

R. Mark Richardson, MD, PhD, FAANS
Associate Professor
Director, Adult Epilepsy and Movement Disorders Surgery
Director, Brain Modulation Laboratory
Faculty Member, University of Pittsburgh Brain Institute

Dr. Richardson is principle investigator on a $3.3M grant from NINDS, awarded in September 2016 through the BRAIN Initiative U01 mechanism. He leads a multidisciplinary team of experts in cognitive and computational neuroscience from the University of Pittsburgh, Carnegie Mellon University and Johns Hopkins University who are studying how neuronal activity in the subthalamic nucleus (STN)—a component of the basal ganglia—is related to different aspects of speech, and how the STN interacts with the cortex to modulate speech. The brain activity of PD patients is recorded during DBS surgery as they are asked to perform a variety of speech tasks. The overall goals is to learn how the basal ganglia participate in the encoding of motor and linguistic speech information, and to understand how this information can be used to treat speech disorders.

The Brain Modulation Lab also is actively involved in the study of closed-loop brain stimulation technology for epilepsy, studying both sensing-enabled DBS in a nonhuman primate with idiopathic epilepsy and responsive neurostimulation data from patients implanted with the Neuropace device at UPMC.

Nilkantha Sen, PhD
Associate Professor

An impairment of memory function is one of the major outcomes following TBI. However, the mechanism has not been elucidated yet. In recent efforts, Dr. Sen has found that an induction of ER stress results in an inactivation of a transcription factor CREB and downregulation of a post-synaptic protein, PSD95 which ultimately leads to the cognitive dysfunction. These findings were recently published in the prestigious Journal of Neuroscience. Along with working in the field of studying memory functions following TBI, Dr. Sen has also been studying the effect of alteration in mitochondrial dynamics on synaptic functions following TBI.
One of Dr. Sen’s major strengths is to study the influence of gaseous neurotransmitter on structural and functional alteration of neurons following TBI. Ongoing projects related to studying the role of hydrogen sulfide in the impairment of memory have been published in *Molecular Cell*.

Vision impairment following TBI is also considered one of the most prominent outcomes and thousands of TBI survivors are suffering from vision related issues. Dr. Sen has shown a compelling evidence in support of the fact that TBI leads to a loss of retinal ganglion cells which are known to connect retina with the visual cortex. Dr. Sen has been continuing studies in this field and elucidating the molecular mechanism responsible for the loss of RGC following TBI.

**Tanusree Sen, PhD**
*Research Assistant Professor*

The activation of an oncogenic transcription factor in the peripheral tissues have been well studied; however, the influence of these factors on the brain function and neurological disorders have not been studied to that extent. Dr. Sen would like to elucidate the function of these transcription factors on several pathological outcomes of TBI, which is characterized by an induction of cell death, edema, inflammation and cognitive dysfunction.

Dr. Sen’s preliminary data indicate that a transcription factor, p63, which is a family member of the tumor suppressor, contributes to the pathological outcomes of TBI in several layers. In addition, Dr. Sen is in a process to understand the cellular and molecular mechanism of how p63 regulates the oxidative/ER stress, alteration in mitochondrial structure and function and cognitive impairment.

In addition, Dr. Sen have been working to understand whether the immune cells from the peripheral tissues contributes to brain immunological response following TBI. In general, the peripheral immune cells cannot enter unto the brain because they can not pass through the blood-brain barrier. However, in TBI patients the existence of peripheral immune cells has been identified, but their role in the pathogenicity has not been studied well. The major objective of this project is to understand how these cells enter into the brain and how/whether they function independently or in association with the residential immune cells in the brain.

In the last few years, Dr. Sen has studied the functional aspects of transcription factors such CREB and HIF1 and their contribution to release of a neurotransmitter, such as BDNF in the brain and neurogenesis and angiogenesis processes following TBI. Dr. Sen would like to combine her experience of studying oncogenic transcription factors and function of immunological cells with the expertise of studying several aspects of TBI-pathology to accomplish the goals and objectives of current projects.

**Jeremy Stone, MD**
*PGY-3 Resident*

Dr. Stone’s research interests involve the subspecialties of neuro-oncology tumor surgery, vascular neurosurgery, and skullbase neurosurgery. Current projects include:

1) Copeland Grant project involving development of novel surgical instrument which utilizes real-time neurophysiology feedback to make tumor surgery around cranial nerves safer. Animal research with rat tumor model commenced during the summer of 2016 and is ongoing in collaboration with the Carnegie Mellon University Department of Engineering.
2) Assessment of safety and cost-effectiveness of avoiding ICU stay for post-operative supratentorial brain tumor patients.

3) Implementation of novel evidence-based protocols for external ventricular drain placement and cerebrospinal fluid sampling in the neurological cerebrovascular intensive care unit. This ongoing project involves a prospective quality improvement initiative evaluating the impact of implementing a standardized protocol in the neurological cerebrovascular intensive care unit for external ventricular drain placement and cerebrospinal fluid sampling. By standardizing parameters such as use of peri-procedural antibiotics, head shave, wash, and prep, we hope to improve external ventricular drain-associated infection rates. Additionally, standardizing cerebrospinal fluid collection techniques and limiting routine sampling of cerebrospinal fluid are included as systems-based changes to limit infections in our vulnerable cerebrovascular patient population. Preliminary data analysis suggests over a 50% reduction in infection rates after implementation of the protocol.

4) Case report introducing a novel technique for posterior cervical fusion in the setting of trauma utilizing placement of bilateral interfacet anterior cervical fusion grafts.

5) Systems-based retrospective analysis of traumatic brain injury transfers to highest level trauma center before and after implementation of transfer guidelines in the state of Hawaii. This ongoing large retrospective study is evaluating the safety, efficacy, and cost effectiveness of more restrictive transfer guidelines to the highest level state trauma center for traumatic brain injury patients.

Mingui Sun, PhD
Professor

In the past year, Dr. Sun’s laboratory studied the following medical and health related devices and systems:

eButton: A body-worn, cookie-sized electronic device for a variety of real-world applications, including human dietary evaluation, behavioral assessment, lifestyle monitoring, navigation for the blind, military training, and behavioral telemedicine.

eHat: A hat-like device with a looking-down camera for training and learning, such as infant care training, medical procedure training, and general training of sophisticated skills involving hand manipulation.

eBelt: An electronic waist belt embed with sensors for monitoring the quality of life and safety of the elderly and people with mental disorders. The device is entirely passive requiring no human maintenance. It is powered by an energy harvester based on the repetitive motion of respiration.

DreamNest: A wearable device for home-based remote clinical evaluation of sleep. It has essential functions of the current polysomnography (PSG), but adopts a completely different design using a new type of electroencephalographic (EEG) electrode. The device is wireless and leadless.

Magic Socks: A pair of textile wearable devices that provide both massage and electric simulation functions. It is used as a therapeutic device for treatment of the restless leg syndrome, a neurological sensory motor disorder.
Linus: A hat-like textile wearable device that delivers controlled therapeutic lights to the eyes to adjust circadian rhythm related sleep disorders.

Cough Monitor: A wearable device that monitors coughing. It is used as a clinical tool for pulmonary physicians to evaluate patients with lung diseases.

Single-Unit Wireless EEG Sensor: A coin sized device that can be applied to the scalp quickly for the measurement of brain waves (EEG). It is used for evaluation of neurological functions at the point of case, sports field, battlefield, and patient transportation vehicles.

CardioShirt: A comfortable shirt embedded with electronic sensors and textile electrodes for the monitoring of vital signs.

Magnetic Hand Tracker: This unobtrusive wearable system includes a set of adhesive magnetic fingernails and a wristband. Hand motion and gesture are computationally tracked based on the acquired variation of magnetic fields by an array of magnetometers.

PUMP: Pressure Ulcer Monitoring Platform (PUMP) is a maintenance-free electronic sensor system placed under the legs of a hospital bed which automatically monitors human-performed body rotations for ulcer prevention.

