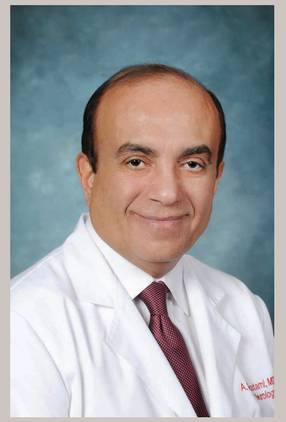

Jefferson
Thomas Jefferson University
HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

# Residency Training in Neurology


# NEUROLOGY at Jefferson

While Jefferson's Vickie and Jack Farber Institute for Neuroscience was founded in 2002, Neurology has had a long tradition at Sidney Kimmel Medical College at Thomas Jefferson University, going back to at least 1831. Student lectures on nervous diseases were provided by a number of individuals over the years; these included John K. Mitchell, MD, James A. Meigs, MD and Robert Bartholow, MD; the latter was elected President of the American Neurological Association in 1881. In 1892 Francis X. Dercum, MD, was appointed Clinical Professor of Nervous Diseases and, in 1900, Professor of Nervous and Mental Diseases. Dr. Dercum, elected President of the American Neurological Association in 1886, worked closely with pioneer neurosurgeons of the day, personified by W.W. Keen, MD, a close associate of S. Weir Mitchell, MD, himself an 1852 graduate of Jefferson and widely regarded as the father of American neurology. Dr. Dercum was followed as Chair by Edward Strecker, MD, and ultimately in 1938 by Bernard Alpers, MD, a leading clinician, educator and neuropathologist of international renown during the middle years of the 20th century. Among faculty members at that time was Francis M. Forster, MD, one of the founders of the American Academy of Neurology (1949). In 1940, neurology at Jefferson was split off from psychiatry as an independent department and has continued to flourish since under a series of leaders, culminating with the appointment of A.M. Rostami, MD, PhD as Chair in 2003.



## Message from the Chairman

Dear Residency Candidate,

Welcome! It is a pleasure to provide information devoted to neurology residency training at Thomas Jefferson University Hospital. Neurology at Jefferson has a long tradition of excellence in clinical training and care. Additionally, we are committed to providing an active and exciting research program, exemplified by the Vickie and Jack Farber Institute for Neuroscience, established in the spring of 2002. Consolidation of our academic and research base with the neurology ambulatory care facility at the Jefferson Hospital for Neuroscience underscores the continuing evolution of the Neurology Department and of its many functions, including our fully approved residency program.

The entire Neurology faculty joins me in expressing appreciation for your interest in our program. Feel free to contact us with any specific questions.

Sincerely,

**A.M. Rostami, MD, PhD**
*Chairman and Professor*

## Letter from the Program Directors



Welcome and thank you for your interest in the residency training program in the Department of Neurology at Thomas Jefferson University Hospital. The chairman, faculty, staff and we are uniformly committed to excellence in education, research and patient care.

Neurology at Jefferson has a long and esteemed history. Founded in 1824, Jefferson is proud to have the first division of Neurology established in the United States. The Department provides a broad educational experience that promotes clinical and research strengths in many subspecialty areas. In the past 12 years the Department has experienced unprecedented growth, resulting in enhanced educational opportunities for both residents and fellows. Jefferson is proud of its Centers of Excellence in Epilepsy, Headache, Stroke, Multiple Sclerosis, Parkinson's disease, Dementia with Lewy Bodies and ALS.

Residents receive a thorough experience in inpatient and outpatient Neurology during their residency training. We are fortunate to have subspecialty exposure to all sub-specialties in neurology. Research opportunities, both clinical and basic science, are tailored to the individual resident and enhanced by ongoing relationships with faculty mentors.

Jefferson graduates become expert clinicians with a strong foundation in research. They become lifelong participants in the tradition of excellence that Jefferson promotes.

We look forward to seeing you.

Jeffrey B. Ratliff, MD
*Director, Neurology Residency Program*

Christopher T. Skidmore, MD
*Associate Director, Neurology Residency Program*
*Vice Chair, Clinical Affairs*

*Ericka Wong, MD*
*Associate Director, Neurology Residency Program*


# APPLICATION **Guidelines**

Ten (10) categorical positions for adult neurology residency training are offered each year.

