The Terrible PR of Electroconvulsive Therapy:

Why psychiatry's most effective therapy for depression is also its most controversial

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In 1973, a 43-year-old surgeon named Sherwin P. Nuland who was in the midst of establishing a promising career as a professor of surgery at Yale University fell into a deep, debilitating depression. Nuland had been struggling for years under the burden of a failing and increasingly hostile marriage, but when depression finally overwhelmed him, his work rapidly declined**.** Despite having spent his whole career waking before the sun rose, Nuland now began scheduling his major surgical cases for the afternoons because he could barely pull the covers off of himself in the mornings, much less get out of bed before eleven. In an intimate university medical system, it was impossible for Nuland's colleagues not to notice this change, and his referrals began decreasing, which further fueled his depression. By the time Nuland had his moment of reckoning and despaired to himself 'My God, I can't work anymore,' he did not have any patients left to work on.[1]

Nuland entered himself into acute inpatient psychiatric care at his hospital. Friends and colleagues, some of whom he had gone through medical school and residency at Yale with, came to reassure him. "Don't worry Shep, six weeks you're back in the operating room, everything's going to be great." The empty optimism of his colleagues could not stop Nuland's illness from overtaking him. His gait became increasingly hunched and shuffling, like an old man worn down by age and disease, not the man of impressive intellect and manual dexterity that he had been months prior. "It got so there was a throbbing, there was a ferocious fear in my head. You've seen this painting by Edvard Munch, *The Scream*… Every moment was a scream," Nuland recalls.[1]

Four long months of hospitalization later, Nuland was only getting worse, growing more psychotic and obsessive in his thoughts. The physicians of the institution, having tried every psychotherapy and medication available, decided that the only remaining option was a pre-frontal lobotomy, as devastating as they knew the probable outcome to be. The only person who objected was a young, 27-year-old psychiatry resident assigned to Nuland's care. He implored his attendings to try a course of electroconvulsive therapy (ECT), threatening to resign otherwise. With no belief that it would make any difference, the staff relented.[2] It was not until the ninth session of treatment that Nuland began to see a glimmer of change through his numb, myopic fog. But by the time he had completed 20 sessions, Nuland felt a new hope. Over the next four months after completing his ECT course, Nuland remained in hospitalization, slowly healing and recovering until his depression and obsessive thoughts completely disappeared.[2]

Nuland returned to his career at Yale not only as a professor of surgery but also of bioethics and medical history. He became a prolific author, contributing to major national media outlets like *the New York Times*, *the New Yorker*, *Life*, *Discover*, *National Geographic*, *Newsweek,* and *the Boston Globe* (to name a few) as well as editing various medical journals. He eventually retired from surgery to write full-time, and his books went on to garner accolades (such the National Book Award, Pulitzer Prize finalist, Books Critics Circle Award) and top best-seller charts.[3] In 2001 when Nuland spoke publicly about his ECT treatment for the first time, he credited it as having saved his life.[1]

Today, ECT (in a mechanism that is still not understood) uses electrically induced seizures to treat a variety of mental health conditions, most commonly depression. While antidepressant medications are much better known, repeated trials have demonstrated that more people respond to ECT than to these medications, particularly tricyclic antidepressants and monoamine oxidase inhibitors. No treatment for depression has ever been found to be superior to ECT in any study. ECT has also shown equal efficacy to lithium for treatment of acute mania and to antipsychotics for treatment of schizophrenia. The combination of ECT with antipsychotics demonstrates faster response and less likelihood of schizophrenic relapse than antipsychotics alone.[4,5] Despite these findings, as of 2011, only 8% of psychiatrists offer ECT, and the annual number of people treated with ECT in the US has decreased from 300,000 in the 1950s and 60s to 100,000 today. Given the fact that major depression has a prevalence of 14.8 million among American adults, one might wonder why ECT is not more utilized.[5]

But ECT has also often been portrayed in the public imagination as a human rights abuse born out of physician hubris, unethical science, and disregard for the humanity of the mentally ill. During my psychiatry rotation in my third year of medical school, I myself was surprised to see ECT being treated as a legitimate therapy and used for a wide variety of conditions. Before medical school, my vague notions of ECT fell into the same vein as lobotomy; I assumed it was an antiquated experimental treatment from the annals of questionable medical history and ethics**.** As ECT is not a subject required to be taught in US medical schools, nor is it a

required skill in psychiatric residency training,[6,7] many a medical student or physician before me has likely thought the same thing.

