**Back to the Frontal**  
by Danielle Egan

**Psychiatric neurosurgery is back. And no one’s really sure if—or why—it works.**

In the OR at Vancouver General Hospital, a metal circle—a stereotactic ring, as it’s called—is bolted to a patient’s head, which has been locally anaesthetized. A cage-like metal frame rigged with water tubes is then attached to the ring, and an MRI scan uses these attachments to plot the route to the surgical target: the internal capsule, deep inside the frontal lobes of the brain.

Two holes, each about the size of a dime, are then drilled into the skull, above the frontal lobes—an area of the brain that some call the brain’s CEO. The frontal lobes are also known as the seat of personality—they act like the conductor of a giant orchestra, sorting memory, controlling problem-solving and decision-making, spontaneity and impulse control.

The patient is conscious but can’t feel the metal probe as it slides through brain tissue to the internal capsule. The tip of the probe is heated to 70 degrees for 60 seconds, burning a rectangular lesion, 2.5 cm by one cm, into the brain tissue. This is then repeated on the other side of the capsule.

The lesions “intercept the circuits responsible for emotion,” says UBC psychiatrist and neurologist Dr. Trevor Hurwitz. “The assumption is that these pathways carry the circuits that are causing disabling depression and obsessive compulsive disorder. We operate on brain structures that support a dysfunctional mind.”

“Psychiatry” he says, “is rediscovering its roots.”

Five B.C. residents have had this procedure—an “anterior capsulotomy”—since Hurwitz first established a controversial limbic surgery program at UBC in 2000. Also referred to as psychosurgery, surgical procedures on the frontal lobes are probably more famous to the public under the archaic catch-all term “lobotomy” and the chilling pop-cultural imagery—a stupefied Jack Nicholson in One Flew Over The Cuckoo’s Nest, or once-feisty starlet Frances Farmer, allegedly rendered dull and compliant by an ice pick—associated with it. Most
people would assume that lobotomies had long gone the way of leeches and rusty hacksaws.

Yet despite its once horrific reputation, psychosurgery never really went away—a handful of specialized centres, including Harvard’s Massachusetts General Hospital, two institutions in England and one in Sweden, continued to perform psychosurgery on mentally ill people through two waves of anti-psychosurgery movements—and it is presently enjoying what specialists call a “renaissance” as a last-resort treatment for mental illness.

One reason for its renewed popularity: brain surgery has become a much more sophisticated procedure since the ice-pick-wielding days of lobotomy superstar Walter Freeman (see “Pick Me,” next page). Improved brain mapping has made it much easier, for instance, to pinpoint and treat biologically based diseases such as Parkinson’s and multiple sclerosis. Yet brain mapping has its limits, especially when it comes to discovering psychiatric problems. Hurwitz admits that “we see clear-cut abnormalities in brain-based illnesses. With psychiatric disorders there’s nothing to be found.”

Still supporters of this new wave of psychosurgery aren’t stopped by an absence of physical evidence. “Basic science tells us there are major neurochemical pathways in the brain; the current thinking is that the disturbance in psychiatric disorders are disturbances in those neurotransmitters that have gone wrong. There has to be a biological mechanism.”

Psychosurgery opponents, who believe that environment and experience are the key causes of mental illnesses, take extreme issue with this reasoning. But many neurosurgeons and field specialists share Hurwitz’s intuitive rationale. Take Dr. Chris Honey, the stereotactic and functional neurosurgeon for British Columbia, who performs “any and all stereotactic neurosurgery” in the province: “I do the lesions for Parkinson’s and MS and all those types of things, so it’s natural for me to be involved in depression or OCD [Obsessive-Compulsive Disorder]. It’s just another lesion put exactly in the right place to help people,” he says.

Honey claims a 70 percent success rate with a risk of death about “about one in a hundred. It’s not dicey surgery, not 50/50—but there is a small but significant risk of something very nasty happening.” For Honey, who wanted to be a neurosurgeon at age 12, studied medicine at U of T and got his PhD at Oxford, the priority is “making sure the
surgery is done perfectly” by “hitting the target. We’re seeing the target area, localizing it and aiming for it.” No wonder the psychosurgeries of today are referred to as “precision bombing” in comparison to the carpet bombing style of the lobotomies of yore.