Our four-year program includes one year in the department of Internal Medicine at Thomas Jefferson University Hospital followed by three years in our neurology residency program.

Appointments to all positions will be made through the Electronic Residency Application Service (ERAS).

Interviews are by invitation only and will be scheduled beginning in October and going through January. Interviews will be scheduled with members of the Residency Selection Committee as well as other faculty members. Applicants will receive a tour of the facilities during their visit.

# Clinical Facilities

Hospitals in Jefferson Health utilized in the residency program include Thomas Jefferson University Hospital, Jefferson Hospital for Neuroscience, Jefferson Methodist Hospital and Nemours Children's Health. Neurology residents participate actively in both inpatient and outpatient activities within this University campus setting.

**Thomas Jefferson University Hospital (TJUH)**
Thomas Jefferson University Hospital is a 926-licensed-bed hospital in Center City Philadelphia. Neuroscience beds include a 14-bed Neuro-intensive Care Unit, 18-bed Intermediate Neuro-intensive Care Unit, 8-bed Epilepsy Monitoring Unit and inpatient general neurology service.

**Jefferson Hospital for Neuroscience**
Jefferson Hospital for Neuroscience is dedicated to neurological and neurosurgical patient care and research. This facility supports a 26-bed Neuro-intensive Care Unit, 20-bed Intermediate Neuro-intensive Care Unit and a 15-bed Stroke Unit.

**Jefferson Methodist Hospital**
Dedicated 15-bed in-patient headache unit for the multidisciplinary care of complex headache patients.

**Nemours Children's Health**
Nemours Children's Health is Thomas Jefferson University Hospital's primary pediatric site and is located in Wilmington, Delaware. It houses active inpatient and consultative services in neurology, as well as active outpatient subspecialty clinics including Epilepsy, Neuromuscular Disease and Headache.

# CLINICAL **Programs**

## Cerebrovascular Disease and Neurocritical Care Center

The Thomas Jefferson University Hospital Cerebrovascular Disease Center strives to improve the outcomes for all stroke patients. The Center offers an integrated approach to the evaluation and management of patients with an acute stroke, utilizing a designated 15-bed Stroke Unit with specially trained nurses and ancillary personnel.

Interventional therapeutic techniques are utilized as required. Numerous investigational clinical trials are ongoing. The Center sponsors community outreach programs for stroke awareness and risk factor modification. The Jefferson Neuroscience Network currently operates stroke telemedicine robots at community hospitals in the region.

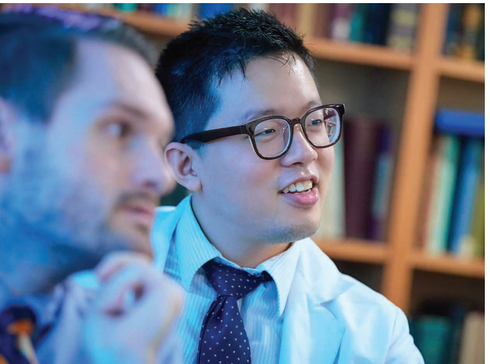
Thomas Jefferson University Hospital and Jefferson Hospital for Neuroscience has one of the largest Neurocritical Care programs in the country. In this environment, residents and NICU fellows learn to become leaders in the academic field of stroke and Neurocritical care. This is a comprehensive approach to caring for the critical patient whose neurological diseases may include intracranial vascular disease, intracranial tumor, spinal cord injury, CNS vasculitis, acute inflammatory demyelinating polyneuropathy, status epilepticus, myasthenia gravis, brain abscess and encephalitis.

## Jefferson Headache Center

The Jefferson Headache Center is a tertiary referral facility that utilizes a comprehensive approach to the diagnosis and treatment of patients with severe, refractory headache. The Center is actively involved in many clinical and pre-clinical research programs, involving conventional and investigational pharmaceuticals used for the treatment and prevention of various headache disorders. The Center is a teaching facility that offers trainees high-quality educational programs in all aspects of the field of headache medicine.