Parthasarathy D. Thirumala, MD
Associate Professor
Director, Center of Clinical Neurophysiology

Perioperative neurological events like stroke, spinal cord injury, and delirium are new neurological disorders which are seen after a surgical procedure. In prospective clinical trials and small representative samples, patients who undergo cardiac, neurosurgical and non cardiac-non neurosurgery procedures are at increased risk of perioperative neurological events. In fact perioperative stroke, defined as neurologic deficits developing within 30 days of the procedure, is one of the most devastating complications after cardiac surgeries, occurring in 1 to 2% of CABG patients in the perioperative period leading to 5,000 to 35,000 case each year. Dr. Thirumala’s primary aim in this study is to evaluate the risk of in-hospital mortality and morbidity in patients with an episode of perioperative neurological events after surgical procedure using a state-wise database. His secondary aim is to evaluate the risk factors of unplanned readmissions in patients with perioperative neurological events. Data will be abstracted from the Healthcare Cost and Utilization Project (HCUP) California State Inpatient Databases (SID) for the years 2001 to 2011. Dr. Thirumala will identify several patient level and hospital level covariates, including the patient’s age, sex, ethnicity, admission type and status. He will identify various preoperative comorbidities and risk factors.

Fang-Cheng (Frank) Yeh, MD, PhD
Assistant Professor
Technical Director, High Definition Fiber Tracking Laboratory

1) A Population-Based Tractography Atlas

A comprehensive map of the structural connectome in the human brain has been a coveted resource for understanding how brain networks function under normal and pathological conditions. Dr. Yeh produced an expert-vetted, population-based atlas of the structural connectome derived from diffusion MRI data (N=842). This was achieved by creating a high-resolution template of diffusion patterns averaged across individual subjects and using
tractography to generate 550,000 trajectories of representative white matter fascicles. The trajectories were clustered and labeled by a team of experienced neuroanatomists. Multi-level network topology was illustrated by connectograms of the whole brain, subdivisions in the association, projection, and commissural pathways, and individual fiber bundles. This atlas of the structural connectome represents normative neuroanatomical organization of human brain white matter, complimentary to traditional histologically-derived and voxel-based white matter atlases, allowing for better modeling and simulation of brain connectivity for future connectomic studies as well as clinical and educational applications.