Leon E. Rosenberg, a physician who has formerly held positions as dean of the Yale School of Medicine, head of pharmaceutical research for Bristol-Meyers Squibb, and professor of molecular biology at Princeton writes that in 1998, when his own psychiatrist suggested ECT to treat his severe, suicidal depression, he responded with surprise.

> "I thought that ECT had been abandoned years before. As a medical student at the University of Wisconsin in the 1950s, I had watched a patient with schizophrenia being given ECT. It wasn't a pretty sight—like watching Jack Nicholson in *One Flew Over the Cuckoo's Nest*. This negative image, so widely shared by the public, was reinforced by my early years at Yale. At that time the department of psychiatry was a bastion of psychoanalytic theory and practice. Drugs were rarely used; forget ECT."[8]

Similarly, one anonymous patient who cried continuously while being screened for ECT attributed her fear to the fact that "The only ECT I've ever seen was in 'Cuckoo's Nest.'" After later receiving an explanation of the treatment and the recommendation of her psychiatrist, therapist, and family to go ahead with it, she consented. Seven rounds of ECT eventually sent her melancholic depression into full remission.[5] Leon Rosenberg experienced similarly dramatic improvement with eight rounds of ECT and described the treatment as "lifesaving."[8]

The film which so shaped both Leon Rosenberg and the anonymous patient's initial perceptions of ECT is the 1973 film *One Flew Over the Cuckoo's Nest,* based on Ken Kesey's 1962 novel of the same name. It depicts the patients of a mental institute rebelling against the tyrannical control of the institute staff, who use ECT and lobotomy as methods to coerce or punish them. The film received critical

acclaim upon its release, winning five Academy awards,[9] and was selected for preservation in the Library of Congress' National Film Registry for being "culturally, historically, or aesthetically significant."[10] In the book *Stigma and Mental Illness*, Herzl Spiro MD PhD writes that any medical treatment receiving this kind of media portrayal would suffer from negative public perception. "Suppose the layman's view of surgery was shaped by movies showing operations done without benefit of anesthesia to punish heroic rebels fighting an unfair surgery ward! The public then might well manifest prejudice against surgery."[7]

A 2001 study reviewing the portrayal of ECT in 20 American films that spanned 1947-2001 found that earlier films portrayed ECT as an effective—though extreme—treatment for mental distress. In progressive decades, film depiction of ECT (including *One Flew Over the Cuckoo's Nest*) began to portray it as both more brutal and less therapeutic. Media portrayals of ECT as a cruel and inhumane treatment shape the attitudes of not only laymen but healthcare professionals as well. If Leon Rosenberg's story isn't enough testament to this, a 2002 study examining medical student attitudes towards ECT before and after being shown five recent film depictions of ECT found that support for ECT dropped by a third after watching the films. The percentage of medical student who said they would counsel family members against ECT rose from 10% to 25%.[11]

But if the medical community is to take responsibility for its own history, it must admit that ECT's bad reputation is due to more than the negative popular portrayals. It also has roots in the events surrounding the birth of ECT, which are

both enlightening and troubling, characterized by both medical ingenuity and misguidedness.

ECT's conception was a product of a debate on the philosophy of medicine during a major turning point in psychiatry. The late 1800s saw the wider medical community grow more disillusioned with the efficacy of its own interventions. Remedies such as bleeding, purging, emetics, and using compounds like arsenic, mercury, and antimony (now known for their toxicities) as drugs formed the staple of medical therapy, and physicians were beginning to question whether medicine was doing more harm than good.[12] The movement of "therapeutic nihilism," which asserted that patients were better off with little medical intervention was especially pervasive in psychiatry, where options to treat serious mental illness beyond institutionalization were hopelessly absent. It was believed that a mental illness like schizophrenia was an "endogenous, hereditary disease… the fate of the patient was determined at the moment of conception; the disease anchored in the ovum and sperm; nothing could change that fate."[13]

