

**Chapter 1 : Electroconvulsive Therapy**

*Electroconvulsive Therapy. Article by John R. Lipsey, MD, Associate Professor, Psychiatry, The Johns Hopkins University School of Medicine Article by John R. Lipsey, MD, Associate Professor, Psychiatry, The Johns Hopkins University School of Medicine.*

The Electroconvulsive Shock Therapy To Know More The early decades of the 20th century witnessed a major revolution in the understanding and treatment of mental diseases. Until then, people with psychoses were usually locked away in insane asylums, receiving only limited custodial care and sometimes social support, with practically no effective therapeutic options left to the alienist, as psychiatrists were called then. Although well-intentioned medical reformers such as Phillippe Pinel eased the nightmarish conditions of insane asylums in force well into the first half of the 19th century, no treatments were generally performed. The first revolution was put in motion by scientific psychotherapy, based on theories of the mind proposed by Austrian physician Sigmund Freud , the founder of psychoanalysis. Its value was mainly observable in mild mental disturbances, particularly neuroses. But beginning in the s these methods began to be supplemented by physical approaches using drugs, electroconvulsive therapy, and surgery. The knowledge that head trauma, convulsions and high fever could be good for improving mental disturbances is not new in Medicine. Hippocrates was the first to note that malaria-induced convulsions in insane patients was able to cure them. In the Middle Ages, some physicians observed the same phenomenon after a severe bout of fever; such as after cholera epidemics in insane asylums. In , a physician named Roess claimed improvement in mental patients after inoculation with smallpox vaccine. Furthermore, many physicans along the centuries have noted that there are very few epileptics who are also schizophrenic, and a biological theory on the incompatibility of convulsions and mental disease slowly evolved. In addition, for centuries physicians had been fascinated with the idea of treating mental and neurological diseases by using electricity. Between and , four methods for producing physiological shock were discovered, tested and used in the psychiatric practice, all of them in Europe: Malaria-induced fever , to treat neurosyphillitic paresis, discovered in Vienna by Julius Wagner-Jauregg , in ; Insulin-induced coma and convulsions , to treat schizophrenia, discovered in Berlin by Manfred J. Sakel , in ; Metrazol-induced convulsions , to treat schizophrenia and affective psychoses, discovered in Budapest by Ladislaus J. The advent of treatment of the psychoses by using physiological shock increased the opposition between two schools of thought within psychiatry: This school was typified by psychoanalysis, founded by Sigmund Freud in the beginning of the 20th. Consequently, the approaches to therapy by each school were markedly different. The success of shock therapy, which was evidently due to some drastic alteration in the internal environment of the brain and on the functions of the neural cells, was a strong argument in favor of the biological causation of many mental diseases. Fever and Mental Disease The first researcher to systematically pursue the link between fever and mental disease was the Austrian physician Julius Wagner von Jauregg. He observed that insane patients improved considerably after surviving to severe typhoid fever, erisipella or tuberculosis infections. Impressed by the coincidence that all of these patients had episodes of high fever and inconscience, he started to do experiments with many methods of inducing fever, such as infection by erisipella, injections of tuberculin, typhoid, etc. Paresis, also called dementia paralytica, was an incurable and almost always fatal disease, and the insane asylums were full with patients with it, due to the inexistence of effective treatments for syphillis. It was accompanied by marked and progressive neurological and mental degeneration, including convulsions, ataxia motor incoordination , speech deficits and general and widespread paralysis. Mentally, it caused mania, depression, paranoia and violent behavior, including suicide, delusions, loss of memory, disorientation, and apathy. The breaktrough was inspired by a startling series of medical discoveries in microbiology, In , Ronald Ross had discovered in India that malaria was caused by a parasite transmitted by the Anopheles mosquito. In , Schaudinn, in Germany, discovered the pathogenic agent for syphillis, the Treponema pallidum. In the same year, Karl Landsteiner proved that fever was able to kill the syphillis-causing spirochetes. In the next year, Wassermann discovered the sorological test for syphillis which is used to detect the infection very early, and in it was used for the first time for testing the

