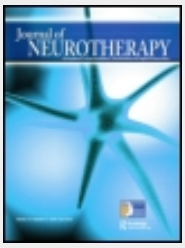

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The LENS (Low Energy Neurofeedback System): A Clinical Outcomes Study on One Hundred Patients at Stone Mountain Center, New York

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SUMMARY

Introduction. The Low Energy Neurofeedback System (LENS) developed by Dr. Len Ochs (2006a) uses feedback in the form of a radio frequency carrier wave, administered at a positive *offset* frequency from the person's own dominant EEG frequency. Although it is an unusual biofeedback procedure, the feedback being invisible and the subject passive, clinical evidence supports the efficacy of the LENS across a spectrum of conditions. Published research studies (Schoenberger, Shifflet, Esty, Ochs, & Matheis, 2001; Donaldson, Sella, & Mueller, 1998; Mueller, Donaldson, Nelson, & Layman, 2001) have shown the effectiveness of the LENS method with traumatic brain injury (TBI) and with fibromyalgia. No study to date has evaluated LENS treatment across the spectrum of disorders and with a significantly large sample. This study was devised to address these issues. The study hypotheses were that the LENS treatment would be effective in reducing both systematic symptom ratings and measurements of EEG amplitudes, and that the therapeutic effect would produce the most rapid improvements in early sessions of treatment.

Method. "Blinded" research associates selected the first 100 patients from approximately 300 case files that met the following inclusion criteria: the person had received at least 10 treatment sessions, completed an initial CNS questionnaire, and that session-by-session subjective symptom ratings (SSRF) had been obtained. Patients ranged from 6 to 80 years old, almost evenly divided between male and female, with a wide range of symptoms and comorbid DSM-IV diagnoses.

Results. Data were statistically analyzed for significance and corelational variables. Average symptom ratings across 15 major problem areas (e.g., anxiety, mood disturbance, attentional problems, fatigue, pain, sleep problems, etc.) showed significant improvements ($p < .0001$) from beginning to end of treatment. After an average of only 20 treatments the mean average of patient symptom ratings (0–10) declined from 7.92 to 3.96, a 50% improvement. Equally significant was the drop in EEG amplitude at the highest amplitude electrode site (HAS; $p < .0001$) as well as a lesser but still significant decrease at Cz ($p < .002$). A final analysis of the average symptom score with the HAS score showed them to be highly correlated. All hypotheses were

confirmed.

Conclusions. LENS treatment appears to be very efficient and effective in rapidly reducing a wide range of symptoms. It particularly produces rapid improvements in the first five to six sessions. Recommendations for future research are provided.

KEYWORDS: Neurofeedback EEG biofeedback LENS Low Energy Neurofeedback System

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