Still, like Hurwitz, Honey can see abnormalities in the brain tissue of a patient with Parkinson’s but admits he “can’t see a disturbance” in his depressed patients. And after surgery “their depression doesn’t melt away or anything. With a Parkinsonian patient, their symptoms are gone—boom—on the [operating] table.” Regardless, Honey also believes in the “empirical” evidence that neurosurgery helps curb severe depression and OCD. “We know it works, but we’re not sure why. We’d love to know.”

Only one of his five B.C. patients, says Hurwitz—four were treated for depression; one for O.C.D.—has developed “significant fatigue from the surgery, which I consider a bad outcome. We’ve had two people with very good outcomes. One person’s had a moderate outcome. But the suicidal thoughts and self-destructive behaviour have gone...The person with O.C.D. says he’s 70 percent better.”

Dr. Susanne Bejerot, who studied capsulotomy results at Sweden’s Karolinska Institute in the early 90s, has some serious issues with this sort of self-assessment. “If a person has dysfunctional frontal lobes, can he or she reliably assess his or her own personality deficits—considering that the very capacity to do so resides in the frontal lobes?”

There are also problems with researcher bias, she points out, leading to wide definitions of “positive outcomes.” “Examples of side-effects after capsulotomy known to me,” she tells me, “are one man who raped his wife in front of the children—but was defined as a responder as his O.C.D. symptoms had abated—and another ‘successful case’ who stole a bus many years after surgery.” And while Bejerot accedes that “there is no doubt that neurosurgery can dramatically reduce obsessions and compulsions,” she thinks “the question is, at what price?”

Bejerot cites examples of severe personality changes after neurosurgery, such as a man who started making “improper advances to young girls” post-op. She also found that researchers placed people who gained weight (a very common post-op effect) on the positive outcomes list, claiming it showed an ability to “relax and enjoy life.” Her worries about researcher bias echo the concerns of a recent U.K.
study that noted “poor” outcome data and pointed out that no randomized controlled trials had ever been conducted. This 2003 study also remarked on the lack of data regarding capsulotomies performed on patients suffering from severe cases of depression.

“There’s no question that the surgery has been life-saving,” contends Hurwitz, who freely admits that his own “neurotic vulnerability” first attracted him to psychiatry. “The last person I saw said that if it weren’t for the surgery she wouldn’t be alive today. It is a life-saving procedure.” About 15 percent of depressed people will kill themselves rather than endure severe depression. “It’s like a toothache, a deep ache in your soul,” says Hurwitz. “You can’t function and everything comes to a halt. It’s a dark cycle of pain.”

You have to be in very bad shape to end up in Hurwitz’s office contemplating surgery. Candidates must meet what they believe is a rigorous set of criteria: adult patients “brought to their knees by disability, in dreadful despair, ill for more than five years, had all available therapies.” They have to be referred by a psychiatrist who guarantees they’ll stick with the patient for 10 years. “For depression they’ve had to have almost every drug, at least two courses of electroconvulsive therapy and must still be in unspeakable ongoing despair.” Once they pass Hurwitz’s checklist, they’re referred to three other psychiatrists and Dr. Honey. All have to be convinced these candidates can give informed consent.

“To be honest with you, their back is often against the wall,” says Honey about the patients who choose psychosurgery. “I have to be certain in my heart that the patient understands both the benefits and the risks and has the mental faculties to weigh that.” Hurwitz agrees that the procedures are controversial and have a troubling past. But “we take an unfair hit,” he believes. “The bad apples must be few and far between.” He wouldn’t endorse psychosurgery for behaviour control in “a bazillion years. You want to stay as far away from that as possible. It’s a terrible slippery slope. If you vote NDP and I vote Liberal, we can put all the NDPers under psychosurgery? The horrors of what could happen are unimaginable.”

“It’s the same old lobotomy that was rejected by science, medicine and the public decades ago,” says outspoken anti-psychosurgery psychiatrist Peter Breggin. “Capsulotomy cuts thousands of nerve connections that run in a bundle to the frontal lobes and therefore should be classified as a form of lobotomy. It can only work by blunting the individual’s emotional responses and judgment to such a
degree that the individual stops complaining. The cost? The individual’s personality and identity have been severely impaired.”

Breggin is gravely concerned about the renewed interest in psychosurgery. In 2002 he testified on behalf of a woman severely brain damaged after a combined capsulotomy and cingulotomy at Cleveland Clinic. The jury gave her $7.5 million dollars, and the clinic stopped performing psychosurgeries. In 1999 British actress Lena Zavaroni died of post-psychosurgical complications designed to treat her severe anorexia. More than 10 years earlier, the families of two different young American women were destroyed post-psychosurgery. One girl committed suicide after receiving a cingulotomy to treat depression. Another became brain damaged after attempting suicide at an eating disorders clinic.

