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Proper Development of Protocols for Neurotherapy

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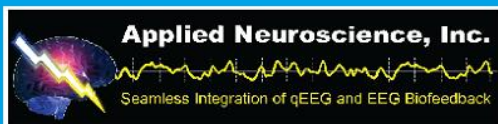
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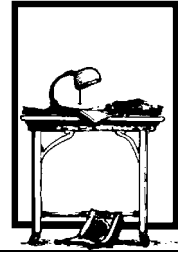
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EDITORIALS



Proper Development of Protocols for Neurotherapy

We should all be very concerned about the way in which protocols are developed and then used in terms of treatment in the public arena. Very often protocols are developed without any good theoretical basis, tried on a few individuals—sometimes with variable success—and then rapidly launched into the public arena for widespread use without appropriate validation. This approach is scientifically as well as ethically dangerous and can do a great deal of harm. There are some very important steps that one should take in the development of a protocol.

First, we should attempt to specify a clear theoretical foundation for why a particular protocol might be useful for treating a particular disorder. It is true that sometimes empirical data is gathered fortuitously and phenomenon is discovered and then a theoretical foundation is developed for explaining this phenomenon. An example of this was the original finding described by Tucker, Stenslie, Roth and Shearer (1981) which showed that there was a greater alpha power over left rather than right frontal regions during transient reduction of depressed mood in subclinically depressed individuals. Later in a very careful series of studies starting with the initial work by Henriques and

Davidson (1990, 1991), this frontal alpha asymmetry was further evaluated and shown to exist not only in adults with depressed affect but in children as well. A rather elaborate theory based upon these findings dealt with approach and avoidance behaviors being mediated differentially by the right and left frontal cortices. Once it was clear that with the use of a CZ reference it was possible to differentiate both trait and state based mood changes and dysthymia using the alpha asymmetry protocol, Peter Rosenfeld at Northwestern University and Elsa Baehr in clinical practice collaborated to show that change in the alpha asymmetry distribution could lead to very significant improvements in depressed patients often accompanied by medication reductions. Many of their patients have been followed for several years and continue to show progress.

In our own work involving attention deficit hyperactivity disorder, we have built a number of databases (Mann, Lubar, Zimmerman, Miller & Muenchen, 1992) based on quantitative EEG studies as well as studies based on single placements (Monastra et al. 1999) that showed children as well as adults with attention deficit hyperactivity disorder experience increased slow activity and decreased fast activity as measured by a theta-beta ratio at the vertex compared with non-clinical controls. These databases were developed along with a more recent one that I have developed involving more than one hundred and twenty individuals up to age eighteen with attention deficit disorder employing nineteen electrode locations and a variety of active tasks and baselines. This work expands and confirms that there are very significant differences in the EEG of individuals with ADD/HD compared with controls. These databases were developed based on our empirical findings in the 1970's and early 1980's, which show that many individuals with ADD/HD have this pattern. There also is a strong theoretical basis for expecting to see slowing in individuals who experience attentional difficulties. Once these initial findings had been confirmed and replicated in a number of studies that we and others have published over the past twenty-five years, the use of protocols based on these findings have become worldwide in their employment with strong positive outcomes reported. Basically then, the development of a theoretical position, a database, and protocols is a time consuming operation. Although a protocol may be refined over time, once it has met the standards of science the probability is very strong that it will endure and continue to meet the standards of reliability and validity. On the darker side, there are protocols that have been developed very rapidly and have been widely advertised on list serves and in the media that purport to produce a variety of positive effects such as increased attention, better optimal performance (whatever that means), and a plethora of health related benefits. These protocols may or may not be valid and may or may not stand the test of time and should not be unleashed upon the public without going through the

appropriate stages of validation, testing, and hopefully, associated database development.

One very important question regarding neurotherapy interventions is what is the effect on the entirety of cortical regions when training is undertaken in a particular location. We are currently engaged in studies in our laboratory evaluating two different protocols: one, the standard theta-beta protocol for attention deficit disorder and the other, a protocol that has been recently acclaimed for a variety of positive outcomes based on decreasing the amplitude of all frequencies up to 40 Hz simultaneously. We hope that when these studies are completed we will have some additional data on how engaging individuals in these specific protocols effects widespread cortical activity and perhaps intracortical activity as well as based on LORETA analyses that we are currently in the process of developing.

Another related concern is offering to the public home training devices that employ protocols that have not been thoroughly tested and properly evaluated. This could be extremely dangerous and might actually have negative effects such as increasing depression, seizure activity, dissociative reactions, or other neurological outcomes that will be most undesirable. I recommend that SNR, and perhaps the EEG Division of AAPB, consider developing an application standard position paper on how new findings should be moved in a stepwise fashion from the laboratory domain to the public. We should be particularly careful when a new protocol might involve children who are very vulnerable and for which special consideration has to be taken in terms of any kind of manipulation of brain electrical activity.

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