



## **ADHD Alternative to Medication is Rated Efficacious and Specific, the Highest Clinical Research Level**

There is an evidence-based alternative to methylphenidate for children and adults who suffer from ADHD. It is called EEG biofeedback, or neurofeedback, and it has been rated as having a "Level 5 research outcome". Level 5, the highest possible clinical research level, indicates that EEG biofeedback is "Efficacious and Specific" when used to help individuals who have attention deficit disorder (ADD) or its cousin attention deficit hyperactivity disorder (ADHD). In other words, the outcomes when using neurofeedback for ADD and ADHD have been shown to be statistically significant as compared to prescription drugs or groups using a placebo treatment. By contrast, a "Level 1 research outcome" is supported only by personal stories or case studies in non-peer reviewed publications.

In order for EEG biofeedback to be rated as "Efficacious and Specific" for ADHD, it required multiple studies with the same statistically significant outcomes. A meta-analysis was performed on collected research on neurofeedback treatment for ADHD and was published in the Journal of Clinical EEG and Neuroscience in 2009.

"In line with the guidelines for rating clinical efficacy, we conclude that neurofeedback treatment for ADHD can be considered 'Efficacious and Specific' (level 5) with a high effect size for inattention and impulsivity and a medium effect size for hyperactivity."

One of the smaller, yet very impressive studies (n=20) used functional magnetic resonance imaging or fMRI to measure the effect of EEG biofeedback on the brains of children with ADHD. None of the children chosen were taking or had taken psychostimulant drugs such as Ritalin, Strattera or Adderall. Nor had any of the children undergone cognitive training before the study. Children enrolled in the study were randomly assigned to the experimental group who received neurofeedback, and the other children were assigned to the Control group and didn't receive EEG biofeedback training. Subjects from both groups were scanned using an fMRI one week before beginning neurofeedback and one week after the end of neurofeedback training. The fMRI was performed while they were performing an attentional task. In addition, performance tests (Digit Span, the IVA, and the CPRS-R) were administered one week before the beginning of neurofeedback and one week after neurofeedback. The results of the study suggested that in ADHD children, EEG biofeedback has the capacity to normalize the functioning of the anterior cingulate cortex or ACC, the key area in the brain associated with selective attention. In other words, the fMRI showed structural changes in the brain as it improved its self-regulation.

Replicated studies suggest that the groups who have successfully improved their ADHD symptoms will continue to enjoy those benefits long after the training is over. Other issues that have shown statistically significant improvement in studies include: addiction, depression, pain, affective disorders, learning disabilities, Asperger's, migraines, epilepsy, memory, Post Traumatic Stress Disorder (PTSD) and traumatic brain injury (TBI).