“You can’t save everybody,” says Hurwitz who firmly believes psychosurgery helps much more than it hurts, and who is committed to doing whatever it takes to keep his patients alive. “You know these people intimately, better than you know many people. You think, it’s devastating, what a waste. It was a mood disorder, did I miss the cues? Why are people killing themselves?”

“I don’t think this can help but be controversial,” says Honey. “You are changing the way someone thinks, and that smacks of danger.” He endorses strict guidelines and “people looking over our shoulders. We have no vested interest in this. It’s a tremendous hassle to do one or two people a year and spend an hour with you and all these meetings. I would be much happier to just do another Parkinsonian patient and have a bouquet of flowers on my desk in the morning. These are happy people. But I think we are saving their lives.”

As depression rates continue to rise, medical studies say that eight percent of us will suffer major depressive disorders, and gloomy forecasters predict that by 2020 depression will be the second leading cause of disability. While anti-psychiatry advocates argue that we should put more effort into helping people get psychotherapy, biopsychiatrists—and now even GPs—tend to treat mental illnesses with pharmaceuticals, even though sugar pills can have better efficacy rates.

“We’ve given up the fantasy of curing,” says Hurwitz. “But the march of science is allowing us to show that the brain is the plinth of the mind. I believe that the major illnesses are biologically driven, but
science hasn’t gotten to the point that we can prove that. Everything is open for debate. I think I’ll be long dead before this gets solved.”

**Burning a Better Brain?**

Each centre performing psychosurgery targets different areas of the brain, and the “success rates” they claim range wildly, from 25 to 60 percent. While studies from the ‘60s and ‘70s touted a 70 percent success rate, recent data is much less promising. Canadian neurosurgeon Dr. Rees Cosgrove runs the functional surgery centre at Massachusetts General Hospital, where over 1,000 cingulotomies (A cingulotomy targets lesions in the cingulum bundle of the frontal lobes) have been performed over the past 40 years.

Cosgrove admits that “no matter which structure in the limbic system is chosen...the clinical outcome appears similar,” but he also finds it “intuitively appealing” that psychosurgery works for 50 to 67 percent of recipients. More recently, an assessment team used “strict criteria for successful outcome” and found that less than a third of patients benefited. (Note that some modern studies have also established that the “placebo effect” helps a third of people, no matter the illness or treatment.) A large study done in 1987 found that 12 percent of patients committed suicide after cingulotomy, while a ‘90s study found that nine percent developed seizures and a 1995 study found that 50 percent had “no response” post-op. Two 1995 reports from the U.K.—where the preferred procedure is subcaudate tractotomy—found that 25 percent of patients had “slight or no relief,” while 31 percent were “worse or the same.” Sweden’s Karolinska Institute capsulotomy data from the ‘90s found post-op “frontal lobe syndrome” in 33 percent of patients. Another study claims 93 percent of patients were “fully or markedly improved” even though 50 percent had “perseveration,” a symptom of frontal lobe damage, and 33 percent were depressed post-op. A 2003 capsulotomy study reports “significant adverse events” in more than a quarter of patients, including apathy, inability to do basic chores, aggressiveness, “indecent exposure,” addiction problems and post-surgery suicide attempts in “a substantial number of patients” even among OCD sufferers, who rarely become suicidal in other treatment models. —D.E.

**Pick Me! A Short History of Psychosurgery**

It all started with a couple of chimps presented at a 1935 London conference. Their frontal lobes had been removed, leaving them pliant creatures. Portuguese neurologist Egas Moniz and U.S. psychiatrist
Walter Freeman both attended and both had light-bulb moments: Moniz started using “prefrontal leucotomy” that would “modify corresponding ideas and force thoughts into different channels” with lesions placed in circuits along the limbic system, which was believed to generate emotions, memory and personality. Moniz coined the term psychosurgery and started churning out high success rates.

Freeman and doctors all over the globe leapt at the opportunity to try out lobotomies at their hospitals, which experienced 80 percent jumps in admission rates during the ’30s. War vets, homosexuals, women who liked sex, women who didn’t like sex, rebel teens and pot-smokers consented to or were forced under the knife to cure their behaviour disorders. All were believed to have dysfunctional brain circuitry. Doctors cheered success stories and rarely reported occurrences of brain damage and dramatic personality changes such as post-op violent behaviour. Moniz won the 1949 Nobel Prize in medicine, which solidified the credibility of psychosurgery for years to come.

