The Surgical Treatment of Epilepsy in Adults and Children

DEPARTMENT OF
NEUROLOGICAL SURGERY
AT WEILL CORNELL MEDICAL COLLEGE

COMMON CAUSES OF EPILEPSY

- *Temporal Lobe Epilepsy* is one of the most common types of epilepsy. Seizures often begin with an "aura" or warning and progress to complex partial seizures. Surgery is extremely effective in eliminating seizures in patients with this type of epilepsy.
- *Gliosis* is a type off scar that can occur in the brain from a prior trauma or stroke. Removal of this area of the brain can often cure epilepsy
- *Low Grade Tumors* are another frequent cause of chronic seizures. Tumors such as gliomas, astrocytomas, or oligodendrogliomas can be surgically removed with a very high rate of seizure control.
- *Cortical Dysplasia* is one of the most common causes of epilepsy in children. These disorders of neuronal migration, such as tuberous sclerosis or hypothalamic hamartomas, can now be detected with sophisticated imaging techniques and removed surgically to help control seizures.
- *Vascular Malformations,* such as cavernous malformations or AVMs (arteriovenous malformations), may also cause epilepsy. Surgery or radiosurgery can be used not only to prevent the risk of bleeding but to control seizures.
- *Trauma,* whether severe or even moderate head trauma, may cause recurrent seizures. If a focal scar on the brain is located, surgical removal of this area can help control seizures.
- *Infections* such as meningitis, encephalitis or Rasmussen's disease may cause epilepsy. Surgical procedures to locate and remove abnormal areas of the brain can have a dramatic impact on seizure frequency and severity.

Individuals with epilepsy may fear that they will have epilepsy for the rest of their lives. They worry that they will never again be able to drive, swim, or go out in public without the fear of having seizures. There is also a known risk of sudden death in patients with epilepsy. The medications that control epilepsy are powerful, can be sedating and can slow one's ability to think. In addition, women on epilepsy medication have an increased risk of birth defects if they have children.

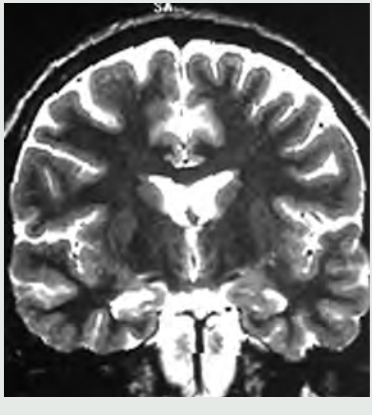
THE GOOD NEWS IS... THERE IS A CURE FOR EPILEPSY!!

What many people do not know is that surgery is a cure for epilepsy. In fact, brain surgery is the only known cure for epilepsy. Unfortunately, many people do not know how effective surgery is at curing epilepsy. In carefully selected patients, as many as 80% can be cured of their seizures after a temporal lobectomy. If epilepsy is associated with a growth in the brain or an abnormal blood vessel, epilepsy can be cured in as many as 95% of patients. Epilepsy caused by developmental abnormalities in the brain, often found in children, can be cured in anywhere from 40-60% of patients depending on whether an MRI scan of the brain can identify an abnormal area. In addition, there is a good chance that even if all seizures do not stop after brain surgery, the seizures will be significantly improved and the surgery will be worthwhile.

OUR PHYSICIANS

Under the leadership of Dr. Theodore Schwartz, the Director of Epilepsy Surgery at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, the Center for Epilepsy Surgery offers the most advanced, state-of-the-art technology for the treatment of epilepsy. All patients undergo a comprehensive work-up prior to surgical evaluation by a team of physicians including epileptologists, neuropsychologists, neuroradiologists and neurophysiologists, all specializing in the treatment of epilepsy. The surgical plan for each patient is determined by a multi-disciplinary team of specialists. For our pediatric patients, Dr. Schwartz works closely with our pediatric neurosurgeons and all operations are performed using a team approach.

At Right: Epileptic regions of the brain can be discovered using MRI scans in preparation for surgery.



TREATMENT OPTIONS

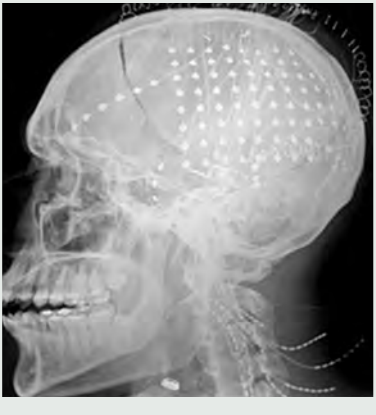
Brain Surgery Removal of abnormal epileptic brain tissue is the most effective method for stopping seizures. Using sophisticated technologies such as functional and anatomic MRI, PET, WADA and even stereotactic implantation of electrodes, our goal is to remove as little tissue as possible, as safely as possible, to eliminate seizures. Detailed brain mapping is performed prior to surgery by our neuropsychologist to ensure that only abnormal tissue is removed. For children with frequent generalized seizures or "drop attacks" we offer a corpus callostomy, or the "split-brain" operation. In extreme situations, such as Rasmussen's Encephalitis or hemimegalancephaly, a functional hemispherectomy may be necessary.

