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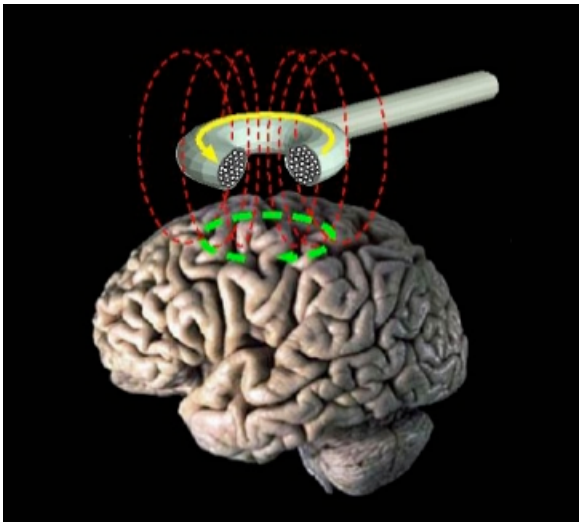
Transcranial Magnetic Stimulation

The concept behind transcranial magnetic stimulation(TMS) is strait forward and simple. A magnetic coil is used to stimulate the neurons in the brain in order to alleviate headache “aura” or migranes. Headache “aura” is when headaches occur from such events as flashing lights or strobe lights.

The complete setup consist of plexiglass encased circuitry and a copper magnetic coil. Within the plexiglass box there is a twenty four volt power supply, a battery of condensers, a snubber circuit, and control circuits. The power supply charges up the condensers (about 20-30 seconds) and then discharges them when the technician chooses via a button. The control circuit was used as a high voltage double pole inverter. In short this allowed for a sine wave to be produced. A snubber circuit was designed and added in between the coils and the condensers as a result of lag time. The lag time initially would produce a negative current through the coil, which was undesirable.

As the coil produces a magnetic field at the scalp, the nearby neurons in the brain are modulated. The modulation affect is important to how the TMS functions because headache aura and migraines are associated with excitation of cortical neurons in the frontal lobe. This treatment can also be used to treat depression as it can modulate electrically unexcited(depressed) area. The treatment will stimulate the unexcited electrons and eliminate depression.

The future for this product appears to be promising given that twenty percent of the population suffers from migraines. Another positive is that the treatment for migraines and depression is noninvasive, as the coil is simply placed on the scalp. Treatment is also relatively quick requiring at maximum an hour of repeated stimulation at set intervals. Once TMS is widely accepted as a treatment, insurance will cover TMS treatments and procedures.



http://intra.ninds.nih.gov/images/Research_Images/wassermanne@ninds.nih.gov.jpg

http://www.mclean.harvard.edu/patient/adult/tms.php

http://en.wikipedia.org/wiki/Transcranial_magnetic_stimulation

http://www.nami.org/Content/ContentGroups/Helpline1/Transcranial_Magnetic_Stimulation_%28rTMS%29.htm

- **Design and Construction of a Portable Transcranial Magnetic Stimulation (TMS) Apparatus for Migraine Treatment:** Anne Beuter, Isabelle Lagroye, Bernard Veyret University of Bordeaux 1,IMS, Site ENSCPB,UMR CNRS 5218,16, Avenue Pey Berland, 33607, Pessac Cedex, France