



## Pediatric Neurosurgery

DEPARTMENT OF  
NEUROLOGICAL SURGERY  
AT WEILL CORNELL MEDICAL COLLEGE





## AREAS OF EXPERTISE

### > **Brain and Spinal Cord Tumors**

- Image-guided tumor removal
- Minimally invasive endoscopy
- Innovative drug delivery strategies
- Electrophysiology mapping

### > **Disorders of CSF Circulation and Hydrocephalus**

- Endoscopic 3rd ventriculostomy (ETV)
- Endoscopic cyst fenestration
- Programmable shunt valves

### > **Congenital Malformations**

- Microsurgical repair of spina bifida and tethered spinal cord
- Minimally invasive decompression for Chiari malformation
- Multidisciplinary correction of spinal deformity
- Multidisciplinary craniofacial program and cranial reconstruction






### > **Vascular Disorders**

- Microsurgical obliteration of vascular disorders
- Intraoperative angiography
- Minimally invasive endovascular treatment of vascular disorders
- Noninvasive stereotactic radiosurgery for inoperable vascular malformations
- Microsurgical bypass procedures for Moya Moya syndrome
- Interventional treatment for Vein of Galen Malformations

### > **Epilepsy and Functional Disorders**

- Designated Comprehensive Epilepsy Program
- Monitoring unit for seizure localization and brain mapping
- Functional (fMRI) and metabolic (PET/SPECT) imaging
- Vagal nerve stimulation

### > **Spasticity and Functional Disorders**

- Intrathecal drug pumps and rhizotomy for spasticity
  - Gene therapy
  - DBS (deep brain stimulation) for movement disorders
  - Brachial plexus repair
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The surgical care of children with neurological disorders demands a delicate balance between the highly technical practice of neurosurgery and compassionate consideration for children and their families. At the Pediatric Neurosurgery service at the Phyllis and David Komansky Center for Children's Health at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, children are provided world-renowned surgical attention in every area of care. NewYork-Presbyterian Hospital is one of only ten hospitals in the nation listed on the 2009 *U.S. News & World Report* "America's Best Children's Hospitals" Honor Roll and ranks among the top 10 in the area of pediatric neurology and neurosurgery.

### BRAIN AND SPINAL CORD TUMORS

Tumors of the central nervous system are responsible for an increasing number of pediatric cancers. The availability of advanced technologies including image-guided tumor removal, minimally invasive endoscopy, electrophysiology mapping, and innovative drug delivery strategies at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, offer a level of surgical care for children with brain or spinal cord tumors that is unsurpassed. The integration of expert minds in neurosurgery, medical oncology, and radiation therapy at the time of diagnosis offers the best in comprehensive care and ultimately the greatest opportunity for a cure. The unparalleled clinical care from NewYork-Presbyterian Hospital/Weill Cornell Medical Center physicians is matched by a dedicated and internationally acclaimed brain tumor research program investigating novel treatment approaches for children with inoperative brain tumors.

### DISORDERS OF CSF CIRCULATION AND HYDROCEPHALUS

Hydrocephalus (HCP) is a potentially life-threatening abnormal accumulation of CSF in the brain and is the most common ailment treated by pediatric neurosurgeons. Congenital (inborn) and acquired forms of hydrocephalus are treated regularly with a variety of CSF



diversionary procedures that range from conventional shunting to contemporary programmable shunts. Minimally invasive endoscopic surgery, a component of the Minimally Invasive Neurosurgery Center at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, plays an increasingly important therapeutic role through the use of endoscopic third ventriculostomy, septostomy, and cyst fenestration.

## CONGENITAL MALFORMATIONS

Disorders of the developing nervous system commonly require surgical correction. Children diagnosed with Chiari malformation and syringomyelia, one of the most common forms of congenital malformations in children, can expect nearly universal improvement following a safe surgical technique that relies on no artificial substitutes or synthetic implants. Congenital cysts such as arachnoid cysts are being treated with minimally invasive endoscopic surgery to avoid indwelling hardware or large invasive procedures. Children with spina bifida or tethered spinal cord benefit from the safest type of treatment that integrates microsurgery with intraoperative electrophysiologic monitoring.

## CRANIOFACIAL DISORDERS

The Craniofacial Program brings together a team of experts that offer the very best of non-operative and surgical treatment for children with congenital (inborn) or acquired skull abnormalities. Because disorders of the face and skull can involve more than just the child's appearance, systemic evaluation, genetic analysis and familial planning are all available when appropriate. For those children in need of surgical modification and correction, combined pediatric specialists in neurosurgery, plastic and reconstructive surgery, otolaryngology, and anesthesia work in unison. This team safely performs advanced procedures aimed at improving deformities, optimizing functional capacity, and ultimately reducing any social implications.



“We believe no child deserves less than the best treatment for a neurological condition. To provide a cure that lasts a lifetime is our goal.”

— Drs. Mark Souweidane  
and Jeffrey Greenfield

## VASCULAR MALFORMATIONS

Arteriovenous malformations (AVMs) are the most common causes of spontaneous intracranial bleeding in children. The treatment of AVMs and other forms of vascular malformations including aneurysms, cavernous malformations and arteriovenous fistulae integrates the techniques of interventional embolization, neurovascular surgery and stereotactic radiosurgery. Through this approach, physicians at NewYork-Presbyterian/Weill Cornell Medical Center obliterate the vascular malformation most effectively while preserving the child's well being. Microsurgical vascular anastomosis is employed for the treatment of Moya Moya syndrome, a unique childhood vascular disorder. Safe treatment of vascular malformations in newborns such as vein of Galen aneurysms, are now possible through the use of interventional neuroradiology.

