

TEAM APPROACH MAKES UCH ONE OF NATION'S BUSIEST DEEP BRAIN STIMULATION CENTERS

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UCH may be one of several institutions in the U.S. that performs science-fiction-sounding “deep brain stimulation” (DBS) procedures, but a unique team approach has made it into one of the most effective and one of the busiest.

Patients suffering from Parkinson’s disease and other movement disorders have benefited for several years from DBS, a procedure that uses electrodes implanted in the brain to stimulate the activity of neurons. The goal: block the abnormal activity of neurons that cause debilitating neuromuscular problems.

Neurosurgeons first performed DBS in France in the late ‘80s. It was first approved in the U.S. in 1997 for the treatment of essential tremor (persistent shaking of the hands and other parts of the body). Approval for the treatment of Parkinson’s disease followed in 2002 and for dystonia (involuntary muscle contractions that cause twisting and other involuntary movements) in 2003.

To perform DBS, surgeons thread 1-millimeter-thick wires with four electrodes attached through a hole drilled in the patient’s cranium. The electrodes are placed in various structures deep in the brain, depending on the disorder. The wires connect to an implanted pulse generator (IPG), which acts like a pacemaker by firing electrical impulses to the targeted spots in the brain.

Patient evaluation is key. The procedure has a proven record, says Julie Berk, MS, PA-C, physician assistant with the Department of Neurosurgery, but it is not appropriate for all patients.

“We have a team of multidisciplinary physicians who evaluate each eligible patient to ensure that only those who are most likely to benefit from surgery are approved.”

The multidisciplinary team consists of:

- Steven Ojemann, MD, neurosurgeon
- Olga Klepitskaya, MD, neurologist
- Brian Hoyt, PhD, neuropsychologist
- Heather Ene, MD, and Victor Chang, MD, physical medicine and rehabilitation
- Neil Weiner, MD, psychiatrist.

The program averages one DBS surgery per week, putting it on the list of the busiest DBS centers in the country. Dr. Ojemann has placed more than 200 DBS



Parkinson’s disease patients control electrical stimulation to the brain using a hand-held monitor.

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implants since beginning his surgical work at UCH in 2004.

Candidates must take a battery of cognitive tests – four to six hours in length – administered by Dr. Hoyt before being approved for surgery.

Berk helps to prepare patients selected for the procedure, evaluating them and telling what to expect. “It’s a big commitment,” she notes. “It involves three surgeries, one on each side of the brain and a third to implant the IPG.”

Long-term patient commitment. The process doesn’t end with the surgeries, Berk adds. Providers see patients for several weeks for “programming,” the process of configuring the electrodes so that they deliver the most effective brain stimulation.

Dr. Klepitskaya, fellowship-trained in movement disorders and DBS at Stanford University, evaluates patients before surgery, and provides support during the operation.

She notes that patients are awake during the procedure, communicating with her and Dr. Ojemann.

“I test the patient’s movement before and after the electrodes are placed.” As the procedure progresses, she says, she and the neurosurgeon “listen to signals coming from the deep structures in the brain. We are trying to find the best areas for stimulation.”

Parkinson’s patients treated with DBS receive electrical stimulation around-the-clock, Dr. Klepitskaya says. They also get a hand-held home device (*see photo*) that allows them to adjust the signal strength up or down and on either side of the brain.

“This can help if the tremors come back,” she remarks, “but patients need training to understand how the device works.”

Klepitskaya stresses the importance of the DBS team’s multidisciplinary approach. “It is very important, for example, that a psychiatrist agreed to work with us. Depression, anxiety and obsessive-compulsive disorder are common in Parkinson’s patients.”

Post-operative physical problems can crop up, Dr. Klepitskaya says. “Physical therapy – both inpatient and outpatient – is important. The body is different after the surgery.”

The team also receives help from a new source, a pair of patients who benefited from DBS treatment for their Parkinson’s disease, Valerie Graham and Kate Kelsall. The pair formed a DBS support group for monthly meetings, then came to UCH on a volunteer basis to help DBS patients. They now function as “family liaisons,” between patients and providers, Dr. Klepitskaya says.

“These two outstanding individuals help to show what distinguishes our program: multidisciplinary comprehensive care that considers every aspect of the disease and individual patient’s life.”