Vagal Nerve Stimulator (VNS) If the focal region of a seizure onset cannot be found, placing a VNS is another effective way to reduce seizure frequency and severity. The VNS consists of a small generator, implanted underneath the clavicle, attached to a set of electrodes wrapped around a nerve in the neck. Intermittent stimulation of this nerve has been shown to effectively reduce the frequency and severity of seizures. Implantation of a VNS is less risky than brain surgery but the chance of a cure is much lower.

Weill Cornell Medical College has been a leading center in the development of the VNS and we can determine which patients are best served by this treatment.

Gamma Knife Radiosurgery Stereotactic radiosurgery is a novel therapy for epilepsy. Radiosurgery involves a single high dose treatment, which does not involve an incision. It is an effective alternative for treating epilepsy arising from the temporal lobe, hypothalamic hamartomas or arteriovenous malformations when surgery is felt to be too risky. Ask your physician if you are a candidate for this minimally invasive therapy.

Innovative Therapies The Epilepsy Center at Weill Cornell Medical College is constantly examining novel therapies to treat patients with epilepsy. We are currently investigating the use of several techniques including deep brain stimulation, cortical stimulation and optical imaging. Please ask your physician if you might be eligible to enroll in one of these or other exciting clinical trials.



Left: In some cases, electrodes must be implanted on the surface of the brain to record the location of the seizures.

EPILEPSY SURGERY IN CHILDREN

In children with epilepsy the surgical goals of the treatment we offer may be different than in the adult patients we evaluate depending on your child's epilepsy syndrome, the frequency and severity of seizures and the age of your child. While an adult with seizures may aim for independent living, the goals for a child include meeting developmental milestones, improving their ability to learn, and basic behavioral progression.

Dr. Greenfield, who specializes in pediatric epilepsy neurosurgery, works in concert with Dr. Schwartz to provide the best epilepsy care for children who need surgery. In addition to the two surgeons, children are evaluated by a comprehensive team of specialists, including neurologists, social workers, nurse practitioners, and rehabilitation doctors. Together, we review the specific details of your child's case to tailor a treatment plan to meet the collective goals of the child. When appropriate we explain all of the treatment options to your child with age-appropriate information that they can understand. This reduces anxiety and increases their cooperation and feeling of control over the situation.

Surgery is only one part of epilepsy treatment. Seizure control is the first step in managing epilepsy, but not the end. Once seizures are well-controlled, children with epilepsy may still experience difficulties with self-esteem, learning, behavior, or social adjustment. Our multi-disciplinary team continues to work with children well after surgery to address these ongoing issues.

PARTNERSHIP WITH PATIENTS

Our patients are true partners with their physicians. Our neurosurgeons and medical care team take as much time as necessary to help our patients and their families understand every aspect of their care. We will answer all questions pertaining to diagnostic and surgical procedures, explain the relative risks and benefits of medical options, and help our patients understand what to expect both during and after surgery. We stay in touch with our patients long after they have returned home, monitoring their condition, providing medical assistance, and helping them maintain the highest possible quality of life.

Dr. Schwartz utilizes the most advanced, state-of-the-art operative equipment available to remove the epileptic focus with the utmost precision.

Theodore H. Schwartz, M.D., received his undergraduate and medical degrees from Harvard University where he graduated Magna Cum Laude. After his residency and chief residency in Neurosurgery at The Neurological Institute of New York at Columbia-Presbyterian Medical Center, Dr. Schwartz completed advanced fellowship training at Yale-New Haven Medical Center in the surgical treatment of epilepsy and brain tumors. Dr. Schwartz specializes in image-guided minimally invasive surgical techniques such as stereotaxis, endoscopy and microsurgery and has received numerous awards and fellowships. Dr. Schwartz is Director of Epilepsy Surgery at NewYork-Presbyterian/Weill Cornell Medical Center.

Jeffrey P. Greenfield M.D., Ph.D. specializes in pediatric neurosurgery. He obtained his M.D. and Ph.D. from the Weill Cornell Medical College and Graduate School of Medical Sciences and served as Chief Resident in the Department of Neurological Surgery at NewYork-Presbyterian/Weill Cornell Medical Center. He completed his neurosurgery residency at NewYork-Presbyterian/Weill Cornell Medical Center and Memorial Sloan-Kettering Cancer Center, as well as 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.

Department of Neurological Surgery
Weill Cornell Medical College
Starr Building, Room 651
525 East 68th Street, Box 99
New York, New York 10065

24-hour Toll-Free Number:
1-866-4CNS-SURG (1-866-426-7787)
Website: www.cornellneurosurgery.org

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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