## EPILEPSY

The Pediatric Comprehensive Epilepsy Program at the NewYork-Presbyterian Hospital/Weill Cornell Medical Center is staffed by a team of specialized neurologists, neuropsychologists, and neurosurgeons. Because many forms of successful treatment are available for pediatric patients with epilepsy, each specialist has an integral role in tailoring an optimal treatment plan that can be specifically tailored for each child. Inpatient electroencephalographic (EEG) monitoring with video telemetry and detailed cortical mapping are routinely used to precisely define sites of seizure onset and their relationship to important areas of the brain. The program has been instrumental in developing less invasive technologies such as vagal nerve stimulation (VNS) for the treatment of intractable epilepsy.

## NEUROFIBROMATOSIS

A specialized clinic which offers unique services to children with Neurofibromatosis or other neurocutaneous disorders. Patients are given an opportunity to have thorough assessment and implementation of a long-term therapeutic plan.



## SPASTICITY AND FUNCTIONAL DISORDERS

Spasticity is a common manifestation of many different neurologic disorders. Global or focal spasticity can cause significant loss of function and unremitting discomfort. The treatment of spasticity integrates the best available modalities ranging from pharmacologic treatment to surgical therapy. Intrathecal drug pumps and selective rhizotomy are examples of advanced surgical therapy being offered for children with persistent spasticity. Functional or movement disorders are considered for potential therapy through the integration of a world-renowned program in Functional Neurosurgery. The surgical treatment of incurable neurodegenerative disorders has also recently begun using groundbreaking gene therapy approaches.

## FACILITIES

The level of care provided and maintained in Pediatric Neurosurgery is achieved through the support of state-of-the-art facilities designed for children and their families. This child-friendly atmosphere permeates the Phyllis and David Komansky Center for Children's Health. Neurosurgical procedures are conducted with a team of professionals who are all certified in pediatric specialties including a dedicated program in Pediatric Anesthesiology. The environment of the operating room is unrivaled with respect to available technology (stereotactic guidance, endoscopy, intraoperative imaging, cortical mapping, etc.). This technologically advanced arena has been realized in the opening of the Advanced Therapeutic Surgery Center (ATSC), which strives to stay at the forefront of rapidly evolving technology. The 20-bed Pediatric Intensive Care Unit (PICU) and the 45-bed Neonatal Intensive Care Unit (NICU), both with accredited fellowship programs, ensure that children of all of ages receive the very best postoperative recovery and analgesia.



**Mark M. Souweidane, M.D., F.A.A.P., F.A.C.S.** is the Director of Pediatric Neurosurgery and serves as the Vice Chairman in the Department of Neurological Surgery at Weill Cornell Medical College. Dr. Souweidane is a diplomate of the American Board of Neurological Surgery and the American Board of Pediatric Neurological Surgery. He is a fellow of the American College of Surgeons and the American Academy of Pediatrics. He serves on the medical advisory board for the Children's Brain Tumor Foundation and chairs the Neurosurgery Committee of the Children's Oncology Group. He holds joint appointments at Memorial Sloan-Kettering Cancer Center and Hospital for Special Surgery.

**Jeffrey P. Greenfield, M.D., Ph.D.,** has joined the staff of Neurological Surgery at Weill Cornell Medical College. Previously a Chief Resident in the department, Dr. Greenfield completed his undergraduate education at Amherst College before pursuing his M.D. and Ph.D. degrees from the Weill Cornell Medical College and Graduate School of Medical Sciences. He completed his neurosurgery residency at NewYork-Presbyterian Hospital/Weill Cornell Medical Center and Memorial Sloan-Kettering Cancer Center, and a clinical fellowship in pediatric neurosurgery at the Children's Hospital of Philadelphia, one of North America's premier fellowship programs.

## DIRECTIONS TO THE DEPARTMENT OF NEUROLOGICAL SURGERY

**By Car** Coming from FDR North, take the 61st Street exit and make a right turn onto York Avenue. Coming from FDR South, take the 71st Street exit and make a left turn onto York Avenue. The main entrance is located at 525 East 68th Street, directly east of York Avenue.

**Parking** Valet parking is available at the East 68th Street entrance and at garages located on York Avenue between 68th and 70th Streets.

**By Subway** Take the 6 train to the 68th Street/Lexington Avenue Station. Walk four blocks east to York Avenue. The main entrance is located at 525 East 68th Street, directly east of York Avenue.


**By Bus** Via York Avenue, take the M31 to 69th Street. Via 1st Avenue, take the M15 to 67th Street. Walk one block east to York Avenue. The M66 crosstown bus arrives on the corner of 68th Street and York Avenue. The main entrance is located at 525 East 68th Street, east of York Avenue.

**Inside the Building** Once inside the 68th Street entrance, proceed straight until you are in the main lobby and see the Information Desk. Walk past the Desk and straight to the end of the hallway. Take the Starr (ST) elevators to the 6th floor. Room 651 is on your left.

**Overnight Accommodations** are available next door at the Helmsley Tower of NewYork-Presbyterian Hospital 212-472-8400 or at The Bentley 212-644-6000.

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 **NewYork-Presbyterian**  
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