2) DSI Studio: an open-source tool for diffusion MRI fiber tracking

DSI (Diffusion Spectrum Imaging ) Studio has been applied to human and animal studies to investigate how major fiber pathways are affected by neurological and psychiatric diseases. Since its debut in 2008, DSI Studio has been downloaded more than 20,000 times. Since then it has attracted a growing number of users across major universities. Last year, DSI Studio facilitated 75 peer-reviewed journal publications and the number continues to grow exponentially. Currently, there are more than 1,000 registered users with an average rate of 20 new users per month. It has achieved more than ~25,000 downloads count since its debut. It is currently ranked the second most popular diffusion MRI tractography tool among eight other tools in the world, behind only TrackVis supported by Massachusetts General Hospital. At this growing trend, Dr. Yeh expects DSI Studio to take the leading position in the world within the next two years and bring further impact to the field of brain imaging studies.
<table>
<thead>
<tr>
<th>Source</th>
<th>Investigator</th>
<th>Title</th>
<th>Total Budget Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Laboratories</td>
<td>Ava Puccio</td>
<td>Blood Biomarker Candidate Study for Mild Traumatic Brain Injury</td>
<td>$210,303</td>
</tr>
<tr>
<td>Archeoptix Biomedical</td>
<td>Ava Puccio</td>
<td>NIRS Device for the Detection of Intra-Cranial Hematoma</td>
<td>$113,196</td>
</tr>
<tr>
<td>Army</td>
<td>David O. Okonkwo</td>
<td>In Vivo Neuroimaging Biomarker Panel for Chronic Traumatic Encephalopathy</td>
<td>$86,517</td>
</tr>
<tr>
<td>Banyan Biomarkers</td>
<td>Adam Kanter</td>
<td>VIGILANT--A Prospective Evaluation of UCH-L1 and GFAP Biomarker Kinetics After Mild Brain Injury Trauma</td>
<td>$2,510</td>
</tr>
<tr>
<td>Banyan Biomarkers</td>
<td>Ava Puccio</td>
<td>VIGILANT--A Prospective Evaluation of UCH-L1 and GFAP Biomarker Kinetics After Mild Brain Injury Trauma</td>
<td>$90,694</td>
</tr>
<tr>
<td>Baylor College of Medicine</td>
<td>Mandeep Tamber</td>
<td>A randomized controlled trial of anterior versus posterior entry site for cerebrospinal fluid shunt insertion</td>
<td>$24,733</td>
</tr>
<tr>
<td>Center for Commercial Appl</td>
<td>Mingui Sun</td>
<td>PUMP: Pressure Ulcer Monitoring Platform</td>
<td>$69,770</td>
</tr>
<tr>
<td>Children's Brain Tumor Fndn</td>
<td>Ian Pollack</td>
<td>Children's Brain Tumor Tissue Consortium</td>
<td>$26,948</td>
</tr>
<tr>
<td>Children's Hosp Philadelphia</td>
<td>Ian Pollack</td>
<td>Children's Brain Tumor Tissue Consortium</td>
<td>$51,437</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>Stephanie Greene</td>
<td>The Use of Transcranial Doppler in the Diagnosis of Hydrocephalus and Associated Conditions</td>
<td>$9,000</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>Yuanyuan Jiao</td>
<td>Drug Screening for ALS using patient-specific neurons</td>
<td>$1,460</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>D. Leronni</td>
<td>Development of HSV-vectors overexpressing AANAT in HD mouse model for gene therapy</td>
<td>$10,000</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>A. Rao</td>
<td>Efficacy of Retinoic Acid in Reversing Immune Evasion in IDH Mutant Gliomas</td>
<td>$15,000</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>R. Mark Richardson</td>
<td>Technology augmented objective neurological assessment</td>
<td>$907</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>R. Mark Richardson</td>
<td>Subthalamic Coding of Speech Production</td>
<td>$10,000</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>R. Mark Richardson</td>
<td>Improving seizure and neurocognitive outcomes in patients with the responsive neurostimulator for epilepsy</td>
<td>$10,000</td>
</tr>
<tr>
<td>Copeland Foundation</td>
<td>Y. Suo</td>
<td>The role of MiR-155 in ischemic/reperfusion induced hemorrhagic transformation</td>
<td>$10,000</td>
</tr>
<tr>
<td>Covidiem</td>
<td>Brian Jankowitz</td>
<td>High definition fiber tracking and europsychiatric testing before and after treatment of unruptured intracranial aneurysms</td>
<td>$9,995</td>
</tr>
<tr>
<td>Defense Advn Res Proj Agency</td>
<td>Elizabeth Tyler-Kabara</td>
<td>Neural Control of Dextorous Manipulation and Translation to a Portable System</td>
<td>$24,424</td>
</tr>
<tr>
<td>Department of Defense</td>
<td>David O. Okonkwo</td>
<td>Targeted Evaluation, Action &amp; Monitoring of TBI (TEAM-TBI)</td>
<td>$829,859</td>
</tr>
<tr>
<td>Department of Defense</td>
<td>David O. Okonkwo</td>
<td>TBI Biological Diagnosis via High Definition Tractography Asymmetry Screening</td>
<td>$88,173</td>
</tr>
<tr>
<td>DSF Charitable Foundation</td>
<td>Robert M. Friedlander</td>
<td>Research on Mitochondria in Neurodegenerative Disease</td>
<td>$30,492</td>
</tr>
<tr>
<td>DSF Charitable Foundation</td>
<td>David O. Okonkwo</td>
<td>Pittsburgh High Definition Fiber Tracking (HDFT) Traumatic Brain Injury TBI Transformative Advancement Plan</td>
<td>$138,465</td>
</tr>
<tr>
<td>Elekta</td>
<td>Hideyuki Kano</td>
<td>Long-Term Prospective Outcome Research for Gamma Knife Radiosurgery in Patients with AVM, Primary or Metastatic Brain Tumors</td>
<td>$35,967</td>
</tr>
<tr>
<td>Genentech</td>
<td>Ajay Niranjan</td>
<td>Multicenter Phase II Study of Border Zone Stereotactic with Bevacizumab</td>
<td>$58,770</td>
</tr>
<tr>
<td>Gifts</td>
<td>Robert M. Friedlander</td>
<td>John McCormick ALS</td>
<td>$20,000</td>
</tr>
<tr>
<td>Source</td>
<td>Investigator</td>
<td>Title</td>
<td>Total Budget Award</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Humanscale</td>
<td>Jeffrey Balzer</td>
<td>Effects of using the human scale float or quickstand on blood pressure, arterial stiffness and cerebrovascular bio</td>
<td>$316</td>
</tr>
<tr>
<td>Lahey Clinic</td>
<td>Adam Kanter</td>
<td>Cervical Spondylotic Myelopathy Surgical Trial (CSM-S Trial): Cost Reimbursable</td>
<td>$31,188</td>
</tr>
<tr>
<td>Lahey Clinic</td>
<td>Adam Kanter</td>
<td>Cervical Spondylotic Myelopathy Surgical Trial (CSM-S Trial): Randomized (PCORI)</td>
<td>$66,290</td>
</tr>
<tr>
<td>Lahey Clinic</td>
<td>Adam Kanter</td>
<td>Cervical Spondylotic Myelopathy Surgical Trial (CSM-S Trial): Non-Randomized (STUART)</td>
<td>$1,499</td>
</tr>
<tr>
<td>Nati Alliance Res Schizophren</td>
<td>R. Mark Richardson</td>
<td>Magnetoeencephalography-based evaluation of motivational processing in patients undergoing deep brain stimulation</td>
<td>$37,869</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Nduka Amankulor</td>
<td>Enhanced GBM Therapy Using a New Class of HSV Oncolytic Vector</td>
<td>$100,646</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Retinal imaging markers of cognition in middle-aged adults with Type 1 Diabetes (Nursing sub w/ Dr. Rosano)</td>
<td>$11,314</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Mechanism Linking Hot Flashes to Cardiovascular Risk</td>
<td>$18,174</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Interdisciplinary Mentoring and Research in Womens Cardiovascular Health</td>
<td>$33,025</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Omega-3, isoﬂavones &amp; amyloid deposition in cognitively normal elderly Japanese (WPIC Sub w/ Akira Sekikawa)</td>
<td>$7,858</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Menopausal Vasomotor Symptoms as a Marker of Brain Aging</td>
<td>$7,705</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Yue-Fang Chang</td>
<td>Imaging pathophysiology in aging and neurodegeneration</td>
<td>$12,775</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>C. Edward Dixon</td>
<td>Alpha-Synclein and Synaptic Vesicle Dysfunction after Traumatic Brain Injury</td>
<td>$314,761</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>C. Edward Dixon</td>
<td>Optimizing Environmental Enrichment to Model Preclinical Neurorehabilitation</td>
<td>$14,142</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>C. Edward Dixon</td>
<td>SNARE Proteins and TBI</td>
<td>$331,406</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Juan C. Fernandez-Miranda</td>
<td>Language connectivity pathways and neuroplasticity in aphasic stroke patients</td>
<td>$345,710</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Robert M. Friedlander</td>
<td>Developing Goal Directed Perfusion Therapy in SAH Neurocardiac Injury</td>
<td>$37,560</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Robert M. Friedlander</td>
<td>Inhibition of Neural Electrode-mediated Inflammation and Neuronal Cell Death</td>
<td>$101,966</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Neural basis of local and circuit-level spontaneous and task evoked hemodynamic brain activity</td>
<td>$135,243</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Connectomics of Brain Aging and Dementia</td>
<td>$9,018</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Cortical Cells Circuits Connectivity and Cognition in Schizophrenia</td>
<td>$52,235</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Cortical Cells Circuits Connectivity and Cognition in Schizophrenia: Project 5</td>
<td>$20,440</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Inside the social perception network: dynamics, connectivity, and stimulation (Supp)</td>
<td>$148,321</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Auditory attention in first episode psychosis</td>
<td>$20,562</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Avniel Ghuman</td>
<td>Inside the social perception network: dynamics, connectivity, and stimulation</td>
<td>$409,619</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Paola Grandi</td>
<td>Enhanced GBM Therapy Using a New Class of HSV Oncolytic Vector</td>
<td>$202,018</td>
</tr>
<tr>
<td>Source</td>
<td>Investigator</td>
<td>Title</td>
<td>Total Budget Award</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>David O. Okonkwo</td>
<td>Neurological Emergencies Treatment Trial (NETT) Network</td>
<td>$23,478</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>David O. Okonkwo</td>
<td>U10 NEXT Network of Excellence in Neuroscience Clinical Trials</td>
<td>$17,359</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Ian Pollack</td>
<td>Molecular Markers as Predictors of Outcome in Gliomas</td>
<td>$61,898</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Ian Pollack</td>
<td>Peptide Vaccine immunotherapy for children with recurrent low-grade astrocytomas</td>
<td>$187,011</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Ian Pollack</td>
<td>Peptide Vaccine-Based Immunotherapy for Children with Recurrent Ependymomas</td>
<td>$69,773</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Ava Puccio</td>
<td>Transcriptomics in Traumatic Brain Injury: Relationship to Brain Oxygenation and Outcomes</td>
<td>$232,169</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>R. Mark Richardson</td>
<td>Subthalamic and corticosubthalamic coding of speech production</td>
<td>$1,074,078</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Nikkantha Sen</td>
<td>Molecular mechanisms underlying vision impairment after TBI</td>
<td>$129,521</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Nikkantha Sen</td>
<td>Development of therapeutic strategy against TBI based on hydrogen sulfide</td>
<td>$84,602</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Nikkantha Sen</td>
<td>Biomimetic Self-Adhesive Dry EEG Electrodes</td>
<td>$11,686</td>
</tr>
<tr>
<td>National Institutes of Health</td>
<td>Nikkantha Sen</td>
<td>Wearable eButton for Evaluation of Energy Balance with Environmental Context and Behavior</td>
<td>$120,596</td>
</tr>
<tr>
<td>National Institute on Aging</td>
<td>Yue-Fang Chang</td>
<td>The Study of Women’s Health Across the Nation—SWAN V</td>
<td>$31,271</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>Adam Kanter</td>
<td>Human scene processing characterized by computerized by computationally derived scene primitives - CMU</td>
<td>$767</td>
</tr>
<tr>
<td>Neurosurg Res &amp; Ed Fndtn</td>
<td>Paul Gardner</td>
<td>Characterization of Exomic Changes in Primary and Recurrent Clival Chordomas</td>
<td>$2,113</td>
</tr>
<tr>
<td>Nth Amer Gamma Knife Cons</td>
<td>Ajay Niranjan</td>
<td>Multicenter phase II study of border zone stereotactic with bevazicuarnab</td>
<td>$29,103</td>
</tr>
<tr>
<td>NuVasive</td>
<td>Adam Kanter</td>
<td>Comparing Minimally Invasive, Hybrid and Open Surgery for Adult Degenerative Scoliosis-Calculation of MCID, MCED and Incremental Cost Effectiveness Ration</td>
<td>$10,000</td>
</tr>
<tr>
<td>Oncorous</td>
<td>Paola Grandi</td>
<td>In Vitro and in vivo characterization on Oncr-001</td>
<td>$21,280</td>
</tr>
<tr>
<td>One Mind</td>
<td>David O. Okonkwo</td>
<td>One Mind - TRACK II</td>
<td>$12,204</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>Paola Grandi</td>
<td>Enhancing viral oncolysis with vasculostatin gene delivery</td>
<td>$6,909</td>
</tr>
<tr>
<td>Pape Charitable Foundation</td>
<td>Diane Carlisle</td>
<td>Mitochondria dysfunction in ALS as a target for gene therapy</td>
<td>$20,109</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Jeffrey Balzer</td>
<td>Actively Constrained Handheld CPA Neurosurgery: Development of a Rat Sciatic Nerve Tumor Model</td>
<td>$10,000</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Sergei Baranov</td>
<td>Mitochondrial dysfunction during neuronal differentiation in Huntington’s disease</td>
<td>$9,000</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Donald Crammond</td>
<td>Nerve Specific Hydrogel for the repair of Nerve Injury</td>
<td>$1,260</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Johnathan Engh/ Will Newman</td>
<td>Development of animal based model for quantifying iatrogenic subcortical injury</td>
<td>$10,047</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Wendy Fellows-Mayle</td>
<td>Developing exceptional microneurosurgical technical skill.</td>
<td>$594</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Paola Grandi</td>
<td>Armed HSV Oncolytic Vectors (oHSVs) to Enhance Anti-Tumor Responses in Isocitrate Dehydrogenase Mutant (IDHmut) Gliomas</td>
<td>$1,687</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Stephanie Greene</td>
<td>The Use of Transcranial Doppler in the Diagnosis of Hydrocephalus and Associated Conditions</td>
<td>$1,687</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>W. Kim</td>
<td>Efficacy of Decitabine Immunotherapy against IDH Mutant Gliomas in vivo</td>
<td>$24,000</td>
</tr>
</tbody>
</table>
## Research
### Research Grant Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>Investigator</th>
<th>Title</th>
<th>Total Budget Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pittsburgh Foundation</td>
<td>Ajay Niranjan</td>
<td>Can a radioprotectant reduce the risk of radiation vasculopathy?</td>
<td>$6,047</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Ava Puccio</td>
<td>Genome-Wide Association Study of Traumatic Brain Injured Patients</td>
<td>$2,349</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>A. Rao</td>
<td>The role of the glioma microenvironment on natural killer cells and immune escape</td>
<td>$1,687</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>R. Mark Richardson</td>
<td>Encoding of movement inhibition in the human cortex and subthalamic nucleus</td>
<td>$1,460</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>Partha Thirumala</td>
<td>Neuroprotective prophylactic systemic modest hypothermia reduces neuronal injury</td>
<td>$1,047</td>
</tr>
<tr>
<td>Pittsburgh Foundation</td>
<td>S. Yablonska</td>
<td>Role of huntington in modulation of mitochondrial respiratory complexes</td>
<td>$12,000</td>
</tr>
<tr>
<td>St. Jude’s Pediatric Hospital</td>
<td>Ian Pollack</td>
<td>Pediatric Brain Tumor Consortium-Yr18</td>
<td>$29,713</td>
</tr>
<tr>
<td>San Bio</td>
<td>David O. Okonkwo</td>
<td>A Double-Blind, Controlled Phase 2 Study of the Safety and Efficacy of Modified Stem Cells (SB623) in Patients with Chronic Motor Deficit from Traumatic Brain Injury (TBI)</td>
<td>$322,048</td>
</tr>
<tr>
<td>San Bio</td>
<td>R. Mark Richardson</td>
<td>A Double-Blind, Controlled Phase 2 Study of the Safety and Efficacy of Modified Stem Cells (SB512) in Patients with Chronic Motor Deficit from Traumatic Brain Injury (TBI)</td>
<td>$3,249</td>
</tr>
<tr>
<td>Sarcoma</td>
<td>Nduka Amankulor</td>
<td>Targeting the retinoid acid pathway: a new therapeutic strategy for IDH-mutant chondrosarcomas</td>
<td>$747</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>C. Edward Dixon</td>
<td>Operation Brain Trauma Therapy</td>
<td>$22,818</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>ENROLLMENT-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$383</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$767,650</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>ENROLLMENT-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$2,308</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>OPTION 1-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$588,111</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>OPTION 2-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$176,908</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>OPTION 3-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$235,501</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>OPTION 5-HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$235,501</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>Ava Puccio</td>
<td>HDFT Biological Diagnosis of TBI Providing Actionable Clinical Report of Quantified Damage</td>
<td>$5,523</td>
</tr>
<tr>
<td>US Army Medical Research</td>
<td>David O. Okonkwo</td>
<td>TRACK-TBI: Repositories - Transforming Research and Clinical Knowledge in TBI (TRACK-TBI): High Definition Fiber Tracking Neuroimaging, Biospecimen and Data Informatics Repositories</td>
<td>$1,118,588</td>
</tr>
<tr>
<td>Univ California, San Francisco</td>
<td>David O. Okonkwo</td>
<td>TBI Endpoints Development (TED)</td>
<td>$4,889</td>
</tr>
<tr>
<td>Univ California, San Francisco</td>
<td>David O. Okonkwo</td>
<td>TRACK II-Committee (Transforming Research and Clinical Knowledge in TBI)</td>
<td>$24,266</td>
</tr>
<tr>
<td>Univ California, San Francisco</td>
<td>David O. Okonkwo</td>
<td>TRACK II-Clinical (Transforming Research and Clinical Knowledge in TBI)</td>
<td>$148,351</td>
</tr>
<tr>
<td>Univ California, San Francisco</td>
<td>Ava Puccio</td>
<td>TRACK II-Committee (Transforming Research and Clinical Knowledge in TBI)</td>
<td>$6,616</td>
</tr>
<tr>
<td>University of Cincinnati</td>
<td>David O. Okonkwo</td>
<td>SDII - Development and Validation of Spreading Depolorization Monitoring for TBI Management</td>
<td>$83,716</td>
</tr>
</tbody>
</table>
### Research

