



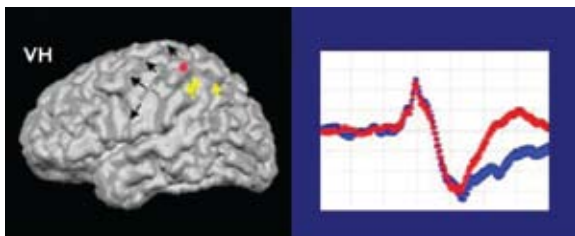
# Weill Cornell Medical College

## Brain and Spine Center

December 2009

### Epilepsy

## Neurology



Evoked potential recorded from implanted intracranial electrodes.

Eighty people per 100,000 in the general population experience a “new onset seizure” each year: approximately 60% will be diagnosed with Epilepsy, or a seizure disorder. Fortunately, anti-epileptic medications will control seizures in more than half of these patients over substantial periods of time; medicines will also reduce the number of seizures in another 30%. That is the good news. The problem, however, is that a third of all epileptic patients do not respond to medications. In such cases, surgical options, approved by the Food and Drug Administration (FDA) deliver an effective solution.

Physicians in The Department of Neurology and Neuroscience at the New York-Presbyterian Hospital/Weill Cornell Medical Center provide expert diagnosis and treatment of epilepsy based on years of experience and with access to precise imaging equipment. Receiving patients from around the world, physicians treat both intractable (hard-to-treat) seizures, as well as epilepsy-related diagnostic and management problems. State-of-the-art, in-hospital video electroencephalographic monitoring (VEEG) incorporates continuous video and EEG stream for the diagnosis of all forms of epilepsy. Ancillary diagnostic testing, such as high-resolution seizure protocol MRI (magnetic resonance imaging), PET scan, and intraoperative EEG, are readily available. Once an accurate diagnosis is pinpointed, medications will be prescribed. If and when it becomes clear that medications fail to provide control of the disease, our physicians collaborate with team members at the center who specialize in neuroradiology, neuropsychology, and neurological surgery.

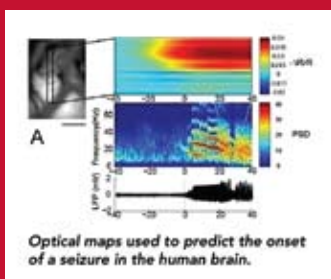
Working with the Department of Neurological surgery, we have been the most active study site in the Northeastern United States for brain neurostimulation as a means to control medication-resistant epilepsy. In the SANTE trial (Stimulation of the Anterior Nucleus of the Thalamus for Epilepsy), a device is placed in the sub-cortical region of the brain to prevent seizures. Colleagues from both departments are working in tandem, and with Medtronic (commercial sponsor), in presenting the results of a five-year trial to the FDA. An FDA decision to approve this novel therapy may be rendered in the near future.

## Neurosurgery

Not always commonly known, surgery is a cure for epilepsy. In fact, brain surgery is the only known cure for epilepsy. It can render a success rate ranging between 80 to 95%. The Department of Neurological Surgery is a leader in the successful treatment of epilepsy receiving patients from around the world who have not achieved success with medications. When medications do not control the seizures, many patients fear they will never lead a normal life-never again be able to drive, participate in sports, or even go out in public. To learn that there are surgical solutions, is welcome knowledge for those struggling with this challenging disease.

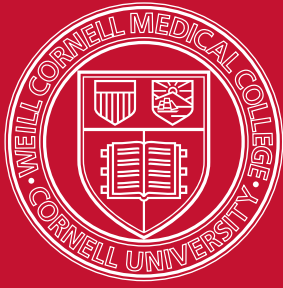
At The Center for Epilepsy, the neurosurgeon formulates a tailored treatment plan for each patient after a comprehensive evaluation is completed by a team of physicians, including epileptologists, neuropsychologists, neuroradiologists and neurophysiologists. (Epilepsy may stem from abnormal tissue in the temporal lobe, a gliosis scar due to previous trauma or stroke, low grade tumors, vascular malformations, and other causes.) Using advanced state-of-the-art technology, one of the following options will be employed: Brain Surgery; Vagal Nerve Stimulator (VNS); Gamma Knife Radiosurgery; and/or Innovative Therapies. Epileptic regions of the brain can be discovered using MRI scans. In some cases electrodes must be implanted on the surface of the brain to record location of the seizures. Technologies such as MRI, PET, WADA, and Stereotactic Implantation of Electrodes facilitate the neurosurgeon in the removal of the epileptic focus in the brain. Resection of this focal point is achieved with the utmost precision, sparing healthy surrounding tissue. Sometimes the focal area cannot be found; in this situation, placing a VNS is another effective way to reduce seizure frequency and severity. It involves a small generator implanted underneath the clavicle, attached to a set of electrodes wrapped around a nerve in the neck. Gamma Knife Radiosurgery involves a single high-dose treatment with no incisions; it is utilized as an effective alternative for epilepsy arising from the temporal lobe when surgery is considered too risky. Community outreach includes public forums where patients have conveyed their experiences living with epilepsy- and the successful outcomes they achieved through surgery.