The discovery that broke through the fatalism of the psychiatric community came in 1917, when Austrian neuropsychiatrist Julius Wagner von Jauregg discovered he could cure dementia paralytica, now known as neuro-syphilis, by inoculating patients with malaria. Jauregg had previously observed that patients who suffered from general paralysis in addition to insanity would sometimes regain their sanity in the wake of a fever. By infecting his patients with malaria, Jauregg was able to induce a fever which would kill off syphilis' causative organism, the heat sensitive *Treponema pallidum*.[14] Once the syphilis was cured, patients were then

treated with quinine to cure the malaria. Jauregg's discovery won the 1927 Nobel Prize in Medicine, marking the first time a psychiatrist had won the Nobel Prize.[15] His work ignited interest in the possibility of biological treatments for mental illnesses, a much-needed spark of hope in the world of psychiatry.

Throughout the 1930s, experiment after experiment attempted to emulate the success with which Jauregg translated observation and theory into medical breakthrough. It was in this era that lobotomy was developed to treat psychosis, which would go on to win the 1949 Nobel Prize. In 1934, a Hungarian psychiatrist, Ladislaw Meduna, postulated an inverse relationship between epilepsy and schizophrenia based on the finding that glial cells were scarce in schizophrenia and overabundant in epilepsy.[5,13] He had also observed clinically that the psychotic symptoms of schizophrenics frequently improved after spontaneous seizures. To test his theory, he injected camphor into a schizophrenic patient who had been in a catatonic stupor for four years, causing a grand mal seizure that lasted a minute. Meduna writes that two days after the fifth treatment, the patient "got out of bed, began to talk, requested breakfast, dressed himself without any help, was interested in everything around him, and asked how long he had been in the hospital. When we told him that he had spent four years, he did not believe it." Meduna was able to reproduce his results on many more patients, eventually switching from using camphor oil to metrazol, an epileptogenic that produced more immediate convulsions.[13]

While the results of this experiment quickly caught the attention of the scientific community, the side effects did not go unnoticed. Metrazol produced a

characteristic feeling of immense terror upon injection,[5,16] and the seizures produced were occasionally violent enough to break the patient's vertebrae. In 1938, an Italian neuropsychiatrist, Ugo Cerletti, who was working on research involving electrically induced seizures in dogs decided to adapt Meduna's treatment using electricity. As the story goes, Cerletti noticed the way butchers in Italy would electrically shock pigs before slaughter, causing them to go into a sedate coma. He guessed that delivering electricity to human subjects might not only induce seizures but also anesthetize them during the convulsions. Despite having come up with the idea, Cerletti himself had apprehensions about the ruthlessness of the procedure, feeling that "the idea of submitting a man to convulsant electric discharges was considered as utopian, barbaric, and dangerous; in everyone's mind was the specter of the electric chair."[13]

The first patient Cerletti attempted his treatment on was an unidentified 40-year-old schizophrenic who had been found wandering in Rome and speaking incomprehensible gibberish, having somehow arrived from Milan by train without a ticket. In between rounds of electric shocks, as Cerletti and his team debated how to titrate up the voltage of the electricity and how many rounds to apply, the patient began to speak comprehensibly, saying "not again it will kill me!"[13] Upon cessation of the last seizure, Cerletti writes that the patient "sat up of his own accord, looked about him calmly with a vague smile, as though asking what was expected of him. I asked him "what has been happening to you?" He answered, with no more gibberish: "I don't know, perhaps I have been asleep."[13] Cerletti completed a course of 14 total treatments on the patient who remained completely symptom free for

the next two years, after which he was lost to follow up.[13] And so, Cerletti had successfully carried out the first trial of electroconvulsive therapy.