#### Research Grant Summary

<table>
<thead>
<tr>
<th>Source</th>
<th>Investigator</th>
<th>Title</th>
<th>Total Budget Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univ Pittsburgh Brain Institute</td>
<td>Robert M. Friedlander</td>
<td>Live Like Lou Center for ALS Research (UPBI)</td>
<td>$200,000</td>
</tr>
<tr>
<td>Univ of Pittsburgh Physicians</td>
<td>Robert M. Friedlander</td>
<td>UPP FY17 Acad Award - Richardson, Corticosubthalamic Interactions During Speech Production</td>
<td>$50,000</td>
</tr>
<tr>
<td>University of Texas</td>
<td>David O. Okonkwo</td>
<td>Hypothermia for Patients Requiring Evacuation of Subdural Hematoma</td>
<td>$58,950</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hypothermia for Patients Requiring Evacuation of Subdural Hematoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hypothermia for Patients Requiring Evacuation of Subdural Hematoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a Multicenter, Randomized Clinical Trial (HOPES)</td>
<td></td>
</tr>
<tr>
<td>University of Washington</td>
<td>Mandeep Tamber</td>
<td>Park Reeves Syringomyelia Research Consortium</td>
<td>$154</td>
</tr>
<tr>
<td>University of Washington</td>
<td>Mandeep Tamber</td>
<td>Posterior fossa decompression with or without duraplasty</td>
<td>$15,581</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for Chiari type I Malformation with Syringomyelia: Cost Reimbursable</td>
<td></td>
</tr>
<tr>
<td>Veterans Administration</td>
<td>C. Edward Dixon</td>
<td>Chronic Lithium Therapy for Traumatic Brain Injury</td>
<td>$206,438</td>
</tr>
<tr>
<td>Veterans Administration</td>
<td>C. Edward Dixon</td>
<td>IPA-Agreement (Y.Li): Chronic Lithium Therapy for Traumatic Brain Injury</td>
<td>$39,563</td>
</tr>
<tr>
<td>Voyager</td>
<td>R. Mark Richardson</td>
<td>An Open-Label Safety and Efficacy Study of Escalating Doses of AAV2-hAADC Administered by MRI-Guided Convective Infusion into the Putamen of Participants with Parkinson’s Disease with Fluctuating Responses to Levodopa</td>
<td>$512,114</td>
</tr>
<tr>
<td>Voyager</td>
<td>R. Mark Richardson</td>
<td>PD-1102 An Open-label safety and efficacy study of BY-AADC01 administered by MRI-guided convective infusion using a posterior trajectory into the putamen of participants with Parkinson’s disease with fluctuating responses to levodopa</td>
<td>$227,894</td>
</tr>
</tbody>
</table>
Alumni: Past Residents
Past Residents

Class of 2016
Ali Kooshkabadi, MD  
UPMC Altoona  
620 Howard Avenue  
Altoona, PA 16601

Robert Miller, MD  
New England Neurological Associates  
354 Merrimack Street  
Lawrence, MA 01843

Class of 2015
Kimberly Foster, MD  
University of New Mexico  
Department of Neurological Surgery  
2211 Lomas Blvd, NE  
Barbara and Bill Richardson Pavilion  
Mail Stop Code: MSC10 8000  
Albuquerque, NM 87131

Phillip V. Parry, MD  
David Grant USAF Medical Center  
60th Medical Group  
101 Bodin Circle  
Travis Air Force Base, CA 94535

