

# TECHNOLOGY TUNED IN

Medtronic DBS Featured in NatGeo  
"Brain Surgery Live" Broadcast

Medtronic

Cleveland, OH – October 26, 2015

An Ohio man underwent brain surgery on live television Sunday night, the first time such a procedure had ever been televised live in the United States. The patient, 49-year-old Greg Grindley, was awake and communicating with doctors in the operating room during much of the six-hour procedure.

Surgeons successfully implanted two thin wires, or leads, into Grindley's brain during the National Geographic broadcast. Doctors hope the deep brain stimulation procedure will help control the tremors from Parkinson's disease that he has endured for 11 years. [See a video of Greg Grindley before his surgery.](#)

Using a 3-D mapping image, neurosurgeon Dr. Jonathan Miller and a team of surgeons and neurologists performed the procedure at University Hospitals Case Medical Center in Cleveland. The 3-D imaging helped the team guide the leads into precise areas of Grindley's brain. Impulses from the leads were expected to block the faulty brain signals that cause his tremors, reducing the involuntary twitches, shaking and jerking movements.

Surgeons turned on the electrical pulses at 9:45 PM CDT and Grindley's tremors subsided immediately. [Watch the video as the system is turned on.](#)

"Wow," Grindley said as he held up hands that had not held steady in a decade. "I never expected this at all." He then used an i-Pad to send a message to his wife and family watching from a nearby room.

Grindley went home the following day. In early November, surgeons will implant a pacemaker-like device that will permanently deliver electrical stimulation to the precisely targeted areas within his brain. After that, it will take additional visits to optimally program the implanted DBS system. The leads and other components of the deep brain stimulation system are made by Medtronic. [How deep brain stimulation works.](#)



Parkinson's patient, Greg Grindley, was awake for much of the six hour surgery. He was able to demonstrate the effect of the procedure for doctors during the operation.

The two-hour live broadcast started two and a half hours into the procedure, and doctors had already implanted one of the leads.

"We got great results," said Dr. Jennifer Sweet, a member of the surgery team who spoke during the broadcast. "Better than we expected, better than we could expect," she said.

Test pulses delivered earlier in the surgery also clearly appeared to work. Grindley's tremors were dramatically reduced.

"Wow," Grindley said after testing of the first electrode. "Thank you so much."

About an hour into the broadcast Grindley laughed while listening to his surgeon talk to National Geographic host Bryant Gumbel.

"I'm glad to hear I have a normal brain," he laughed. [See the clip.](#)

Grindley had just retired from a 20 year career in the Navy when he first began noticing the tremors. He ignored them at first, but they got worse. Drug treatment helped, but eventually became less effective.

Dr. Miller and National Geographic say they hoped the live broadcast would help educate the general public about deep brain stimulation, demystify brain surgery, and help generate interest in further brain research.

Deep brain stimulation is not a cure for Parkinson's, but it has proven effective in controlling tremors and other symptoms of the disease, even though doctors still aren't sure precisely how it works.

Dr. Miller expressed optimism that brain researchers will eventually figure that out, and possibly unlock the secrets of other neurological disorders that could lead to similar therapies to treat them.

"The sky is the limit as time moves forward," he said.

Other neurologists agreed.

"We're just in the beginning of a whole new era of research in which DBS devices both provide stimulation and also detect and analyze brain activity," said Dr. William Marks, Professor of Neurology at the University of California, San Francisco. "This is just the initial phase of what will be a remarkable evolution in our knowledge--which will help us better understand many different disorders of the brain and develop even more effective treatments."

Such research is underway but it will take years to unravel the brain's mysteries.

It's believed one million Americans suffer from Parkinson's disease, and deep brain stimulation was approved by the FDA to treat the symptoms of advanced Parkinson's disease in 2002. Since it was first introduced more than 25 years ago, more than 135,000 people worldwide have received

Medtronic DBS Therapy to treat symptoms of devastating neurological disorders such as advanced Parkinson's disease and essential tremor.

