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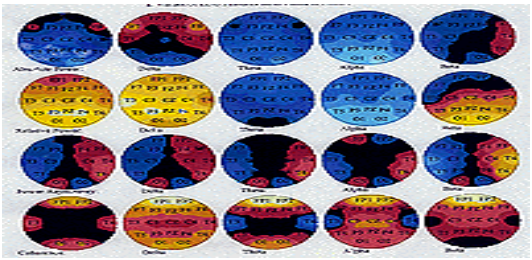
Neurofeedback

Neurofeedback is a form of biofeedback in which brain waves are observed and analyzed to allow a patient to self-regulate their brain activity. Through this regulation, one is able to train their brain to naturally function as desired. This is based on the principals of how the brain works. When the brain wants to communicate to itself or other parts of the body, it uses its nerve cells which produce signals that are called action potentials. These signals can be measured as a very small voltage and each kind of signal has a specific frequency. Theta brain waves (4-7 Hz) are responsible for trance like states, while beta waves (12-38 Hz) are present during conscious thinking.

These electrical voltages enter the membranes surrounding the brain and continue up through the skull and appear at the scalp. By placing electrodes on the surface of the scalp, these voltages and frequencies can be amplified and analyzed to show how the brain is working. Using a machine called a QEEG (Quantitative Electroencephalographer), and a series of 24 electrodes placed around the head, a map of the brain can be obtained.



After comparing a patients map with that of a normal person, a doctor can determine which section of the brain is not working properly.

When a child is born there are roughly 250,000 neural connections that are available. As the child grows these connections may be inhibited or they may not be activated properly. The QEEG will show which section of the brain is producing the wrong waves. Once the problem is identified, an EEG can be used to target the specific section of the brain. It is not to late for the brain to naturally produce the correct waves. The brain plasticity concept states that neural connections can produce new connections based upon a process called synaptic reorganization.

To achieve this, an electrode is placed on the target section and the resulting readings are fed into a computer. Researchers at NASA have developed software which takes in the readings and allows the patient to instantly see what their brain is doing. Ordinarily, we cannot influence our brainwave patterns because we lack awareness of them. However, when you can see your brainwaves on a computer screen a few thousandths of a second after they occur, it gives you the ability to influence and change them. Video games have been altered for kids to help with this process. When they make their brain produce the correct waveforms they perform better in the game. This trains their brain to naturally produce these signals.

This technique can treat many problems such as, specific learning disabilities, anxiety and panic attacks, autism, depression, Asperger's Syndrome, sleep disorders, addictions and most commonly ADD / ADHD. Ninety percent of kids with ADD show an abnormal QEEG reading. When given academic tests, the brain of children with ADD tend to produce more theta waves and less beta. In order to concentrate and learn at peak performance, your brain needs to emit a high level of Beta waves. With 40 half hour sessions, approximately 50% of ADD/ADHD trainees lose all the symptoms. With 60 half hour sessions, approximately 85% of ADD/ADHD trainees lose all of the symptoms. Neurofeedback is a drug free permanent solution to ADD as opposed to current treatments such as ritalin. Typical costs for 60 half hour training sessions for ADD /ADHD/ autism runs from $3000 to $10,000. However, a home unit can be rented for only 300 dollars a month.

Re-training the Brain: Using neurofeedback to help individuals with Autism Spectrum Disorder. Laurence M Hirshberg Ph D. Aspergers Digest, June 2004.
Neurofeedback in Psychological Practice. Frank Masterpasqua and Kathryn Healey of Widener University.
Neurofeedback: QEEG based - http://home.iprimus.com.au/rboon/NeurofeedbackQEEGbased
MedlinePlus: EEG - http://www.nlm.nih.gov/medlineplus/ency/article/003931.htm
Brain lobes - http://www.driesen.com/brain_view_-_2.htm
NDC neurofeedback - http://www.neurodevelopmentcenter.com/
QEEG brain mapping - http://www.crossroadsinstitute.org/brainmap.html