cerebrospinal fluid. In , after attempts at the chemotherapy of syphilis, Paul Ehrlich achieved success with salvarsan or the "Compound", on the basis of arsenic, which was the first scientifically designed substance to be used against microbes. Finally, in , Noguchi and Moore demonstrated that general paresis was in fact an infection of the nervous system by syphilis, and this was the first time in medical history that a kind of mental disturbance, or madness, could be traced to a biological alteration of the brain! The "biological" school of psychiatry had scored a tremendous victory. Wagner-Jauregg, who was keen in noting every association between fever and paresis, inoculated in July nine chronic paresis patients with the tainted blood of a malarial soldier. He achieved complete recovery in four of these patients and an improvement in two more. He then proceeded to devise and to test a complex treatment protocol in syphilitic patients who were at risk for paresis. First he tested their blood and CSF with the Wassermann reaction, then treated them with malarial blood, followed by quinine to quench malaria and alternating with injections of neosalvarsan, to clear the blood of spirochetes. His success rate was remarkable: For this, Wagner-Jauregg was awarded the Nobel Prize in .

**The Insulin Shock Therapy**

The second breakthrough in the shock treatment of psychosis was achieved in by a young Polish neurophysiologist and neuropsychiatrist named Manfred J. While an internist in the Lichtenfelde Hospital for Mental Diseases, in Berlin, Germany, he provoked a superficial coma in a morphine-addicted woman, using an injection of insulin, and obtained a remarkable recovery of her mental faculties. The lack of insulin causes diabetes, or hyperglycemia excess of glucose , while its natural or artificial excess causes hypoglycemia, which leads to a coma and to convulsions, due to the deficit of glucose in the brain cells. The official communication of his technique was made on September , and was enthusiastically received. Until then, no biological treatment for schizophrenia was available. This was to be one the most important contributions ever to be made to psychiatry. Two large studies carried out in the USA in and gave him fame and helped his technique to rapidly spread out around the world. Initial enthusiasm was followed by a decrease in the use of insulin coma therapy, after further controlled studies showed that real cure was not achieved and that improvements were many times temporary.

**Chemical Convulsions and Schizophrenia**

In , in the same year that Sakel announced officially his results with the insulin coma therapy, a young Hungarian physician named Ladislaus von Meduna , working at the Interacademic Institute of Psychiatric Research, in Budapest, started what would become an entirely new approach to physiological shock in the treatment of mental disease. Meduna reasoned, then, that "pure" artificially induced epileptic convulsions could be able to "cure" schizophrenia. He then began testing several kinds of convulsant drugs on animals and then on patients. His goal was to achieve completely controllable and reproducible convulsions. The first substance he tested, in , was camphor, but the results were not reliable. He tested also strychnine, thebain, pilocarpin and pentilenetetrazol also known as metrazol, or cardiazol , always injecting them intramuscularly. Sakel had used many of these drugs together with insulin, in order to enhance the convulsions, but never alone. Convulsions ensued quickly and violently, and were dose-dependent. From this point on, two camps were firmly established in relation to physiological shock therapy: Metrazol was cheaper, much easier to use and more reliable to induce convulsions. Insulin coma required five to nine hours of hospitalization and close follow-up, but it was easily controlled and stopped with injections of glucose or adrenalin, when needed. Metrazol was stronger and more difficult to control. Meduna was also forced to immigrate to Chicago, in the USA, in , and from there he continued his research on metrazol convulsions. Eventually, psychiatry recognized that his theory of biological incompatibility between epilepsy and schizophrenia was unfounded, but that artificially-induced convulsions were useful to reduce schizophrenia. Bennett, a psychiatrist, combined metrazol injections with curare to neutralize the strong muscle contractions which were responsible for this and other incidents. Curare is a muscle paralyzing agent which is extracted from South American plants used by Indians to make poison darts and arrows. It occupies the nerve receptors in muscles, blocking the normal action of acetylcholine neurotransmitter released by motor cells at that point. Later, scopolamine was also used in conjunction with metrazol and curare, to sedate the patient and to avoid the terror of being subjected to violent convulsions while conscient this was an advantage of insulin. However, in controlled trials, metrazol seemed to be far less efficient than insulin in the treatment of schizophrenia, particularly chronic disease. Furthermore, they were highly feared by the patients. Cerletti knew that an electric shock across the head

