QEEG Subtypes and Neurofeedback for ADHD and Autistic Spectrum Disorders

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QEEG has its foundation in ADHD Theta/Beta ratios (Lubar, Monastra, Linden) and then identification of subtypes of ADHD. The Theta/Beta ratio was found to have 93% specificity and be more than 90% reliable in identification of ADHD in children through young adults. In 1996, researchers identified subtypes of ADHD that were correlated with differential treatment responses to medications and assisted in selecting more specific treatment protocols for Neurofeedback.

Neurofeedback has been most extensively researched and performed with ADHD (Lubar, Linden). Neurofeedback with ADHD students resulted in higher IQ scores and has been found to have increased effectiveness without side effects compared to medication (Monastra, AAPB). Neurofeedback can be individualized to specific locations and frequencies in order to improve success rates and minimize side effects.

QEEG research identified six subtypes of ASD, including abnormal EEG activity (seizures), fast high Beta and both hypo and hypercoherence patterns (Linden, Coben). This has led to improved identification of Autism and Aspergers and significant improvements in communication, behavior and socialization (Coben, Linden).

QEEG and Neurofeedback for Detection and Treatment of Concussions, TBI and Dementia

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Within the sport concussion literature, there has been a call for more precise and accurate methods for diagnosing an injured athlete who may have suffered a concussion during competition or in off-field activities. Thankfully, research on the use of qEEG (Quantitative Electroencephalography) with patients with head injuries has (Duff, 2004) demonstrated reliable and measurable physiological markers that are associated with sport-related concussion. The research has shown that the qEEG map is the most sensitive type of brain imaging test for identifying post-concussion syndrome, detecting a concussion with 96 percent accuracy up to four months after injury, and it can track the impact of repeated injuries over multiple years' time.
Recent studies have been showing Neurofeedback and direct Neurofeedback are successful for treating concussions and TBI.. Neurofeedback for concussions and TBI can be individualized for each person and each specific head injury based on brain location, imbalance (frequency [speed], amplitude [energy], and coherence [connectivity]).

QEEG and Neurofeedback for Addiction and PTSD

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Neurofeedback treatment of addiction can be traced back to the 1970's started with Joe Kamya, (Kamya & Noels, 1970) who established that the alpha rhythm can be operantly conditioned. With the clinical observation that alcoholics tend to be deficient in alpha and that drinking temporarily increased alpha, researchers began to hypothesize that alpha training could be a treatment for alcoholism. In the late 1980's the seminal work by Penniston and Kulkosky (Penniston & Kulkosky, 1989) demonstrated that alpha-theta brainwave training combined with preconstructed visualizations could produce remarkable results. Single channel alpha-theta training remains a viable treatment option today, but now advanced technology has given us the ability to do multichannel training of the addiction network as well as other networks in the brain.
Post-Traumatic Stress Disorder can also be treated by alpha-theta training, but recent research offers promising rapid resolution results with combat veterans. In addition to neurofeedback, a form of acoustical neuromodulation called BAUD assisted RESET therapy can break up and reset trauma circuits in the brain. QEEG mapping shows dramatic differences between a resting baseline and

when the patient focuses on trauma recall. Following RESET treatment there is no distinguishable difference between baseline and trauma focus. (Linenfold & Rozelle, 2015)

QEEG, ERP and Neurofeedback for Epilepsy and Sleep Disorders

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AED and surgical options are the standard treatments for epilepsy. However, about one-third of patients with epilepsy do not respond to anti-epileptic drugs (AED). Of the patients who are prescribed AED a considerable percentage are left being drug resistant. The majority of these treatment resistant patients suffer from focal seizures. Especially for these seizure patients feedback of brain activity (EEG-feedback, mostly called neurofeedback) has been developed and evaluated over the past three decades. In addition, the research has been found in two independent research groups. A decrease of seizures after enhancement of the sensory motor rhythm in patients with poorly controlled epilepsies was reported in 1972 for the first time (Sterman and Friar, 1972). It was concluded that SMR-training decreased seizure susceptibility. Protocols for increasing SMR-activity and in some studies decreasing slow rhythms (delta and theta) of EEG have been used in the following years for research and practice mainly in the United States (for a review see Tan et al., 2009). In parallel to this development, Rockstroh et al. (1993) were able to reduce seizures after feedback of slow cortical potentials (SCPs). Investigations of neurofeedback and sleep disorders have chiefly focused on combating insomnia. Studies demonstrate that neurofeedback reduced the amount of sleep onset latency and that it improves the quality of sleep. This is especially true for patients with Attention Deficit Hyperactivity Disorder (ADHD). The sleep improvements apparently lead to a corresponding reduction in the inattention common to people with ADHD.