



Don Huth and his son, Chris, stroll through Harvard Gulch Park just a few weeks after Huth's surgery at Porter Hospital.

stimulating

future

by
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brain stimulation procedure gives young
Parkinson's patient hope for the future

Don Huth has had Parkinson's disease for seven years. In those seven years, he's had to give up his job, restrict his driving and miss out on too many family events to keep count.

So when Huth learned about a treatment that would provide better control of his symptoms, he didn't hesitate to sign up—even though it meant surgery to place electrodes deep inside his brain.

The treatment, called deep brain stimulation (DBS), works by sending electrical impulses to electrodes implanted in the brain, blocking impulses that cause Parkinson's symptoms such as tremors. Although DBS has been around for 20 years, it is typically only used with older patients who have advanced cases of the disease. What's different about Huth, however, was his decision to have the procedure so young. Huth is just 52 and has had Parkinson's disease less than a decade. Traditionally, patients don't opt for this procedure until they are well into their second or third decade of Parkinson's disease.

"Mr. Huth is the perfect patient for this procedure," says David VanSickle, M.D., a neurosurgeon at Littleton and Porter Adventist Hospitals who performed the procedure. "Many people wait until they are so debilitated by the disease that it's hard to regain their abilities."

Although the procedure will not cure the disease, it will help ease the symptoms. And that means everything to Huth, who has four children, including two still in school.


"My family doesn't stop just because I have Parkinson's," Huth says. "The kids come home and they need to go places. It's just very difficult. I just want a piece of that back, a chance to enjoy some of what my family experiences."

deep brain stimulation

Deep brain stimulation is used for patients with Parkinson's disease as well other movement disorders. For more information on the procedure, please contact David VanSickle, M.D., South Denver Neurosurgery, at **303-734-8650**.

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facing the future

 Just two weeks after meeting VanSickle and learning about DBS, Huth lay on a gurney at Porter Hospital, waiting to be taken into the operating room to have the electrodes implanted. Relaxed, despite what was to come, Huth reminisced about the birth of their youngest daughter with his wife, Jennifer, and joked about the youthfulness of the obstetrician on call. "I told her that the doctor was peeking in a manual he had stashed in his pocket to figure out what to do next," Huth teased.

Turning his attention to his current hospital visit, he played down the seriousness. "I'm not nervous about the procedure," he says. "What makes me nervous is that I might get a second chance and I'm anxious about how I will use the time. I'm not looking to change the world, but I hope I can make the most of things if I get a second chance."

A few minutes later, Huth is taken into the operating room. He is given a light sedative and his skull is numbed. He falls into a light sleep. Although he could stay awake for this part of the procedure because he would not feel any pain, it is more comfortable if patients do not hear the drilling or imagine what is happening, VanSickle says.

* how it happens

After Alzheimer's disease, Parkinson's disease is the most common neurodegenerative disease. First described in 1817 by British physician James Parkinson, it is characterized by shaking limbs, rigidity, slow movement and poor posture. It typically occurs in people over the age of 60, but 5 percent to 10 percent of cases occur in people under the age of 40, according to the National Parkinson Foundation.

Parkinson's is a chronic, progressive disease that occurs when nerve cells in the midbrain die or become impaired. These nerve cells produce dopamine, which signals other parts of the brain to coordinate movement. Without dopamine, the brain's control centers become unregulated and cause Parkinson's symptoms.

Huth is considered young to have been hit by Parkinson's disease. He was diagnosed at age 45. He is mostly affected by rigidity. During the day when his symptoms get worse, he loses the dexterity in his left arm and his left leg "freezes" to the ground so that he has to lift it with his arms or drag it to move. He sleeps just two or three hours each night because his body grows so stiff and painful overnight.

"When I first found out I had Parkinson's, I was mad, angry, confused," he says. "I felt cheated because my career was doing very well and I had this great family. I decided I was going to beat it by ignoring it, but then I needed drugs

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just to survive. I gained weight. I started having bouts of depression. I stopped exercising and doing other things I loved to do.”

Huth slowly came to grips with his disease. The medications helped. But like most Parkinson’s patients, Huth experiences what is known as “on” times and “off” times. When the medicines work, Huth feels nearly back to normal. But when and whether the medicines will work is always a question.

deep inside the brain

***** *It takes VanSickle about 90 minutes from when Huth is wheeled into the OR to set up for the procedure, numb his scalp, and then to make the incisions and peel back the skin to reveal the skull. Once there, he drills two small holes into the top of Huth’s head. He will feed the 1-mm-thick electrodes through the holes deep into the midbrain, trying to hit the bundle of nerve cells that are generating the electrical signals causing the trouble. The target is called the subthalamic nucleus and is just a fraction of the size of a pea. Earlier MRI and CT scans lead VanSickle close to the target, but the final minute adjustments must be made by VanSickle’s ear.*

The nerve cells release electrical signals that emit a frequency. As VanSickle guides the electrodes, he listens carefully to the frequency sounds being captured by a nearby computer monitor and broadcast on stereo speakers in the operating room.