produced convulsions, because as a specialist in epilepsy, he had done experiments with animals on the neuropathological consequences of repeated epilepsy attacks. In Genoa, and later in Rome, he used an electroshock apparatus to provoke repeatable, reliable epileptic fits in dogs and other animals. The idea to use ECT in humans came first to him by watching pigs being anesthetized with electroshock before being butchered, as a kind of anesthesia, and so he convinced two colleagues, Lucio Bini and L. Kalinowski a young German physician to help him in developing a method and an apparatus to deliver brief electric shocks to human beings. They first experimented with several kinds of devices and animals, until determining the ideal parameters and perfecting the technique, and then followed up with a series of electroshocks in human subjects with acute-onset schizophrenia. After 10 to 20 ECT shocks in alternate days, the improvement in most of the patients were startling. One of the unexpected benefits of transcranial electroshock was that it provoked retrograde amnesia, or a loss of all memory of events immediately anterior to the shock, including its perception. Therefore, the patients had no negative feelings towards the therapy, as it happened with metrazol shock. Furthermore, ECT was more reliable and controllable and less dangerous to the patient than metrazol. Soon, curare and scopolamine were being used in conjunction with ECT, and gradually it replaced metrazol and insulin-induced shock. ECT was to begin its long journey as the shock therapy of choice in the majority of hospitals and asylums around the world. Results were mixed, and they were all abandoned in favor of ECT, cheaper and more reliable. Significant improvements in the technique of ECT have been made since then, including the use of synthetic muscle relaxants, such as succinylcholine, the anesthesia of patients with short-acting agents, pre-oxygenation of the brain, the use of EEG seizure monitoring and better devices and shock waveforms. Despite these advances, the popularity of ECT greatly decreased in the 1950s and 1960s, due to the use of more effective neuroleptics and as a result of a strong anti-ECT movement, as we will see below. Many important personalities were subjected to shock therapy. The Reaction Against ECT As it happened with psychosurgery, electroconvulsive therapy was a highly troublesome therapy. First, there were many examples of ECT being used to subdue and to control patients in psychiatric hospitals. Troublesome patients received several shocks a day, many times without proper restraint or sedation. Together with psychosurgery, ECT was denounced by libertarians, and the most famous libel was a novel written by Ken Kesey, based on his experiences on an Oregon mental hospital. Bad press turned into a series of legal actions involving the abuses of shock therapy. By the mid-1960s ECT had fallen into disrepute. Psychiatrists increasingly made use of powerful new drugs, such as thiorazine and other antidepressives and antipsychotics.

## Chapter 2 : Psychiatric aspects of neurologic diseases : practical

*Management for electroconvulsive therapy of a patient with inoperable coronary artery disease and ankylosing spondylitis Douglas S. Snyder, John R. Lipsey, Robert W. McPherson School of Medicine.*

## Chapter 3 : John R Lipsey " Research Output " Johns Hopkins University

*Case Reports Management for Electroconvulsive Therapy of a Patient with Inoperable Coronary Artery Disease and Ankylosing Spondylitis Douglas S. Snyder, MD, MS,\* John R. Lipsey, MD,t Robert W. McPherson, MD\* Department of Anesthesiology and Critical Care Medicine,,Johns Hopkins University School of Medicine, Baltimore, MD.*

## Chapter 4 : - NLM Catalog Result

*Electroconvulsive Therapy John R. Lipsey Psychotherapy Susan W. Lehmann Nonpharmacologic Interventions Other Than Psychotherapy Constantine G. Lyketsos*

## Chapter 5 : The History of Shock Therapy in Psychiatry

*John R Lipsey. Assoc Professor. Management for electroconvulsive therapy of a patient with inoperable coronary artery*

*disease and ankylosing spondylitis.*

#### **Chapter 6 : Information about Electroconvulsive Therapy in the Internet**

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#### **Chapter 7 : Publications Authored by Samuel Wilkinson | PubFacts**

*A year-old male with severe coronary artery disease, ankylosing spondylitis, and severe major depression was scheduled for electroconvulsive therapy (ECT). The patient had previously failed or proved intolerant of antidepressant drug therapy.*

#### **Chapter 8 : Publications Authored by Samuel T Wilkinson | PubFacts**

*Dundalk Maryland Psychiatrist Doctors physician directory - Learn about electroconvulsive therapy (ECT) for depression as an alternative treatment option for patients who are unresponsive to antidepressant medications.*

#### **Chapter 9 : Psychiatric Aspects of Neurologic Diseases : Phillip R. Slavney :**

*There have been few reports of electroconvulsive therapy (ECT) for patients with cardiac pacemakers and none in Britain. The effect of the ECT current on the pacemaker and the possibility of.*