## Jefferson Comprehensive Epilepsy Center

The Jefferson Comprehensive Epilepsy Center is a tertiary care referral center that provides routine care for children and adults and provides specialty care for refractory patients with epilepsy. The Epilepsy Center's multidisciplinary staff includes neurologists, neuropsychologists, neurosurgeons, neuroradiologist, epilepsy fellows and many research and support staff. It houses one of the country's largest epilepsy surgical programs, outpatient treatment facility and inpatient epilepsy services. Genetic counseling, treatment for pregnant women, investigational drug therapy, neuropsychological evaluation, cognitive remediation, ketogenic diet therapy, neurostimulation and diagnosis and care of patients with pseudoseizures are all encompassed within the Center's programs. Supporting the Center's activities are an advanced neurophysiology laboratory and a dedicated 8-bed inpatient Video-EEG-monitoring Unit. Residents and fellows participate in all the Center's epilepsy and clinical neurophysiology basic and clinical research programs.



## Neuro-oncology

The Jefferson Brain Tumor Program comprises a large cooperative group of specialists in neurology, neurosurgery, neuroradiology, radiation oncology and neuropsychology. It is the largest program of its kind in the Philadelphia region and one of the largest on the East Coast. It is devoted to investigating new and evolving therapies and comprehensive management of patients with primary neoplasms of the nervous system as well as those with neurological complications of cancer.

Clinical members of the group cooperate with basic science groups at the Sidney Kimmel Cancer Center at Jefferson on early translational therapeutics. The group is a leader in cooperative group therapies that are developed by national cancer study consortia, many pioneered by Jefferson clinicians.

## Neuromuscular Disease Program

The Neuromuscular Disorders Division of Thomas Jefferson University Hospital offers quality clinical expertise and laboratory studies for the diagnosis and treatment of neuromuscular diseases.

The Neuromuscular Service provides clinical evaluations of patients with neuromuscular diseases, usually in conjunction with their electrophysiological studies. Fellows and residents learn quantitative techniques including nerve conduction studies, repetitive nerve stimulation, needle EMG with quantitative motor unit analysis, and review nerve and muscle biopsies in selected cases.

# RESIDENCY **Curriculum**

The residency training program in Neurology at Thomas Jefferson University Hospital is a fully accredited four-year categorical program, designed to provide comprehensive training in all contemporary aspects of clinical neurology. Progressive responsibilities in patient care and teaching are inherent in the program. Residents will have the opportunity to complete rotations in all sub-specialties in neurology during their 3-year experience. We serve as the primary teaching site for the Sidney Kimmel Medical College at Thomas Jefferson University. Residents have the opportunity to interact with medical students on a regular basis and serve as mentors and educators. All residents are required to complete at least one scholarly activity which could include basic science research, clinical research or quality and safety work.

In addition to general adult clinical neurology, areas covered during training include child neurology, EEG and evoked responses, neuromuscular disorders and EMG, neuroradiology, neuro-ophthalmology, and neuropathology, among others. Intensive exposure to the basic neurosciences is provided, and there is ample opportunity to participate in either clinical or basic research programs.

All residents are provided with junior membership in the American Academy of Neurology (AAN), and individual subscriptions to CONTINUUM, the AAN's comprehensive continuing education program. Residents are encouraged to attend local and major national neurology meetings whenever possible, and are encouraged to present their own research to national audiences.

Additional information about our program may be accessed through our website at **Jefferson.edu/Neurology**.

## Typical Clinical Rotations

| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PGY-2 | University In-patient Service (Ward) Jefferson | | Stroke (Inpatient) TJUH | | Headache (Inpatient) TJUH | Epi-lepsy/ EEG | Multi-specialty (Outpatient) | | Night Float | | Critical Care TJUH | Elective Neuro-radiology |
| PGY-3 | Consults TJUH | | | Child Neurology A.I. duPont | Epilepsy/EEG | | Head-ache | Elective | | | Critical Care JHN | Neuro-ophthalm-ology |
| PGY-4 | Senior Floor Resident | | Multi-Specialty Outpatient | Elective | Child Neurology A.I. duPont | | Psychiatry | Night Float | Elective | Senior Floor Resident | Neuro-pathology | Elective |

## Teaching Conferences

Teaching conferences at Jefferson include weekly conferences, bedside teaching rounds, monthly Journal Club and weekly Neurology Grand Rounds. Currently there are 9 hours of didactic/conference time each week. Over the course of the academic year all areas of neurology are covered. In addition there are weekly multi-disciplinary conferences in epilepsy and stroke. A basic neuroanatomy seminar series is offered throughout the year.