Paul Richard, MD  
Neuroscience & Spine Associates  
8380 Riverwalk Park Blvd. Suite 320  
Fort Myers, FL 33919

Class of 2014
Christopher Bonfield, MD  
Vanderbilt University Medical Center  
2200 Children's Way  
9222 Doctors' Office Tower  
Nashville TN 37232

Ramesh Grandhi, MD  
Lyerly Neurosurgery  
800 Prudential Drive, Tower B, 11th Floor  
Medical School Building, 102F  
Jacksonville, FL 32207

Class of 2013
Juan Martin, MD  
Methodist HealthCare  
Neurosurgery and Spine  
4423 NW Loop 410, Suite 103  
San Antonio, TX 78229

Edward A. Monaco III, MD, PhD  
Center for Image-Guided Neurosurgery  
University of Pittsburgh  
Department of Neurological Surgery  
200 Lothrop Street, Suite B-400  
Pittsburgh, PA 15213

Matthew Tormenti, MD  
Princeton Brain & Spine  
731 Alexander Road, Suite 200  
Princeton, NJ 08540

Class of 2012
Matthew B. Maserati, MD  
Allegheny Brain & Spine Surgeons  
501 Howard Avenue, Bldg. E-1  
Altoona, PA 16601

Pawel Ochalski, MD  
Lancaster NeuroScience & Spine Associates  
1671 Crooked Oak Drive  
Lancaster, PA 17601

Nestor D. Tomycz, MD  
Allegheny General Hospital  
420 East North Avenue, Suite 302  
Pittsburgh PA 15212

Class of 2011
Hilal Kanaan, MD  
ECU Neurosurgical and Spine Center  
2325 Stantonsburg Road  
Greenville, NC 27834

Dean B. Kostov, MD  
Riverside Medical Group  
Hampton Roads Neurosurgical and Spine Specialists  
12200 Warwick Boulevard, Suite 410  
Newport News, VA 23601

Richard H. Singleton, MD, PhD  
Neurosurgical Associates of Richmond  
10710 Midlothian Turnpike, Suite 138  
Richmond, VA 23235

Class of 2010
Devin Amin, MD, PhD  
Division of Neurosurgery  
Southern Illinois University  
421 North 9th Street  
Springfield, IL 62794-9680
Past Residents

Brian Jankowitz, MD
University of Pittsburgh
Department of Neurological Surgery
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213

Ricky Madhok, MD
NeuroAxis Neurosurgical Associates P.C.
1111 Park Avenue, Suite 1G
New York, NY 10128

Class of 2009
Karl Lozanne, MD
Columbia Neurosurgical Associates
720 Rabon Road
Columbia, SC 29203

Stephen Pirris, MD
St. Vincent’s Spine & Brain Institute
4205 Belfont Road, Suite 1100
Jacksonville, FL 32216

Martina Stippler, MD
Beth Israel Deaconess Medical Center
110 Frances Street, Suite 3B
Boston, MA 02215

Class of 2008
Dave Atteberry, MD
NOVA Health
6101 Summitview Avenue, Suite 200
Yakima, WA 98908

Johnathan Engh, MD
University of Pittsburgh
Department of Neurological Surgery
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213

Paul Gardner, MD
University of Pittsburgh
Department of Neurological Surgery
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213

Class of 2007
Pedro Aguilar, MD
575 Coal Valley Road, Suite 260
Jefferson Hills, PA 15025

Joseph Ong, MD
(Deceased)

Michael C. Kachmann (Sharts), MD
Mayfield Brain and Spine Clinic
3825 Edwards Road, Suite 300
Cincinnati, Ohio 45209

Class of 2006
Anand V. Germanwala, MD
Loyola University Stritch School of Medicine
2160 S. First Avenue/Room 1900
Maywood, IL 60153

Costas G. Hadjipanayis, MD, PhD
Mount Sinai Beth Israel
Phillips Ambulatory Care Center
10 Union Square/5th Floor, Suite 5E
New York, NY 10003

Matthew M. Wetzel, MD
Excella Health Neurosurgery
Medical Commons Two
540 South Street, Suite 304
Greensburg, PA 15601

Class of 2005
Anthony Harris, MD, PhD
MultiCare Neuroscience Center of WA
915 6th Avenue
Tacoma, WA 98405-4682

John Y.K. Lee, MD
Penn Neurological Institute
Pennsylvania Hospital
235 South 8th Street
Philadelphia, PA 19106

Class of 2004
Elad I. Levy, MD
University at Buffalo Neurosurgery
3980 A Sheridan Drive, Suite 200
Amherst, NY 14226

Elizabeth C. Tyler-Kabara, MD, PhD
Children’s Hospital of Pittsburgh of UPMC
One Children’s Hospital Drive
4401 Penn Avenue
Pittsburgh, PA 15224

Richard M. Spiro, MD
Pennsylvania Brain & Spine Institute
Butler Health System
127 Oneida Valley Road, Suite 203
Butler, PA 16001
Past Residents

**Class of 2003**
James P. Burke, MD, PhD  
Allegheny Brain & Spine Surgeons  
501 Howard Avenue, Bldg. E-1  
Altoona, PA 16601

Melvin Field, MD  
Orlando Neurosurgery  
1605 W. Fairbanks Avenue  
Winter Park, FL 32789

Alan M. Scarrow, MD, JD  
Mercy Clinic Neurosurgery  
1229 E. Seminole Street, Suite 220  
Springfield, MO 65804

**Class of 2002**
Katrina S. Firlik, MD  
300 S. Ocean Blvd, Apt 4E  
Palm Beach, FL 33480

Atul K. Patel, MD  
Division of Neurological Surgery  
Alameda County Medical Center  
1411 East 31st  
Oakland, CA 94602

Kevin L. Stevenson, MD  
Piedmont Spine & Orthopedic Center  
4660 Riverside Park Blvd  
Macon, GA, 31210

**Class of 2001**
Todd P. Thompson, MD  
University of Colorado Health  
Boulder Medical Building, Suite 101  
1725 E. Boulder Street  
Colorado Springs, CO 80909

John B. Wahlig, Jr., MD  
Maine Spine Surgery  
195 Fore River Parkway, Suite 440  
Portland, ME 04102

Timothy F. Witham, MD  
The Johns Hopkins Hospital  
Department of Neurosurgery  
600 N. Wolfe Street, Meyer 7-109  
Baltimore, MD 21287

**Class of 2000**
Andrew Firlik, MD  
300 S. Ocean Blvd, Apt 4E  
Palm Beach, FL 33480

David Lowry, MD  
The Brain + Spine Center  
3299 North Wellness Drive  
Building C, Suite 240  
Holland, MI, 49424

Brian Subach, MD  
The Virginia Spine Institute  
1831 Wiehle Avenue, Suite 200  
Reston, VA 20190

**Class of 1999**
Brent Clyde, MD  
3401 South US Hwy 89  
Bountiful, UT, 84010

Mark McLaughlin, MD  
Princeton Brain and Spine Care, LLC  
1205 Langhorne-Newtown Rd/Suite 403  
Langhorne, PA 19047

Peter Gerszten, MD  
University of Pittsburgh  
Department of Neurological Surgery  
200 Lothrop Street, Suite B-400  
Pittsburgh, PA 15213

**Class of 1998**
Eugene A. Bonaroti, MD  
Allegheny Health Network  
Professional Office Building II, Suite 106  
2580 Haymaker Road  
Monroeville PA 15146

Jeffrey Campbell, MD  
DuPont Hospital for Children  
1600 Rockland Road  
Wilmington, DE 19803

Daniel Resnick, MD  
University of Wisconsin, Madison  
Department of Neurosurgery  
600 Highland Avenue, K4/834  
Madison, Wisconsin, 53792
Past Residents

Class of 1997
Christopher Comey, MD
Surgery Center of New England
55 St. George Road, Suite 1
Springfield, MA 01104

Kamal Kalia, MD
New England Neurosurgical Associates
300 Carew Street/Suite 1
Springfield, MA, 01104

Class of 1996
Bruce Pollock, MD
Mayo Clinic
200 First Street SW
Rochester, MN, 55905

