

Deep-brain stimulation

A radical Parkinson's treatment continues to show positive results, writes Lorraine Sathico

The term deep-brain stimulation might bring to mind really hard crossword puzzles or Sudoku, but in fact it's an established surgical procedure for which experts are finding more and more uses. It involves drilling a hole in the skull to insert electrodes into the brain. The procedure has been used to treat Parkinson's disease and other movement disorders for years, with about 60,000 people worldwide having gone under the drill. It is no longer seen as a last-ditch treatment. "We used to wait until it got really bad before resorting to surgery, but now we're seeing that people can benefit from deep-brain stimulation sooner rather than later," says neurologist Peter Silburn.

■ **Why it happens** Parkinson's is caused by the progressive deterioration of the

brain's nerve cells responsible for producing dopamine, a chemical necessary for controlled movement. When levels are depleted, problems like trembling, stiffness and sudden slowed movement can occur. Medication to restore dopamine levels is used as a first-line treatment for Parkinson's.

■ **High success rate** Neurosurgeon Dr Terry Coyne, Silburn and their team at Brisbane's St Andrew's War Memorial Hospital have performed deep-brain stimulation more than 400 times. "About one-third of patients are able to stop taking medication after the procedure and most of the others can significantly reduce their intake," explains Silburn. "In about eight per cent of cases the procedure doesn't work, perhaps because of the type or severity of the disease."

■ **The goal: symptom relief** The goal of deep-brain stimulation is to maintain the same level of symptom relief by applying a constant pulse of electricity. To achieve this, the electrodes are permanently placed in the brain. The procedure is not a cure, but it can provide instant symptom relief in cases where medication is not effective or side effects are causing problems.

■ **How is it done?** The surgeon uses sophisticated imaging and computer technology to locate the target area and implant the electrodes in the part of the brain responsible for the symptoms. The patient is under general anaesthetic for the initial part of the procedure, but is woken when the surgeon is within 5mm of the target area. If the idea of waking up before the surgery is complete sounds gruesome, the operation itself doesn't hurt because the brain has no pain receptors. Silburn says that most people report no more discomfort than you would expect from a dental procedure.

The precise spot to place the electrode is determined by watching the patient to see when the symptoms resolve. Each electrode is connected to a wire that passes under the scalp, behind the ear and over the shoulder to connect to a small battery implanted under the skin of the chest. It is invasive brain surgery, though, so is not without risks. They include stroke, brain haemorrhage and paralysis, as well as the risks associated with general anaesthetic.

FACTS & FIGURES

■ Medicare and private health insurers cover much of the cost of the procedure but, depending which centre you use, there may be out-of-pocket expenses up to about \$10,000, says Silburn.

Useful resources ■ Parkinson's Australia, www.parkinsons.org.au. ■ St Andrew's War Memorial Hospital, www.uhealth.com.au.