## Resident Salary and Benefits

Salaries are competitive and increase with each post graduate year of training. Benefits available to house staff include medical/prescription, dental and vision services, and life and disability insurance.

- Residents receive an annual stipend for books or meetings
- Paid membership to the American Academy of Neurology is provided
- University recreational facilities are open to house staff
- One month paid vacation for all residents

# Clinical Rotations/Electives

During the PGY-2 year, residents rotate on various inpatient clinical rotations covering general neurology, stroke, headache, epilepsy and NICU. These rotations are completed at Thomas Jefferson University Hospital, Jefferson Hospital for Neuroscience and Methodist Hospital. One month will be devoted to Neuroradiology and 8 weeks to our multi-specialty rotation. In addition residents rotate at Jefferson Methodist Hospital on the Headache Service and on the Stroke Service at Jefferson Hospital for Neuroscience.

During the PGY-3 and PGY-4 years patient care responsibilities and electives are generally divided as follows: 3 months of in-patient consultations; 3 months of pediatric neurology at duPont; 4 weeks of Neuro-intensive Care Unit, and 8 weeks on epilepsy/EEG. Rotations are also provided in EMG/neuromuscular, neuropathology, neuro-ophthalmology, movement disorders, cognitive neurology or in specific electives as arranged by the individual resident. Additionally, all PGY-4 residents will be assigned three months of senior floor resident responsibility.

All residents are scheduled for Outpatient Continuity Clinic one-half day each week for the three years of the residency.

## The Parkinson's Disease and Movement Disorders Program

Patients throughout the tri-state area with Parkinson's disease and related movement disorders are referred to our program for the latest medical and surgical therapies. The Movement Disorders Clinic is a subspecialty clinic staffed by fellowship-trained specialists.

Residents will have a unique opportunity to evaluate and treat patients with a wide range of movement disorders including Parkinson's disease and atypical forms of parkinsonism, dystonia, Huntington's disease, tremors, gait disorders and ataxia. Residents will also gain experience in the use of botulinum toxin for the treatment of dystonia and other focal movement disorders and will help to evaluate patients for deep brain stimulation (DBS) surgery. Regular lectures, phenomenology/video rounds and case discussions supplement the clinical experience.

There are also opportunities for residents to participate in clinical trials and translational research projects in collaboration with the Parkinson's Disease Research Unit and Vickie and Jack Farber Institute for Neuroscience.

## Cognitive Disorders and Comprehensive Alzheimer's Disease Center

The Cognitive Disorders and Comprehensive Alzheimer's Disease Center is a leading regional resource for evaluation of patients seeking high level care for problems involving cognition. This multidisciplinary subspecialty center consists of neurologists, a psychiatrist and neuropsychologists.

Neurology residents have opportunity to be involved in diagnosis and management of these complex patients using a comprehensive approach including high-technology imaging and other biomarker technologies, genetic and neuropsychological characterization and caregiver targeted needs assessments. Our educational experience also includes a series of resident lectures and a monthly CME case conference. We strongly support the development of resident interests in the academic aspects of neurodegenerative diseases involving cognition. As such, we offer ample opportunity for residents to participate in clinical or translational research projects and learn about clinical trials as part of the Vickie and Jack Farber Institute for Neuroscience.

## Multiple Sclerosis Comprehensive Clinical Center

The Comprehensive Multiple Sclerosis Center and the Division of Neuroimmunology utilize an integrated approach to diagnosis and treatment of Multiple Sclerosis and other neuroimmunological disorders. It serves as a tertiary referral and teaching center, staffed by a multi-specialty team of practitioners. It offers special programs for pregnant women and spasticity management. The Center also provides neurological care to residents of Inglis House, which is home to more than 160 individuals chronically ill with MS.

