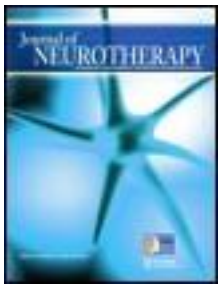

Journal of Neurotherapy: Investigations in Neuromodulation, Neurofeedback and Applied Neuroscience

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Neurotherapy Certification Board

As a physician using NeuroBioFeedback in my medical practice I am increasingly disturbed by an alarming trend. NeuroBioFeedback offers the opportunity to teach a patient the self-regulatory skills which will allow the brain to reorganize its functions at pervasive and profound levels. In fact, clinicians are accustomed to seeing diverse and seemingly unconnected areas of function responding to treatment directed to other functions indicating the system-wide effects of the treatment.

Unfortunately, a distressingly large number of clinicians feel free to initiate treatment based only on putative diagnosis (e.g., "I have ADD", "My daughter has fibromyalgia") without adequate diagnostic workups. This includes, at the very least, blood sugar, complete blood counts, hematocrits, Chem screen blood work and a quantitative EEG or brain map. Other tests may be necessary as well, depending on clinical circumstances. For example, apparent neuropsychiatric dysfunction may be due to heavy metal toxicity, atherosclerosis, hypoglycemia, vitamin deficiencies, endogenous histamine poisoning, dehydration, drug toxicity or a host of other underlying and/or contributing causes.

Reasoning that these tests, equipment and their interpretation lie outside their scope of practice and knowledge base, a frighteningly large number of otherwise dedicated and skillful practitioners allow themselves the luxury of not taking the thought process any further. Instead of reaching out to form collaborative relationships with other practitioners, including physicians, who can administer and interpret the crucial brain map, metabolic, structural and physiological studies which treatment of the brain warrants, they simply plunge forward and treat the diagnosis rather than the patient.

It is my belief that no one should receive NeuroBioFeedback without a Quantitative EEG carefully performed and knowledgeably interpreted in conjunction with other appropriate medical and neuropsychological data performed and integrated into a comprehensive treatment program. Otherwise, dire consequences (such as missing a tumor, unmasking a poorly-suppressed seizure focus, enhancing inappropriate immune system up-or down-regulation, to name a few possibilities) may well ensue.

It is for this reason that the NeuroTherapy Certification Board offers certification at three different levels (i.e., Associate, Certified NeuroTherapist and Diplomate) and strongly advocates the voluntary formation of collaborative networks which includes at least one physician. Given modern communication, it is no longer necessary that the members of these collaborative networks be physically near one another. Wherever one finds one's colleagues, every patient deserves an adequate workup so that each ones is appropriately diagnosed before treatment is initiated. Treatment can then be administered in light of a complete differential diagnostic consideration and, if necessary, parallel therapies addressing the other issues in the patient's condition can be simultaneously addressed.

For those practitioners who lack the funds or knowledge base necessary to purchase and use a brain mapper, let me point out that while I do not own an MRI, read EKG's or perform neuropsychological testing, I routinely refer patients to their clinicians for these tests, then collaborate with them on their interpretation of the data to ensure that my patients receive the best integrated care possible.

Collaborative treatment strategies will certainly increase the complexity (and probably the cost) of treatment but regulation of the brain is certainly no simple matter. Those who undertake it hoping for unidimensional simplicity will quickly find themselves in murky water roiled by clinical (and potentially legal) disturbances.

I strongly urge this level of self-constraint and mature collaboration before governmental regulatory agencies impose it upon us in order to prevent the abuses which arise when the central regulatory agent of the body, mind, heart and spirit

is regulated without regard to tis complex, multidimensional functions. I further urge all Neuro- Therapy practitioners to join the NeuroTherapy Certification Board in order to strengthen both their credentials and their collaborative networking in the best interest of their patients.

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EEG Equipment Evaluation and a "Gold" Standard

Over the past four years of learning about and working with neurofeedback several concerns and questions have kept coming to mind. Granted my background is in electrical engineering equipment design and evaluation, but I believe these are questions about factors that affect all of us in neurofeedback and are ones that we need to address.

Although there are quite a few types of equipment in use, there is little or no technical information available from the manufacturers, and no independent "equipment evaluations" done by anyone. What "independent" equipment information that is available (i.e. AAPB EEG Equipment Review) consists solely of manufacturers' brochure excerpts. It is my strong belief that an independent "Consumer Report" type of equipment review needs to be done. Such a review of neurotherapy equipment would help determine if the industry is really meeting its advertised claims on equipment performance and could be used by the consumer therapist in helping evaluate the "pros and cons" of different types of equipment. A review would also help point out areas of excellence and shortcomings that the manufacturers could use in equipment modifications. This would help them produce improved equipment and better meet the needs of the therapist. An adjunct should be a lively journal give-and-take discussion with consumers on their experiences using various types of equipment. Such a discussion would also serve to improve the field.

There are multiple articles written using different types of equipment to do neurotherapy, and differences seen are assumed to be due to protocol (frequency bands and sites used). There is no consideration as to the contribution of the equipment used to the neurofeedback process. (Remember that there has also been no independent check of the frequency or amplitude measurement characteristics of this equipment.) Comparing across equipment is quite questionable given this fact and the likelihood of equipment variations. My experience at the University researching with varied equipment seems to bear out that the equipment used has a marked impact on outcome and that various manufacturer types read and perform differently.

I have proposed a process of systematically investigating the characteristics of each type of EEG biofeedback equipment in use. First, a frequency sweep would be made over the operating bandwidth of each piece of equipment to determine if there was a "flat" and accurate response (no "peaks" or "valleys"). Identical, known signals would then be fed into various examples of the same type of equipment to evaluate design consistency and replicability. A further investigation of calculated parameters (constructs such as success percentages, "scores", etc.) would be made to determine their accuracy and limitations.

The next investigations would consist of looking at the responses of different types of equipment to the same inputs. Known signals would be inputted to various types of equipment to see if the analyses are comparable. The final step would be to submit various identical full-head spectral distributions to see if database evaluations are similar. This final step is somewhat involved and is a considerable undertaking, but most of the previous are rather basic, and we have already initiated some of these studies at the University of North Texas.

I believe that the above studies are beyond the resources of any present private or government institution. It is one of the responsibilities of professional organizations, such as SNR, to help plan,

coordinate and publish the results of such studies. I hope there is interest in such work and would be more than happy to participate. Thank you.

Robert Hamilton, Research Assistant

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