

## FROM THE EDITORS

# Special Issue: Advances in the Use of QEEG and Neurofeedback for ADHD

Editor in Chief: Donald Moss, PhD, BCB, BCN

Guest Editors: Rex Cannon, PhD, Robert Thatcher, PhD, J. Lucas Koberda, MD, and Jay Gunkelman, QEEG-Diplomate

*The cover of this special issue shows a three-dimensional graphic of a brain depicting the “reward network” as a target for biofeedback intervention. The article by Robert Thatcher in this issue discusses the use of functional network analyses and a Z-score approach to selectively target a network of brain areas for training. (The editors are grateful to Dr. Thatcher for this graphic.)*

### Professional Issues

Cynthia Kerson provides a second article in her series on the foundations that support research and study in biofeedback and neurofeedback. Here she interviews Paul Lehrer, the Chair of the AAPB Foundation for Education and Research in Biofeedback (FERB). Dr. Lehrer discusses the current state of research in biofeedback and neurofeedback and reviews the efforts of FERB to support graduate students' research as well as students' attendance at the AAPB meeting. Lehrer also discusses opportunities for collaboration between the ISNR Research Foundation and FERB.

Fredric Shaffer, the Chair of the Biofeedback Certification International Alliance (BCIA), provides a reflection on some of the choices facing nonprofit boards. This article includes discussion of the recent BCIA Board decision to transition to a self-governance status.

### Special Issue Articles: Advances in the Use of QEEG and Neurofeedback for ADHD

Attention-deficit hyperactivity disorder (ADHD) is a serious and chronic problem, affecting approximately 11% of American children and adolescents, according to recent figures from the Centers for Disease Control and Prevention (2011). At least half of children with ADHD continue to suffer symptoms of inattention in adult years, hindering career and social adjustment (Centers for Disease Control and Prevention, 1999).

The present special issue focuses on newer developments in the use of quantitative electroencephalography (QEEG) and low-resolution brain electromagnetic tomography (LORETA) for assessment in ADHD. In addition, this issue reports on advances in using both QEEG- and LORETA-guided feedback to target treatment more precisely, to accomplish changes in neural processing more effectively, to accomplish sharper and more delineated change in brain function, and to potentially use fewer training sessions.

Rex Cannon provides an article overviewing the use of LORETA in assessment to identify brain surfaces on the surface of the cortex and below (Brodmann areas) contributing to the deficient brain function in ADHD. He then describes the use of LORETA-guided neurofeedback to normalize the function in the targeted brain centers. Cannon presents a study of eight patients with ADHD, ages 7 to 17 years, treated with LORETA-guided neurofeedback. The eight patients showed both functional and symptomatic improvements, including verbal fluency and attentiveness on a continuous performance measure.

Robert Thatcher provides an article on neural networks identified in ADHD and the efforts to modify those networks through targeted neurofeedback. He describes the relationship between an attention network and the default mode network. Thatcher introduces the use of LORETA-assisted QEEG in assessment of ADHD and the use of LORETA Z-score-guided neurofeedback to modify brain function in specific Brodmann areas as well as in the connections among them.

J. Lucas Koberda provides an additional article on LORETA Z-score neurofeedback in patients with cognitive deficits and attention deficit. He includes a case study on an 8-year-old boy with ADHD and significant learning and behavioral difficulties. Baseline LORETA showed abnormal activation in the anterior cingulate, and baseline QEEG showed excessive beta activation frontally and centrally.

The child underwent computerized neurocognitive assessment, followed by neurofeedback including both surface cortical feedback and LORETA-guided neurofeedback. Posttreatment, he showed marked improvement in neurocognitive testing, reductions in the excessive beta, and normalization of activation in the anterior cingulate.

Jay Gunkelman reviews the use of QEEG assessment to refine diagnosis of specific neural patterns associated with a patient's ADHD and the use of those neural patterns to refine the choice of a specific medication for ADHD. He argues that QEEG patterns can provide a more reliable basis for medication selection than current diagnostic categories, because many individuals with the same symptom-based diagnoses evidence differing patterns of brain dysfunction.

### Feature Article

Erik Peper, Richard Harvey, I-Mei Lin, and Padma Duvvuri provide an article on the problems of procrastination, self-blame, and unproductive behavior in undergraduates. They report on a cognitive protocol using self-monitoring, a self-acceptance exercise, and a combination of paced breathing with positive mental rehearsal. They report on a matched group study using undergraduate health classes, and the group following the cognitive protocol showed significantly greater decreases in procrastination, increases in productivity, and increases in energy on Likert-type self-ratings.

### Clinical Note

Katherine Gibney and Erik Peper provide a useful *Clinical Note*, reminding practitioners that skills learned in biofeedback treatment must be systematically generalized to everyday life settings and that pathogenic behaviors contributing to symptoms must be modified or eliminated for patients to improve. They provide a vignette of a patient who showed effective relaxation of relevant musculature in sessions and implemented some health-supporting behaviors but persisted in a specific worksite behavior that hindered any clinical improvement.

### References

Centers for Disease Control and Prevention. (1999). Attention deficit/hyperactivity disorder: ADHD long term outcomes. Retrieved from <http://www.cdc.gov/ncbddd/adhd/workshops/outcomes.html>

Centers for Disease Control and Prevention. (2011). Attention deficit/hyperactivity disorder: Data and statistics. Retrieved from <http://www.cdc.gov/ncbddd/adhd/data.html>



Donald Moss



Rex Cannon



Robert Thatcher



Lucas Koberda



Jay Gunkelman

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### Proposal and Abstracts

Authors are invited to submit case studies illustrating any application of biofeedback, neurofeedback, or self-regulation-oriented therapies for a special issue on Integrating Biofeedback and Neurofeedback into Comprehensive Treatment Programs in Medicine and Mental Health for Fall 2014.