As acceptance of the therapy and the variety of its applications spread throughout Europe and to the United States, it remained a procedure with serious risk of fracture, dislocations, and dental injury.[4] Cerletti had not been correct about the anesthetizing effects of electricity and had inadvertently created a treatment which appeared even more violent to witnesses than the metrazol-induced seizures. Even with the addition of general anesthesia and muscle relaxants throughout the next few decades (radically reducing the musculoskeletal risks of treatment), the damage was done. Long after it was no longer a reality in clinical practice, the image of ECT administered without anesthesia remained in memory for psychologists, psychiatrists, and physicians like Leon Rosenberg who witnessed it performed that way during their training. Author Ken Kesey likely saw similar scenes during his time working in a mental institution in the 1950s, and incidences of ECT's use as a form of punishment for "difficult" patients like the scenes in *Cuckoo's Nest* did occur, though it is not clear that this was a widespread phenomenon.[16] There were also rare instances of ECT's use in attempts to treat homosexuality, considered to be a psychiatric illness at the time.[17] ECT's development certainly had its share of regretful medical history.

Even as ECT became safer, several factors arose as obstacles to its widespread adoption that explain its decreased use in present day compared to the 50s and 60s. One was the development and heavy marketing of antidepressant drugs through the 1960s by pharmaceutical companies that increasingly gained

influence over psychiatric training.[11,13] Another was the movement of "anti-psychiatry" that arose in the 1960s, led by sociologists, philosophers, and even psychiatrists. In its extremes, the movement rejected the idea of mental illness as a true disease, arguing instead that it was a social construct used to marginalize those who deviated from predominant social norms. Not least of all, lobbying efforts for anti-ECT legislation in the 1970s were championed by a handful of people who had either experienced ECT without anesthetic or who had suffered severe cognitive impairment as an adverse effect. Their efforts found some success. In 1974, Governor Reagan signed a bill (AB 4481) highly restricting the use of ECT in California; this was later replaced by a less restrictive bill (AB 1032). In 1982, citizens of Berkeley approved a bill to make use of ECT in city hospitals punishable by $500 fine; this was later reversed. In 1993, Texas banned the use of ECT on patients under 16 years old and increased regulations on reporting requirements.[11] All together, these events contributed to a drop in the 1980s numbers for patients treated by ECT to a tenth of what they had been in the 1950s and 60s.[18] Efforts by the American Psychiatric Association Task Force and Association for Convulsive Therapy to challenge anti-ECT legislation as well as standardize informed consent and training around ECT use have since helped partially reverse the trend.[11]

Today, the persistence of controversy around ECT centers around what is now its most likely adverse effect, memory loss. Since its inception, refinements in the technique of ECT (including the frequency and number of treatments, form and delivery of electrical stimulus, etc.) have greatly decreased memory and cognitive effects.[5,11] Currently, the most common side effects are disorientation immediately

following treatment that is characteristic of a postictal seizure state, an inability to retain memories made during and shortly after treatment, and short-term memory loss that may involve the weeks and months leading up to the treatment. Most patients experienced an improvement in adverse symptoms over time, and research has found that ECT applied to only one side of the head is associated with less lasting memory impacts than ECT applied across both sides. One patient reported that he could not recall a trip to China he had made 8 months before his ECT treatments, but he "didn't care because he had not felt this well in years." Over the next 6 months, his memory loss improved. Profound, persistent memory loss is a side effect that has been reported in rare instances, including by prominent public figures like actress Carrie Fisher and Vermont State House of Representatives member Anne Donahue. While expressing no personal regrets about having undergone treatment, both women endorsed serious memory loss.[5,17]

While much remains to be answered about technical aspects and scientific mechanisms of ECT, the story of ECT's invention and development contains many lessons about the ethical questions and cultural forces surrounding medical advancement. In it, we find reminders that at any moment, breakthroughs may redefine our perception of the limits of medicine, and a keen sense of observation is often the vehicles of these discoveries. We find that trust lost from the general public is difficult to regain, and the impacts of things we do to our patients may continue to impact the public consciousness, policy, and the practice of medicine long afterwards. We are challenged to answer the question of how to respect the human dignity of patients who may not have the mental faculties to consent to

treatments of unknown risks and unrealized potential. We are even asked to reexamine our beliefs about what constitutes as mental illness. Lastly, the medical community must grapple with whether it wishes for the tragic side of ECT's history to fade from public consciousness (in the way that chemotherapy is rarely remembered for its origin as a weapon of warfare), or if there is a way to remember the lessons of the past while we encourage our patients get help.

Resources

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