Fifty thousand lobotomies were performed in the U.S. by 1955, thanks largely to Freeman, who, after falling out with his partner neurosurgeon James Watts, grabbed an ice pick from his kitchen drawer and went solo with a modified procedure that could be done in an outpatient setting. He hammered the ice pick through the eye cavity and into the frontal lobes, sweeping it back and forth, severing connections with the rest of the brain. Freeman believed loss of creativity, intellect and motivation were acceptable, even positive outcomes allowing the patient “social adaptability” and “at least a chance of earning his living.”

Freeman became a surgical rock star. He took his show on the road, along with a gold-plated ice pick and a backdrop for photo opportunities. He made grown male doctors swoon and faint watching his operations (he performed about 4,000 in total). “In ordinary language, the technique severs the nerves that deliver emotional power to ideas,” he said. “Along with a cure comes some loss in the patient’s imaginative power. But that’s what we want to do. They are sick in their imaginations.”

“Lobotomy gets them home,” was Freeman’s favourite motto. In reality, almost half of lobotomized patients left the hospital in a body bag. Most survivors had seizures, some got violent, sexually aggressive (Freeman called it “the cave-man level” and advised wives respond at the “cave-woman level” which “may not be agreeable at
first, but she will soon find it exhilarating if unconventional”) and others were zombified into vegetative states.

Psychiatric drugs came into vogue in the mid ’50s and became the preferred treatment of choice for the masses, but hard cases were still referred to small neurosurgery centres. The 1967 Detroit “Race Riots” inspired neurosurgeons Vernon Mark and William Sweet and psychiatrist Frank Ervin (who now works at McGill and the Allen Memorial Institute researching aggression in humans) to write a book called Violence and the Brain, suggesting that brain lesions in “the violent slum dweller” caused “low violence thresholds.” They endorsed psychosurgical lesions to control violent behaviour and convinced the U.S. government’s National Institute of Mental Health to supply grant money. Meanwhile Mississippi neurosurgeon Orlando Andy performed psychosurgeries on black children while California governor Ronald Reagan planned to set up a psychosurgery program. But civil rights and psychiatric survivor groups kicked into action, and by 1973 a trial in Michigan ruled that psychosurgeries couldn’t be performed in state facilities. Later that decade, CIA documents were declassified implicating the involvement of psychiatrists with military mind control experiments conducted from the ’40s to the ’60s. Among them was the infamous Canadian psychiatrist Ewen Cameron, founder of McGill’s psychiatry program, who performed hundreds of lobotomies on Canadian mental hospital patients and prisoners.

Psychosurgery fell off the public radar in the ’70s, while the more controversial psychosurgeons went underground: they no longer ran official programs or published data. Hurwitz studied psychiatry and neurology in Boston during the ’80s. “At that time, they were doing surgery for violence,” says Hurwitz. “It was incredibly controversial, with social implications. You become an agent of social control.” MRI was developed during this period, and psychosurgeons began to argue that psychosurgical procedures had become more humane and effective. But historian David Shutts warned that “the spectre of creating submissive zombies loomed larger as contemporary stereotactic surgeons were better able to pinpoint the destruction of specific areas of the brain.” Sure enough, in 1989 Colorado Republican Dale Erickson touted “a new medical procedure which will eliminate the violent criminals from our society [and] reduce our prison population by 10 to 15 percent. This procedure is frontal lobotomy.” Erickson pictured a utopia where lobotomized prisoners could safely hang around kids and provide “slave labor. They should be punished, not coddled, and hard work is the best punishment.”
Apparently he didn’t get the press release from psychosurgery PR spinners that the term had been replaced with fuzzier, warmer terms such as psychiatric neurosurgery, neurosurgery for mental disorder and limbic surgery. To add credibility to their craft, neurosurgeons discussed the need for review boards and tighter selection criteria—limiting their patient base to consenting adults with depression and anxiety disorders, rather than schizophrenics, substance abusers or those with “personality disorders.” By 1991 the United Nations reacted to reported psychosurgery abuses worldwide—particularly in China. They mandated that no patients in mental institutions, whether voluntary or not, could be given psychosurgery. —D.E.

Published in *Vancouver Magazine*, May 2004