The Center fosters ongoing research into immunology of neurology disorders, new treatment and diagnostic approaches, novel imaging modalities, and outcome and genetic studies in MS. Through the Center, patients have access to clinical trials in all phases of development.

# RESEARCH **at Jefferson**

Research at Thomas Jefferson University Hospital maintains a history of excellence and holds a promising vision for the future. Jefferson Neurology strives to offer new research developments and clinical trials for people with a variety of neurological disorders. We offer a multi-disciplinary team with a research focus in clinical and basic sciences.

Clinical research at Jefferson focuses on epilepsy, stroke, multiple sclerosis, headache and degenerative diseases such as dementia. Each center of excellence is involved in a variety of pharmaceutical-sponsored clinical investigational drug trials. In the laboratory, Jefferson neuroscientists are searching for answers to puzzles that will help us understand the basic mechanisms of disease and lead to treatments and ultimately prevent neurological conditions.

## Multiple Sclerosis Research Center

The Multiple Sclerosis Research Center focuses on the study of Experimental Autoimmune Encephalomyelitis (EAE) as an animal model of Multiple Sclerosis.

Specific research areas include the role of proinflammatory cytokines, such as interleukin-12 (IL-12), IL-23, and their receptors in the patho- genesis of EAE, the mechanisms of intravenous immune tolerance induced by myelin proteins, and the role of the Insulin-like Growth Factor (IGF) in central nervous system remyelination. Another area of research in collaboration with the Department of Radiology is the use of novel imaging modalities for EAE, such as the combined use of high-field magnetic resonance imaging (MRI) and positron emission tomography (PET) to track autoimmune T cells in vivo.

In addition to basic studies of neuroimmunology and neurobiology in EAE, the Multiple Sclerosis Research Center will also conduct immunologic studies in MS patients undergoing conventional and experimental therapies. This is done in collaboration with the Multiple Sclerosis Comprehensive Clinical Center.

## Epilepsy

The Jefferson Comprehensive Epilepsy Center has an internationally recognized research program, with efforts aimed at improving diagnostic methods in epilepsy, exploring new neuro-imaging techniques, developing new treatments for epilepsy, and studying cognition and language disturbances in people with epilepsy. Faculty conduct research projects funded by the National Institutes of Health, private foundations and commercial sponsors. Current research projects include studies of brain stimulation to treat refractory epilepsy, assessment of outcomes after epilepsy surgery, novel imaging techniques using MRI and fMRI to assess brain connectivity and function, 3-D brain imaging, mortality in epilepsy, autonomic function and cardiac rhythm in epilepsy, genetics of epilepsy, investigational drug treatments, pharmacologic and metabolic effects of anticonvulsant drugs, methods to map cortical function with electrical stimulation, cognitive reorganization in epilepsy, language derangements in epilepsy, and mood disturbances in epilepsy.


## Cerebrovascular Disease and Neurocritical Care

The center is involved in clinical trials focusing on the role of agents in neuroprotection during acute strokes. They are also researching risk factors for cerebrovascular disease and modification of risk factors in stroke prevention. Particular interests include controlling intracranial pressure and blood flow.

## Headache

The Jefferson Headache Center is one of the few academic headache centers in the world and has an international reputation as a center for excellence. The center hosts numerous clinical trials in the role of prevention of headaches, the treatment of intractable migraines and the hormonal influences on headache.

## Circadian Rhythms

George C. Brainard, PhD, has directed the Light Research Program for three decades. He studies the effects of light on neuroendocrine physiology and circadian regulation in humans. Using the techniques of photobiology, radio-immunoassay and performance testing, the lab has documented how light influences hormonal balance and behavior. Current studies include elucidation of the action spectrum of melatonin regulation, investigating the phase shifting capacities of light, studying light influences on tumor progression and testing new light treatment devices for seasonal depression.

Research plays a vital role in Jefferson Neurology. Clinicians and basic scientists are actively engaged in advancing the field of neurology.

# **Jefferson** FACTS

Thomas Jefferson University and Jefferson Health comprise an academic medical center whose mission is to educate today's professional students and tomorrow's leaders in a variety of disciplines; discover new treatments and therapies that will define the future of clinical care and provide exceptional primary through complex quaternary care to patients in the communities we serve throughout the Delaware Valley. We have more than 34,500 staff, and are the second largest employer and fifth largest university in Philadelphia.

