Alberta Health Services | UNIVERSITY OF CALGARY

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Researchers investigate new treatment for depression

CALGARY — An experimental treatment for depression is showing promising results in a study underway at Alberta Health Services' Foothills Medical Centre.

Deep brain stimulation (DBS), in which surgically implanted electrodes deliver impulses to the brain, is being tested on people who have tried most other forms of treatment for depression without any relief.

"Deep brain stimulation has been effective in helping control tremors due to Parkinson's disease and other movement disorders, but there has been little research to evaluate its effectiveness in people with treatment-resistant depression," says Dr. Zelma Kiss, an AHS neurosurgeon and co-principal investigator in the study.

"It doesn't work for everyone but, for those who do see benefits, the improvements can be quite remarkable," says Dr. Kiss, also an associate professor in the Department of Clinical Neurosciences in the University of Calgary's Cumming School of Medicine.

Early research indicates about one-in-two people undergoing DBS will experience at least a 50 per cent decrease in the severity of depression. Within that group, depression will almost disappear in half of those people.

Calgary researchers are particularly interested in pinpointing the optimal levels of stimulation to improve the therapy's effectiveness. Patients in the study will be followed for nine to 15 months. The study is based out of the U of C's Hotchkiss Brain Institute and Mathison Centre for Mental Health Research and Education and is funded by Alberta Innovates - Health Solutions.

Study participants undergo a six- to eight-hour neurosurgery in which brain activity is analysed to determine the optimal location for implanting the electrodes. Then, a few days later, the patient has a second operation to insert a brain pacemaker under the skin of the chest to control the electricity delivered to the electrodes.

To date, four patients have been enrolled in the study; researchers are still looking for another 20 to take part. To be eligible, patients must have tried all other therapies for depression, such as at least four classes of anti-depressants, cognitive behavioural therapy, psychotherapy, electroconvulsive shock therapy or transcranial magnetic stimulation.

"Usually the people eligible for deep brain stimulation will have suffered from major depression for decades," says AHS psychiatrist Dr. Raj Ramasubbu, co-principal investigator in the study. "Often their depression is so debilitating that it affects every aspect of their lives. Family relationships suffer, work becomes impossible, and their overall quality of life is very poor," says Dr. Ramasubbu, an associate professor in the Department of Psychiatry.

It's estimated about one per cent of the population have treatment-resistant depression – about 10,000 people in Calgary.

Jared, 28, one of the early recruits to the study, says he has experienced enormous improvements since he underwent neurosurgery last January.

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"It didn't have much effect right away but, every month since then, it's gotten a little bit better. Now the difference is like night and day," says Jared, who has been hospitalized numerous times for suicidal thoughts since being diagnosed with depression at age 11.

"I'm working full time, I go out socially, and I can think clearly. Before, I felt defined by my depression – my whole life was about managing it. Now, I can be me again."

With deep brain stimulation, the electrical impulses are thought to readjust the brain pathways involved in depression, although the exact mechanisms by which it works are unknown. The therapeutic brain-stimulating electrodes are implanted in a specific area of the brain, both the right and left sides, called the subgenual cingulate region. Patients don't feel the electrical stimulation and they can turn off the device at any time.

Another patient, Sandra, has also felt better since beginning DBS therapy three years ago, although her improvement hasn't been as dramatic as Jared's.

"I still take a lot of medication and I wouldn't say that I'm cured, but it's a whole lot better than it was," she says. "I cope better with everyday life. And my husband doesn't worry about leaving me alone like he once did."

Sandra left her job in 2007. She says she tried almost 20 different types of anti-depressants before her psychiatrist suggested DBS.

Dr. Kiss notes that DBS therapy is not for everyone, but may help some patients with treatment-resistant depression. It should only be performed within a formal study while medical scientists study how it works, what the ideal stimulation settings are, and who is most likely to respond. For more information, contact the study coordinator at 403-210-6905.

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B-roll is available of a portion of the neurosurgery at the ftp site below. For an explanation of activity filmed, see the accompanying document, DBS neurosurgery b-roll notes.docx.
URL: ftp://208.118.126.84; Folder: B-ROLL FMC DBS NEUROSURGERY
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