### Shedding Some Light on Epilepsy



Optical maps used to predict the onset of a seizure in the human brain.

Collaborating with Cornell University, Ithaca, our work is gaining international attention. A current project is helping to develop more advanced optical techniques to manage epilepsy localization and surgery. Computer mapping is underway for the onset and spread of epilepsy using small changes in the reflection of light, a more sensitive approach that may provide additional information not seen with electrodes. A high-energy femtosecond laser system to produce sub-surface laser-guided incisions in the cortex is also in development. These advancements lead to the ability to make small focal cuts in specific layers of the brain-- without damaging its blood vessels or functional capabilities. The team looks to the future, when one day, a “robot-guided” tool could target cuts to a specific layer in the cortex.



# Weill Cornell Medical College

## Brain and Spine Center

### Editorial Board

**Philip E. Stieg, PhD, MD**  
Neurosurgeon-in-Chief  
Department of Neurological Surgery



**Matthew E. Fink, MD**  
Neurologist-in-Chief  
Department of Neurology



**Padmaja Kandula, M.D.**  
Director, Video EEG Monitoring  
(Long term EEG Monitoring)  
Comprehensive Epilepsy Center



**Theodore H. Schwartz, M.D.**  
Director of Epilepsy Surgery



### For more information, contact:

**Amy Sabek**  
Physician Liaison  
Neuroscience Service Line  
Telephone: (212) 746-9819  
Email: ams2008@nyp.org

**Suzanne Ross**  
Medical Editor

## Upcoming CME Activities and Other Events

### ADVANCES IN MULTIPLE SCLEROSIS: WHAT'S ON THE HORIZON - A CELEBRATION OF THE JUDITH JAFFE MULTIPLE SCLEROSIS CENTER

Thursday, December 3, 2009

6:00pm - 8:00pm

Please RSVP at 212-821-0527 or [adr2005@med.cornell.edu](mailto:adr2005@med.cornell.edu)

### INDICATIONS AND CONTROVERSIES OF MINIMALLY INVASIVE SPINE SURGERY: HANDS-ON SYMPOSIUM

December 10-12, 2009 at Weill Cornell Medical College

Register online at [www.cornellneurosurgery.org](http://www.cornellneurosurgery.org)

### MULTIPLE SCLEROSIS MONTHLY LECTURE SERIES

Every 3rd Wednesday of the month

6:00pm - 8:00pm

For more information and to register, visit [www.cornellneurology.org](http://www.cornellneurology.org)

[www.cornellepilepsy.org](http://www.cornellepilepsy.org)

New York, NY 10065

Baker Pavilion 16

525 East 68th Street

New York-Presbyterian Hospital/Weill Cornell Medical Center

Comprehensive Epilepsy Center

To learn more about the services offered at the Comprehensive Epilepsy Center, visit our website at [www.cornellepilepsy.org](http://www.cornellepilepsy.org) or call 212-746-2359.

• State-of-the-art neurophysiologic monitoring is utilized to provide high-quality intraoperative surveillance during neurosurgery and to guide patient treatment and progress in the neonatal and pediatric intensive care units and adult medical and surgical intensive care units.

• Extensive "mapping" of the brain by neurodiagnostic imaging, neuropsychological testing, and other methods of analysis ensures that the neurosurgical approach, if chosen, is a safe and desirable option.

• Approach to the care of these more difficult cases through the use of the most advanced techniques, such as neurosurgical intervention and vagal nerve stimulation.

• When treatment with medication fails to provide control, neurologists, neurophysiologists, and neurosurgeons work together with other team members to evaluate the possibility of surgical treatment of carefully selected intractable seizure disorders.

• Exciting research conducted at the Center involves testing new experimental drugs and devices that help patients with hard-to-manage seizures.

• The Center is certified by the New York Department of Health as qualified to carry out long-term video-EEG

monitoring and epilepsysurgery for patients with intractable epilepsy.

• Provides services to adults and children with intractable

hard-to-treat seizures, as well as those with other epilepsy-

related diagnostic and management problems.

and teaching institutions.

Widely acclaimed for pioneering achievements in research

and clinical innovations, the Comprehensive Epilepsy Center

provides a multidisciplinary approach to the complex medical

and social needs of patients with seizures. An active branch

of the internationally-regarded Neurology and Neuroscience

Department at the New York-Presbyterian Hospital/Weill Cornell

Medical Center, individuals and families receiving care through

the Comprehensive Epilepsy Center have available to them the

vast resources of one of the country's most prestigious medical

and teaching institutions.

## Comprehensive Epilepsy Center

New York, NY 10065

525 E. 68th St., Box 99

Department of Neurosurgery

Weill Cornell Medical Center

New York-Presbyterian

NONPROFIT  
ORGANIZATION  
US POSTAGE  
PAID  
NEW YORK NY  
PERMIT # 3036