

# Neurobiofeedback (NF) and ADHD

- Recently two important studies on neurobiofeedback and ADHD have been done in Germany.
- The first study was a standard randomized control study. The second one was a 6 month follow up study of the subjects in the first study.
- There are some concerns about both studies because the study was not double-blind.

# Neurobiofeedback (NF) and ADHD

The researcher of these studies wrote:

“”A reduction of at least 25% in the primary outcome measure (responder criterion) was observed in 50% of the children in the NF group. In conclusion, behavioural improvements induced by NF training in children with ADHD were maintained at a 6-month follow-up. Though treatment effects appear to be limited...NF may be recommended as a treatment module for children with ADHD besides conventional and behavioural training and medication.” (p. 715 and 722) (May, 2010 article)

# Neurobiofeedback (NF) and ADHD

- Gevensleben, H., Holl, B., Albrecht, B., Vogel, C., Schlamp, D., Kratz, O., Studer, P., Rothenberger A., Moll, G.H., and Heinrich, H. (July, 2009). Is Neurobiofeedback an Efficacious Treatment for ADHD? A Randomized Controlled Clinical Trial. Journal of Child Psychology and Psychiatry, 50 (7), p. 767-768.
- Fisher, C. (February 20, 2009). Children with ADHD Realize Significant Benefits From Neurofeedback Training In a Randomized Clinical Trial. The Behavioral Medicine Report. From website: [www.bmedreport.com/archieves/1037](http://www.bmedreport.com/archieves/1037).

# Neurobiofeedback (NF) and ADHD

- Gevensleben, H., Holl, B., Albrecht, B., Vogel, C., Schlamp, D., Kratz, O., Studer, P. Rothenberger A., Moll, G.H., and Heinrich, H. (May, 2010). Neurofeedback Training in Children with ADHD: 6-Month Follow-up of a Randomized Control Trial. European Child and Adolescent Psychiatry, 19, 715-724.

# Neurobiofeedback and ADHD

## NIMH Pilot Study of Double-Blind Randomized Control Neurobiofeedback Use with ADHD:

- Conducted at the Nisonger Center at Ohio State University
  - Gene Arnold and Nicholas Lofthouse, primary investigators
  - Used Smartbrain Neurobiofeedback Technology
  - 39 ADHD, 6 to 12 year olds randomly assigned to two groups: (1) Sham Control and (2) Treatment

Abranwitz, A. , Lofthouse, N., deBeus, R., Hirshberg, L., and Barkley, R. (November 12, 2010). EEG Neurobiofeedback for ADHD: Review of Science, New Findings. Paper and Symposium presented at the 22<sup>nd</sup> Annual CHADD Conference, Atlanta, GA, Session FD10.

# Neurobiofeedback and ADHD

## NIMH Neurobiofeedback Pilot Study Results:

- Retention rate 24 sessions 92%; 40 sessions 87%
- Three treatments per week tolerated best
- Twenty-four session optimal number

**Abranwitz, A. , Lofthouse, N., deBeus, R., Hirshberg, L., and Barkley, R.**  
**(November 12, 2010). EEG Neurobiofeedback for ADHD: Review of Science,**  
**New Findings. Paper and Symposium presented at the 22<sup>nd</sup> Annual CHADD**  
**Conference, Atlanta, GA, Session FD10.**

# Neurobiofeedback and ADHD

## NIMH Pilot Study Results (Continued):

- No difference between treatment and sham control groups in parent and teacher ratings for ADHD, hyperactive/impulsive symptoms, inattentive symptoms, Oppositional Defiant symptoms, and executive function symptoms.
- The treatment group saw no change in their theta-beta ratios.

**Abranwitz, A. , Lofthouse, N., deBeus, R., Hirshberg, L., and Barkley, R. (November 12, 2010). EEG Neurobiofeedback for ADHD: Review of Science, New Findings. Paper and Symposium presented at the 22<sup>nd</sup> Annual CHADD Conference, Atlanta, GA Session FD10.**

# Neurobiofeedback and ADHD

## **NIMH Pilot Study Results (Continued):**

- **Barkley stated after hearing the above data regarding what clinicians should say to clients interested in pursuing neurobiofeedback as a treatment for ADHD:**
- **“The status of the evidence does not allow a recommendation to be made (sic. For neurobiofeedback).**
- **The clinician should give the information, but not render a suggestion. Allow the client to use their own informed consent.**

**Abranwitz, A. , Lofthouse, N., deBeus, R., Hirshberg, L., and Barkley, R. (November 12, 2010). EEG Neurobiofeedback for ADHD: Review of Science, New Findings. Paper and Symposium presented at the 22<sup>nd</sup> Annual CHADD Conference, Atlanta, GA, Session FD10.**



# Neurobiofeedback and ADHD

Barkley (continued):

- The neurobiofeedback studies that have shown treatment responses indicate the effect size of the treatment is far lower than that of medication for ADHD.
- It has an effect size of other psychosocial treatments for ADHD (i.e., parent training, classroom management, etc.)

**Abranwitz, A. , Lofthouse, N., deBeus, R., Hirshberg, L., and Barkley, R. (November 12, 2010). EEG Neurobiofeedback for ADHD: Review of Science, New Findings. Paper and Symposium presented at the 22<sup>nd</sup> Annual CHADD Conference, Atlanta, GA Session FD10.**

# Recent Review of Neurobiofeedback Research Results with AD/HD

- Based on the results and methodologies of published studies, this review concludes that NF for pediatric ADHD can be currently considered as “probably efficacious.”

Lofthouse, N, Arnold, E., Hersch, S. Hurt, E., and DeBeus, R. (November 16, 2011). A Review of neurobiofeedback Treatment for Pediatric ADHD. Journal of Attention Disorders. doi: 10.1177/1087054711427530 .

# Recent Review of Neurobiofeedback Research Results with AD/HD

**According to Rabiner (January 2012). The “probably efficacious” rating of the American Psychological Association is the third highest rating out of a potential 5 levels research can obtain with 5 being the highest. “Probably efficacious” means the research in question has, “Shown to produce positive effects in more than one clinical, observational wait list or within-subject or between-subject study. When writing regarding the Lofthouse study (November 16, 2011). Rabiner stated, “When averaged across the studies for which appropriate outcome data was available, the overall mean effect size (ES) was .79 for inattention measures, and .71 for hyperactivity/impulsivity measures...”**

# Recent Review of Neurobiofeedback Research Results with AD/HD

**“...These are in a range that would be considered 'large' for inattention and 'moderate' for hyperactivity/impulsivity and are below what is typically reported for stimulant medication. Five of the studies showed neurophysiological changes that were specific to neurofeedback treatment. Overall, these results are consistent with beneficial effects of neurofeedback treatment for ADHD.”**

**Rabiner, D. (January, 2012). New Review of Neurobiofeedback Treatment for ADHD-State of the Science. Attention Research Update. E-mail newsletter: [attentionresearchupdate@helpforadd.com](mailto:attentionresearchupdate@helpforadd.com).**