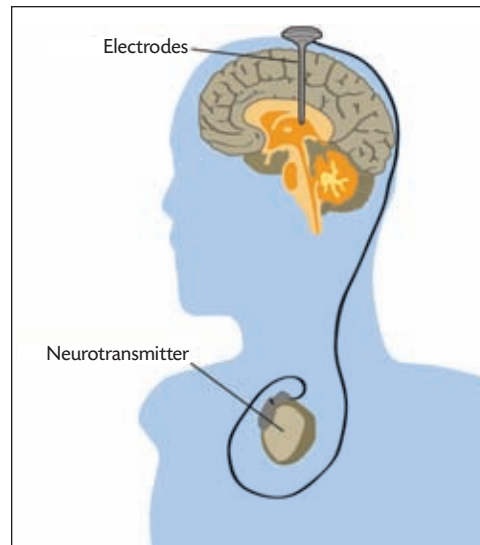
But as VanSickle gets closer to the target, the computer begins picking up interference and the physician cannot get a clear sound. He asks that all lights except those directly overhead be turned off. When that still doesn’t remove the extraneous sounds, nurses and technicians begin shutting down other noncritical equipment. Extra computers, monitors and even cell phones are turned off. Eventually, they find the source—pressurized leggings that were put on Huth to help keep his circulation flowing during the three-hour surgery.

Once the noise is cleared and VanSickle is able to hear the frequency emissions, he directs a team to move Huth’s limbs. He listens patiently, letting the barely audible sound lead him to the malfunctioning nerves.

Four hours after Huth was brought into the OR, he is taken out again. Although the most difficult part of the procedure is complete, Huth will have to return to the hospital three weeks later to have a neurotransmitter implanted in his chest and the system turned on.

***** a pacemaker for the brain

Deep brain stimulation was developed in France in 1987. It works by sending continuous electrical pulses to targeted areas in the brain to block the impulses that cause the tremors and rigidity.



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Doctors aren’t sure exactly how the pulses work, but they appear to block the abnormal firing of neurons caused by the lack of dopamine. Overall, DBS reduces 50 percent to 60 percent of Parkinson’s symptoms, but it does not cure the disease, which will continue to progress in Huth’s body throughout the years.

“Every year, Mr. Huth will do better than he would have done without the procedure, but it doesn’t stop or even slow the progression of the disease,” VanSickle says. “Until we can find a cure, we’re trying to preserve quality of life for as long as possible.”

Deep brain stimulation also does not help relieve the nonmotor symptoms of Parkinson’s, including depression, cognitive decline and memory loss.

Huth says he doesn’t harbor delusions about the procedure. “It’s not a cure; I know that,” he says. He talks instead about getting more “on” time. What that means is that he hopes his symptoms will get better and his medications will work more predictably.

What it really means is being able to sleep more than a few hours, maybe ride a bike, go to a football game with his son and eat out with his friends again.

60,000 programming options

***** *It takes Huth about an hour to wake up from the surgery. He leaves the hospital the next day, feeling already as if the procedure is working even though he knows his electrodes haven’t been turned on yet.*


He’s not imagining things. For reasons unknown, just the act of placing the electrodes in the brain brings temporary relief to patients,

VanSickle says. The effect doesn't last long, just a couple of days. The return to reality is disheartening for Huth. "For the first few days, it was euphoric, but it subsided," he says. "I was a little disappointed, but I'm still optimistic about what's to come."

Three weeks later, Huth is back in the hospital for the next step. The electrodes have to be connected to a neurotransmitter that will sit behind Huth's chest muscles and control the electrical impulses. Wires from the electrodes are run down his skull, behind his ear and connected to the small battery-run pack.

The procedure to implant the neurotransmitter is minor. The real work begins once the unit is turned on. Because the device can be programmed up to 60,000 different ways, it takes a few days—and sometimes longer—for the unit to be fine-tuned.

In Huth's case, the work doesn't take nearly that long. Once the transmitter is turned on, he gets almost instant relief from his symptoms. He spends four days in the rehabilitation unit at Porter Hospital for fine-tuning. But by the time he goes home, he has cut his medications in half and he isn't experiencing any periods when his symptoms are uncontrolled.

"I got out of the hospital in time to watch the Rockies with my son, my longtime best friend and my very close neighbors," says Huth, recalling the first night home when he was able to watch the Colorado Rockies pick off the Arizona Diamondbacks in the first game of the National League Division Championship series. "It was so enjoyable, and for the first time in a very long time, I was at peace with my Parkinson's." 

Parkinson's disease resources

For more information on Parkinson's disease, contact:

- **American Parkinson Disease Association**
135 Parkinson Ave.
Staten Island, N.Y. 10305-1425
apdaparkinson.org
800-223-2732
- **National Parkinson Foundation**
1501 N.W. 9th Ave.
Bob Hope Road
Miami, FL 33136-1494
parkinson.org
800-327-4545
- **Parkinson's Disease Foundation**
1359 Broadway
Suite 1509
New York, N.Y. 10018
pdf.org
800-457-6676
- **Parkinson Alliance**
P.O. Box 308
Kingston, N.J. 08528-0308
parkinsonalliance.org
800-579-8440



Don Huth talks about his progress with neurosurgeon David VanSickle, M.D.