Michael Rutigliano, MD
Westmoreland County Community Neurosurgery
425 Frye Farm Road
Greensburg, PA 15601

Class of 1995
Daniel O’Rourke, MD
St. Luke’s University Health Network
701 Ostrum Street, Suite 302
Bethlehem, PA 18015

Peter Miller, MD, PhD
Iredell Health System
774 Hartness Road
Statesville, NC 28677

Paul Grabb, MD
Memorial Hospital for Children
1725 East Boulder, Suite 104
Colorado Springs, CO 80909

Class of 1994
Michael Horowitz, MD
Pennsylvania Brain & Spine Institute
Butler Health System
127 Oneida Valley Road, Suite 203
Butler, PA 16001

Walter Langheinrich, MD
Beacon Health System
100 Navarre Place, Suite 6600
South Bend, IN 46601

Gregory J. Przybylski, MD
New Jersey Neuroscience Institute
65 James Street
Edison, NJ 08820

Class of 1993
Mark Linskey, MD
University of California, Irvine
333 City Boulevard West
8th Floor, Suite 810
Irvine, CA 92868

B. Gregory Thompson, Jr., MD
University of Michigan/Taubman HCC
1500 E. Medical Center, SPC 5338
Ann Arbor, MI 48109

Class of 1992
David Oliver-Smith, MD
Heritage Valley Health System
420 East North Avenue, Suite 302
Pittsburgh, PA 15212

Erick Stephanian, MD
477 E. Trailwood Drive
Terre Haute, IN 47802-9606

Class of 1991
Eric Altschuler, MD
Allegheny Health Network
575 Coal Valley Road, Suite 260
Jefferson Hills, PA 15205

Ian Pollack, MD
Children’s Hospital of Pittsburgh
One Children’s Hospital Drive
4401 Penn Avenue
Pittsburgh, PA 15224

Class of 1990
David Engle, MD
Maui Memorial Medical Center
221 Mahalani Street
Wailuku, HI 96793

Walter Hall, MD, MBA
Upstate University Hospital
750 E. Adams Street
Syracuse, NY 13210
Past Residents

**Class of 1989**
Mark Dias, MD  
Penn State Medical School  
30 Hope Drive, Suite 2200  
Hershey, PA 17033

Robert Freidman, MD  
Piedmont Healthcare  
South Atlanta Neurosurgery  
900 Eagles Landing Parkway  
Stockbridge, GA 30281

Hae-Dong Jho, MD, PhD  
Allegheny General Hospital  
420 East North Avenue, Suite 302  
Pittsburgh, PA 15212

Donald Marion, MD  
Defense and Veterans Brain Injury Center  
1335 East-West Highway, Suite 6-100  
Silver Spring, MD 20910

**Class of 1988**
Michael Goodman, MD  
Catawba Neurosurgery Associates  
200 S. Herlong Avenue, Suite B  
Rock Hill, SC 29732

Frank Vertosick Jr., MD  
380 W. Chestnut Street  
Washington, PA 15301

**Class of 1987**
Bruce Cook, MD  
New England Neurological Associates  
354 Merimack Street, Suite 1  
Lawrence, MA 01843

**Class of 1986**
Rob Parrish, MD  
Houston Methodist  
6565 Fannin Street  
Houston, TX 77030

Kenneth Casey, MD  
Beaumont Health System  
18025 Fort Street  
Riverview, MI 48193

**Class of 1985**
John Bookwalter, III, MD  
Greater Pittsburgh Orthopaedic Associates  
5820 Centre Avenue  
Pittsburgh, PA 15206

**Class of 1984**
James Wilberger, MD  
320 East North Avenue  
Allegheny General Hospital, Suite 208  
Pittsburgh PA 15212

Andrew Goler, MD  
Group Health Perminente  
Neurosurgical Surgery Clinic  
125 16th Avenue E., CSB-3  
Seattle, WA 98112

**Class of 1983**
Mark Lester, MD  
Texas Health Resources  
612 E. Lamar Boulevard  
Arlington, TX 76011

**Class of 1982**
Daniel Bursick, MD  
University of Pittsburgh  
Department of Neurological Surgery  
200 Lothrop Street, Suite B-400  
Pittsburgh, PA 15213

Laligam Sekhar, MD  
University of Washington  
Department of Neurological Surgery  
325 9th Avenue  
Seattle, WA 98104

**Class of 1981**
Parviz Baghai, MD  
Allegheny General Hospital  
420 East North Avenue, Suite 208  
Pittsburgh, PA 15212

Stephen Haines, MD  
University of Minnesota/Neurosurgery  
MMC 96  
420 Delaware Street, SE  
Minneapolis, MN 55455
Past Residents

Class of 1980
Phillip Bechtel, MD
Fort Worth Brain & Spine Institute
1325 Pennsylvania Avenue, Ste. 890
Fort Worth, TX 76104

L. Dade Lunsford, MD
University of Pittsburgh
Department of Neurological Surgery
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213

Class of 1979
Paul Nelson, MD
Penn State Hershey Medical Neuroscience Institute-(SC)
1850 East Park Avenue, Suite 112
State College, PA 16803

Howard Gendell, MD
(Deceased)

Class of 1978
A. Leland Albright, MD
University of Wisconsin Health Center
600 Highland Avenue
Department of Neurosurgery
Madison, Wisconsin, 53792

Tadashi Kudo, MD
Ischicka Neurosurgery Hospital
Kurimatashika 1768-29
Omitama-shi Ibaraki-Ken 311-3434

Class of 1977
Jack McCallum, MD
SW Neurological Surgery Associates PA
800 8th Avenue, Suite #220
Fort Worth, TX 76104

John Phillips, MD
460 15th Avenue S.
Naples, FL 34102-5224

Class of 1976
Munir Abbasy, MD
(Deceased)

Bruce Wilder, MD
Clinical Neurosciences
436 Seventh Avenue, Suite 1050
Pittsburgh, PA, 15219

Class of 1975
Eric Holm, MD
Berks Neurosurgery Associates
606 Museum Road
Reading, PA 19611

Albert Camma
751 Forest Avenue, Suite 202
Zanesville, Ohio, 43701

Class of 1974
Joseph Izzo, MD
136 N. San Mateo Drive
San Mateo, CA 94401

Victor Bazzone, MD
Spinal & Neurological Surgery
15190 Community Road, Suite 300
Gulfport, MS 39503

Class of 1973
Charles Kalko, MD
1833 Oak Tree Road
Edision, NJ 08820

Class of 1972
Paul Zannetti, MD
5226 St. Andrew
Corpus Christi, TX 78413

Robert E. Kaplan, MD

William DeWeese, MD
Neurological Surgery
13801 N. Bruce B. Downs Blvd./Ste. 403
Tampa, FL 33613

Class of 1971
Constantino Amores, MD
Neurosurgical Associates Inc.
415 Morris Street, Suite 400
Charleston, WV 25301-1840

Gary Sapiro, MD
2702 Nix Lake Drive
Jonesboro, AR 72401

Stamatios Stavropoulos, MD
5373 Whittier Boulevard
Los Angeles, CA 90022
Past Residents

Ronald Vincent, MD
P.O. Box 8118
Spokane, WA 99203

Patrick Houston, MD

Class of 1970
Augusto Delerme, MD

Harry Stephens, MD

Class of 1969
Eugene Russo, MD
P.O. Box 8118
Spokane, WA 99203

Class of 1968
Peter Sheptak, MD
University of Pittsburgh
Department of Neurological Surgery
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213

Val Humphreys, MD

Hooshang Kasravi, MD

Class of 1967
Alvin Szojchet, MD

Bertrand Marlier, MD

Class of 1966
Daniel Soriano, MD

Class of 1965
Jerry Brown, MD

Sydney Walker, MD

Class of 1964
Mario Ludmer, MD

John D.H. Johnston, MD

Class of 1963
Rafael Dovarganes, MD
Ayuntamiento #93
Coyoacan, C.P. 04000
Mexico D.F.