The deep brain stimulation procedure on Greg Grindley was similar to hundreds performed by the hospital's neurosurgical team; the only significant difference was the historic live broadcast on National Geographic, seen in 171 countries in 45 languages.

**This therapy is not for everyone. Please consult your physician. To learn more about Deep Brain Stimulation, [click here.](#)**

### **Important Safety Information**

Medtronic DBS Therapy for Parkinson's disease: Patients should always discuss the potential risks and benefits with a physician.

### **Medtronic DBS Therapy for Parkinson's Disease:**

Bilateral stimulation of the internal globus pallidus (GPi) or the subthalamic nucleus (STN) using Medtronic DBS Therapy for Parkinson's Disease is indicated for adjunctive therapy in reducing some of the symptoms of advanced, levodopa-responsive Parkinson's disease that are not adequately controlled with medication.

**Contraindications:** Contraindications include patients who will be exposed to MRI using a full body radio-frequency (RF) coil, a receive-only head coil, or a head transmit coil that extends over the chest area, patients who are unable to properly operate the neurostimulator, or for Parkinson's disease and Essential Tremor, patients for whom test stimulation is unsuccessful. Also, diathermy (e.g., shortwave diathermy, microwave diathermy or therapeutic ultrasound diathermy) is contraindicated because diathermy's energy can be transferred through the implanted system (or any of the separate implanted components), which can cause neurostimulation system or tissue damage and can result in severe injury or death. Transcranial Magnetic Stimulation (TMS) is contraindicated for patients with an implanted DBS System.

**Warnings/ Precautions/Adverse Events:** There is a potential risk of tissue damage using stimulation parameter settings of high amplitudes and wide pulse widths. Extreme care should be used with lead implantation in patients with a heightened risk of intracranial hemorrhage. The lead-extension connector should not be placed in the soft tissues of the neck due to an increased incidence of lead fracture. Theft detectors and security screening devices may cause stimulation to switch ON or OFF, and may cause some patients to experience a momentary increase in perceived stimulation. Although some MRI procedures can be performed safely with an implanted DBS System, clinicians should carefully weigh the decision to use MRI in patients with an implanted DBS System. MRI can cause induced voltages in the neurostimulator and/or lead possibly causing uncomfortable, jolting, or shocking levels of stimulation. Patients using a rechargeable neurostimulator for Parkinson's Control Therapy or Tremor Control Therapy should check for skin irritation or redness near the neurostimulator during or after recharging, and contact their physician if symptoms persist.

The DBS System may be affected by or adversely affect medical equipment such as cardiac pacemakers or therapies, cardioverter/ defibrillators, external defibrillators, ultrasonic equipment, electrocautery, or radiation therapy. Safety and effectiveness has not been established for patients with neurological disease other than Parkinson's disease or Essential Tremor, previous surgical ablation procedures, dementia, coagulopathies, or moderate to severe depression; patients who are pregnant; patients under 18 years; and patients over 80 years of age for Medtronic DBS Therapy for Tremor. For patients with Dystonia, age of implant is suggested to be that at which brain growth is approximately 90% complete or above. Depression, suicidal ideations and suicide have been reported in patients receiving Medtronic DBS Therapy for Movement Disorders, although no direct cause and effect relationship has been established.

Abrupt cessation of stimulation should be avoided as it may cause a return of disease symptoms, in some cases with an intensity greater than was experienced prior to system implant ("rebound" effect). Adverse events related to the therapy, device, or procedure can include: stimulation not effective, cognitive disorders, pain, dyskinesia, dystonia, speech disorders including dysarthria, infection, paresthesia, intracranial hemorrhage, electromagnetic interference, cardiovascular events, visual disturbances, sensory disturbances, device migration, paresis/asthenia, abnormal gait, incoordination, headaches, lead repositioning, thinking abnormal, device explant, hemiplegia, lead fracture, seizures, respiratory events, and shocking or jolting stimulation.

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