Jefferson was founded in 1824 as Jefferson Medical College (now known as Sidney Kimmel Medical College) and combined with Philadelphia University on July 1, 2017. Now a comprehensive university, Jefferson includes 10 colleges and 4 schools designed to deliver high-impact education and value for our students in medicine, architecture, business, design, engineering, fashion & textiles, health, science and social science. We enroll more than 8,200 full- and part-time students, have an alumni base of more than 69,500 and are an NCAA Division II college with 17 intercollegiate athletic teams.

Jefferson Health consists of 18 hospitals throughout Philadelphia, Bucks and Montgomery counties in Pennsylvania, as well as, in southern New Jersey. Many of our specialties are ranked among the nation's best by *U.S. News & World Report*, as well as high-performing in many specialty procedures.

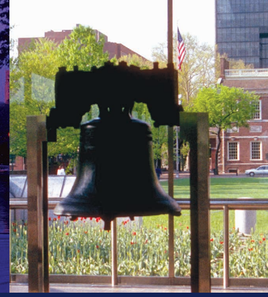
Jefferson Health has more than 4,500 physicians and practitioners, 8,800 nurses and 3,828 licensed beds and has more than 50 urgent care and outpatient locations throughout Philadelphia and suburbs across Philadelphia, Montgomery and Bucks counties, and Camden and Gloucester counties in New Jersey.

Our health system has the largest faculty-based telehealth network in the region. This includes Jefferson Neuroscience Network, which has 37 regional network partners. Jefferson Health also includes the Sidney Kimmel Cancer Center, one of only 70 NCI-designated centers in the country, and the Vickie and Jack Farber Institute for Neuroscience, which includes the Jefferson Hospital for Neuroscience—the only hospital in the region dedicated entirely to neurology and neurosurgery. The Institute brings together the expertise of all our physicians, clinicians and researchers specializing in the diagnosis, treatment and research for stroke and cerebrovascular diseases, brain tumors, epilepsy, Parkinson's disease and other movement disorders, neuromuscular diseases, headaches, Alzheimer's disease and spine and spinal cord injuries.

# FELLOWSHIP
# Opportunities

Our graduating residents have pursued fellowship training in neurology sub-specialties at Jefferson and other leading academic institutions throughout the nation. Fellowships available for post-graduate training at Jefferson itself include:

- Cerebrovascular Disease
- Neurocritical Care
- Clinical Neurophysiology
- Epilepsy
- Headache
- Movement Disorders
- Multiple Sclerosis
- Neuromuscular Disorders



## Philly FACTS

THOMAS JEFFERSON UNIVERSITY AND THOMAS JEFFERSON UNIVERSITY HOSPITALS ARE LOCATED IN HISTORIC DOWNTOWN PHILADELPHIA, IN PROXIMITY TO NUMEROUS EDUCATIONAL, CULTURAL AND RECREATIONAL FACILITIES, AND A SHORT WALK FROM PHILADELPHIA'S EXCITING WATERFRONT. AFFORDABLE HOUSING APPROPRIATE TO RESIDENT NEEDS IS FOUND THROUGHOUT THE CITY AND SURROUNDING COUNTIES. THERE IS EASY ACCESS TO METROPOLITAN NEW YORK AND WASHINGTON, DC, AREAS.

- Attractions include: Independence Hall, National Constitution Center, Philadelphia Museum of Art, Franklin Institute, Philadelphia Zoo, Penn's Landing, Rodin Museum, the Barnes Foundation museum, Valley Forge National Historic Park, Theater district, Lincoln Financial Field, Citizen's Bank Park and the Wells Fargo Center.
- Shopping flourishes in Center City Philadelphia. Jefferson is within walking distance to the heart of the shopping district.
- Jefferson is located minutes from the Philadelphia International Airport, an hour from Atlantic City, NJ, 90 minutes from numerous skiing areas and within a two-hour drive to New York City.
- Philadelphia Sporting Events: Flyers hockey, Eagles football, Phillies baseball, 76ers basketball and Union soccer.

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