Taghy Tirgary, MD

Class of 1962
Joseph Arditti, MD
113 Horsler Dr.
St. John, NB E2M-4B4
Canada

Anthony Gallo, MD

Class of 1961
Paul Renton, MD

Leslie DeLima, MD

Class of 1959
Ernest Reigh, MD

Class of 1958
Robert Brocker, MD
1616 Covington St.
Youngstown, OH 44510

James Davis, MD

Class of 1957
Morris Sanders, MD

Class of 1956
Norman Uddstrom, MD

Class of 1955
Robert L. Baker, Sr., MD
1360 Old Freeport Rd., Ste. 1A
Pittsburgh, PA 15238-4102

Class of 1952
Robert Wright, MD

To update information listed in this section, contact Melissa Lukehart at (412) 647-6777 or lukehartml@upmc.edu. You can also send the information to:

Melissa Lukehart
Department of Neurological Surgery
UPMC Presbyterian
200 Lothrop Street, Suite B-400
Pittsburgh, PA 15213
ATTN: Annual Report Alumni
Donations
(July 1, 2016 through June 30, 2017)

Albright Chair in Childrens Neurosurgery
• $100 - $499:
  United Way of Allegheny County

Brain Cancer Research
• $50,000 - $74,999:
  Mr. & Mrs. James C. Polacheck

• $10,000 - $24,999:
  Brain Cancer Awareness 5K, Limited
  Roger & Brenda Gibson Family Foundation

• $1,000 - $4,999:
  Mr. & Mrs. John Machota
  Emily Ray
  Dr. & Mrs. Stephen C. Schwartz
  Mr. & Mrs. Herbert S. Shear

• $500 - $999:
  Mr. & Mrs. James K. Goldberg
  Mary Lohman
  Ann M. Samler
  Mr. & Mrs. Joel J. Sigal

• $100 - $499:
  Richard A. Abrams
  Mr. & Mrs. Sanford M. Aderson
  Ronald L. Bartosh Jr.
  Mr. & Mrs. Ahmie E. Baum
  Mr. & Mrs. Sanford S. Berman
  Jeffrey Boosman
  David Brody
  Diane Bushmire
  Karen Caskey
  Mr. & Mrs. Richard A. Cohen
  Mr. & Mrs. Mike Davidoff
  Kenneth E. Davidoff
  Christine T. DeMao
  Mr. & Mrs. Artie DeSisto
  Derryc K. Dias & Associates
  Mr. & Mrs. Charles Diulus
  Colleen M. Donoghue
  Dr. & Mrs. Martin E. Eichner
  Lee B. Foster II
  Toby S. Frank
  Adrian Gaudet
  James Hall
  Mr. & Mrs. Richard H. Helfer
  Sharon Higgins
  Deb Hvoodik
  Chris Izbicki
  Joan Kerns
  Mr. & Mrs. Edward J. Kiniry
  Daniel Klazkin
  Dr. & Mrs. Philip Meyers Landau
  Mr. & Mrs. William K. Lieberman
  Christine L. McWilliams
  Virginia Mickitsch
  Angela Pecora
  Mr. & Mrs. Thomas Perry
  Kimberly Roadarmel
  Mr. & Mrs. Reid W. Ruttenberg
  Dr. & Mrs. David R. Shensa
  Mr. & Mrs. John M. Sidoni
  Mr. & Mrs. David Paul Siegel
  Adam Silverblatt
  Stephen Smith
  Dr. & Mrs. Peter Tanzer
  Debby Tendler

• Up to $99:
  Mr. & Mrs. Robert Auray
  Brian Austin
  Heather Baker
  William Barth
  Stacy L. Basar
  Nicole Basile
  Dr. & Mrs. Jonathan L. Beaver
  Fred Berkheimer
  Kari Biehl
  Lance Black
  Kristi Bonacci
  Dennis Boosman
  Dr. & Mrs. Jon Brillman
  Roberta Lebow Brody
  Brooke Bustamante
  Lyndsay Clark
  Mr. & Mrs. James Cohen
  David Coulson
  Marilyn Davidoff
  Paula Dunn
  Michael J. Firda
  Matthew J. Galando
  David M. Ginsberg
  Mr. & Mrs. David A. Glickman
  Jeff Goldfarb, Esquire
  Sally Winston Goldhaber
  Martin E. Goldhaber
  Brandon Goodman
  Michelle Hanlon
  Todd Harry
  Daniel B. Hinchman
  Stacey Hollibaugh
  David Izbicki
Donations
(July 1, 2016 through June 30, 2017)

Jan Jones
Jenny Jones
Dr. & Mrs. Joshua M. Kaplan
Shannon Kellgren
Angela Kendera
Steven Koenig
Catherine Lefik
Brent Little
Kathleen Lutins
Michelle Lyle
James Magers
Joyce Matthews
Tom Michael
Janice Miller
Margaret Ortega
Nettie Parson
Steven Perkins
Tanya Reck
Robyn McGhee
Penny Rose
Mr. & Mrs. Bruce Rosen
Janice G. Rosenberg
Justin Sigal
Mr. & Mrs. Allen Silverberg
Neil Silverblatt
Dr. & Mrs. Edwin S. Silverman
Catherine M. Snyder
Mr. & Mrs. Melvin E. Solomon
Mr. & Mrs. Jay S. Stein
Valerie Suter
Patricia L. Trainer
Mr. & Mrs. Gary Traub
Sarah Valentour Nass
Mr. & Mrs. Irwin B. Wedner
Mr. & Mrs. Robert J. Weis
Crystal Jo Welker
Elizabeth Zappa
Sharon M. Zumbro

Brain Modulation Research Lab
• $100,000 - $249,999:
  Hamot Health Foundation

Brain Trauma Research Fund
• $1,000 - $4,999:
  Regina Venturella

• $100 - $499:
  Joseph B. Crisante
  Julianne Elise Crisante

• Up to $99:
  Alic DeCaria
  Mr. & Mrs. Gerald John
  Julia A. McAvoy
  Lois R. Spence

Center for Image-Guided Neurosurgery
• $100 - $499:
  Michael F. Denny
  Joan Huffman

• Up to $99:
  Michele D. Perpetua

Cerebrovascular Research Fund
• $1,000 - $4,999:
  Yoel Sadovsky, MD

• $100 - $499:
  Mr. & Mrs. Paul A. Baumgratz

Deep Brain Stimulation Research
• $1,000 - $4,999:
  Dr. L. John Hoover

• $100 - $499:
  Carol Johnson Kobak

General Neurosurgery Fund
• $25,000 - $49,999:
  Ladies Hospital Aid Society of Western Pa.

• $5,000 - $9,999:
  Mr. & Mrs. Joel C. Ross

• $1,000 - $4,999:
  Catherine George Adler
  Jeffrey R. Balzer, PhD
  William L. Benson
  Dr. & Mrs. Richard P. Brenner
  Molly & Tom Crooks
  Mr. & Mrs. Thomas R. George
  Edna F. Panbakker

• $500 - $999:
  Rev. Mont Bowser
  Mr. & Mrs. John D. Swisher
  Steven P. Weihrouch

• $100 - $499:
  Cynth D. Amenti
  Christopher J. Bane
Donations
(July 1, 2016 through June 30, 2017)

Lee A. Bastin
Mr. & Mrs. Anthony J. Bianco
Carol A. Blitstein
Eugene P. Bolter
Laura F. Brodbeck
Mildred B. Burch
David & Marilyn Burke
Ada Byler
Mr. & Mrs. Joseph Cambridge
Hugh C. Camp
Ronald S. Carlson
Mr. & Mrs. Joseph A. Caruso Jr.
Amy M. Castleberry
Eugene M. Chlosta
Thomas Colella
David Cornell
James F. Cory Jr.
David B. Dalzell Jr.
Glendean J. Davis
Mr. & Mrs. Christopher Demorest
Nancy L. Depalo
Mr. & Mrs. Weldon C. Doran Jr.
Patricia A. Dorning
Mr. & Mrs. Gary Eiben
Mrs. Joan Evanoff
Mr. & Mrs. Patrick J. Fadden
Dr. & Mrs. Dennis A. Feinberg
Martha M. Finley
Walter G. Freidhoff
Mr. & Mrs. Craig J. Gahr
Philip L. Greenisen
Mr. & Mrs. Joseph A. Hajdu
Olana L. Hedrick-Sheaffer
Dr. Mary Jane Kuffner Hirt
Gwendelyn S. Hughes
Faye A. Junker
Mr. & Mrs. Liam Kenney
Joseph E. Kochman
John R. Kopnickly
Mr. & Mrs. Chester Kos
Mr. & Mrs. James Kovacevich
Mr. & Mrs. Cyrus K. Kump
Mr. & Mrs. Robert W. Kushner
Mr. & Mrs. Michael A. Lopez Sr.
Carol A. McMurray
Nancy R. Mead
John H. Moorhead
Bob J. Morgan
Mr. & Mrs. Konda B. Mouli
Chris A. Muhr
Mr. & Mrs. Tip Nunn
Rosemary O’Sullivan
Mr. & Mrs. Joseph C. Paparone II
David M. Patt
Thomas Plant
Bernard N. Rothman
Ralph P. Rusnic
Stephen Sakumoto
Mr. & Mrs. Kenneth Sassaman
James E. Shields
Mr. & Mrs. Gene & Therese Solomon
G. Thomas Sorbera
Alfred H. Speers
Richard L. Spickard
Mr. & Mrs. Earl E. Staton
Elizabeth C. Stumpf
Dick & Ginny Thornburgh
Coralene Torres
Mr. & Mrs. Thomas L. Ulmer
Jean Vanderhoff
Robert M. Vannone
Alice C. Young
Sharon M. Zinn
Judith A. Zsiros

• Up to $99:
Mr. & Mrs. Gary Abraham
Hilecrest Angus
Karen L. Archibald
Mr. & Mrs. Shank R. Balajee
John P. Banks
Helen L. Bauman
Leon M. Bernstein, MD
Elmer G. Bowman Jr.
Vivian Brice
Andrew A. Bruno
Paul U. Bulgarelli, DO
Jean Campbell
Sara E. Coban
Mr. & Mrs. Russell D. Cook
Mr. & Mrs. William L. Cox
Gina M. Diana
LaVerne H. Dobos
Valeria C. Dukelow
Sheldon E. Ehret
Bernard R. Elliott
Darhl W. Empfield Sr.
Barbara L. Esposito
Constance J. Fagan
Juanita Frampton
Samuel M. Galvach
Carol Grieshaber
Dorothy L. Gudukas
Robert M. Hagan
Donations
(July 1, 2016 through June 30, 2017)

Robert D. Harrison
Mr. & Mrs. Daniel J. Harshbarger
Andra Hart
Mr. & Mrs. James W. Hazi Sr.
Daniel A. Howe
Rev. S. Cyril Hurnyak
Barbara A. Intrieri
Mr. & Mrs. Henry Janer
Barbara A. Jenks
Barbara C. Jewell
Bernice E. Julian
Mr. & Mrs. Michael Karas
Ellen Mae Kaye
Mr. & Mrs. Edward S. Kazmirski
Mr. & Mrs. Howard D. Kerr
Maureen R. Killoran
JoAnn King
Mr. & Mrs. Matthew C. Kostelnik
Mr. & Mrs. Robert P. Kretow
Diana M. Kukic
Thomas E. Kuzemchak
Helen M. Lancaster
Lela Leonard
Mr. & Mrs. William H. Linton Jr.
Mr. & Mrs. Frank L. Luisi
Mr. & Mrs. Jack G. Lunney
David S. Marino
Dante Martin
Stephen J. McGeady
JoAnne McMurtry
Joan K. Megrey-Haertjens
Ronald J. Merone
Justin R. Meyer
Pamela Miller
Barbara J. Myers
Donald F. Neville
Catherine M. Nocera
Mr. & Mrs. John Prilla
Frances L. Quadri
Mr. & Mrs. John F. Rankin
Ronald W. Rau
James B. Reilly Jr.
Verna D. Rhodes
Yvonne D. Rine
Nick Rinier
Susan Roll
Mr. & Mrs. Edward Rosenthal
Stephen R. Rujak
Donna M. Sayles
James Sgroi
Lewis K. Shafer
William J. Shortencarrier

Rita W. Sieczkowski
Mr. & Mrs. Todd R. Siegel
Richard J. Siple
Rita Sommer
Bobb M. Stevens
Carolyn I. Strausbaugh
Gloria M. Sweeney
Ellen T. Tracy
Thomas H. Uber
Elaine Varmecky
Dennis J. Vikartosky
Phyllis M. Walter
Earl R. Ward
Barbara Weaver
Patricia L. White
Warren R. Wolf
David F. Yasko
Margaret A. Zacherl
Dr. & Mrs. Andrew S. Zarchy
Janet W. Zimmerman

Dr. Peter J. Jannetta Chair
• $500 - $999:
  Paul B. Nelson, MD

Endovascular Gift Fund
• $1,000 - $4,999:
  Dr. & Mrs. Robert C. Morgan
  Mr. & Mrs. Stephen W. Verderber

• $100 - $499:
  Jeffrey M. Hardy
  Thomas R. Parks
  Kenneth R. Pizzica Jr.

• Up to $99:
  Robert A. Petty
  Mr. & Mrs. Shane Walters

Jannetta Neurological Surgery Fund
• $5,000 - $9,999:
  Fort Pitt Capital Group

• $1,000 - $4,999:
  Stryker Craniomaxillofacial

L. Dade Lunsford Fund
• $5,000 - $9,999:
  Valerie J. Stabile
Donations
(July 1, 2016 through June 30, 2017)

$1,000 - $4,999:
- Dr. & Mrs. Richard W. Hertzberg
- Dr. & Mrs. Douglas S. Kondziolka
- Mr. & Mrs. Jonathan S. Raclin
- Timothy F. Witham, MD

$100 - $499:
- Denver R. Roopchand

Maroon Income Fund - Heindl Fund
$5,000 - $9,999:
- Mr. & Mrs. Carl L. Campbell

The John McCormick Research Fund
$25,000 - $49,999:
- Barbara McCormick

Microvascular and Cranial Nerve Research
$100,000 - $249,999:
- The Jannetta Neuroscience Foundation, Inc.

$10,000 - $24,999:
- Mr. & Mrs. David Meyers
- Sam Sutphin

$5,000 - $9,999:
- Mr. & Mrs. John F. Chizmar
- Mark H. Erwin

$1,000 - $4,999:
- Robert J. Deegan
- Stephen D. Edelman
- James Jancik
- Richard J. Van Allan, MD

$500 - $999:
- John A. Allendorfer
- Richard G. Evelyn
- Channing Jones

$100 - $499:
- Danielle Fade
- William D. Tettelbach
- Cathy R. Zamba

MINC Research & Education Endowed Fund
$1,000 - $4,999:
- Dr. & Mrs. William L. Graham

Neurosurgery Fellow Fund
$1,000 - $4,999:
- Synthes USA

Neurosurgery Telemedicine Fund
$100 - $499:
- Mary Lou S. McLaughlin

Neurosurgical Endowment Fund
$1,000 - $4,999:
- United Way of Allegheny County

Sheptak Chair in Neurological Surgery
$5,000 - $9,999:
- Dr. & Mrs. Peter E. Sheptak

Skull Base Surgery Fund
$1,000 - $4,999:
- Philip R. Fine, PhD

Spine Research Fund
$10,000 - $24,999:
- Delmont R. Sunderland

Neurosurgery Faculty
$1,000 - $4,999:
- The Leigh Tison Charitable Trust
For more information on the Department of Neurological Surgery...

Website
neurosurgery.pitt.edu

Facebook
facebook.com/pitt.neurosurgery

You Tube
youtube.com/neuroPitt

Newsletter
All issues of our newsletter, University of Pittsburgh Neurosurgery News, can be found on our website.

Recently Published Journal Articles
neurosurgery.pitt.edu/recently-published

Faculty/Residents In The Media
neurosurgery.pitt.edu/in-the-news
Department of Neurological Surgery
UPMC Presbyterian • 200 Lothrop Street • Suite B-400 • Pittsburgh, PA 15213
Telephone: (412) 647-3685 • Fax: (412) 647-0989
www.neurosurgery.pitt.edu • neuroinfo@upmc.edu • facebook.com/pitt.neurosurgery

Robert M. Friedlander, MD
Chairman and Walter E. Dandy Professor of Neurological Surgery
University of Pittsburgh School of Medicine