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What exactly is Neurofeedback?

Akin to biofeedback, Neurofeedback is an experimental technique that employs visualization of electroencephalographic waves to reinforce training so that people can better control troublesome and problematic behavioral symptoms such as poor attention, anxiety, depression, and perhaps even tics. The data to support its usefulness in TS are much too preliminary for us to recommend this treatment outside of a research setting. However, there is credible information that does support its possible efficacy for other conditions such as attention deficit disorder (ADHD), learning disabilities and anxiety. Interestingly, rather than choosing to treat the whole symptom spectrum of ADHD, it seems that these techniques are most effective when specific symptoms of a condition are targeted. For instance, when employing this technique for ADHD target symptoms might be limited to problems with inattention or impulsivity.

How does it work?

The technique attempts to link mental control of specific symptoms to the visual display of brain waves that are recorded while the patient is being guided on how to best focus his mental energy to control a specific

symptom. Neurofeedback uses electroencephalographic and other physiologic recording methods similar to those used to examine the brain in cases of epilepsy. For training purposes, a simplified version of these recordings is projected onto a screen and viewed by the subject. During these training sessions subjects learn how to maximize control of a particular symptom by learning how to consciously manipulate these waves. Every time the trainee successfully links a specific brain wave to the designated symptom he is trying to reduce, a positive feedback signal is generated. This reinforces the learning process. The theory is that with practice, that link occurs faster and becomes stronger. The ultimate goal is to be able to use this new skill independently, without the feedback from the recording machine.

Why do some believe that it works for people with TS?

The theory used to justify using Neurofeedback for TS is that the fundamental physiological problem with TS is an abnormality affecting brain inhibition at the cortical and/or sub-cortical levels. It follows that the aim of Neurofeedback for TS symptom reduction is to help restore this inhibitory "gating" (read as filtering) capacity of the brain. Abnormal gating of brain activity has also been linked to

inattention (e.g., failure to block extraneous stimuli), failure to gate impulses in compulsive behavior and an inability to gate repetitive thoughts in OCD as well as tics. Basically, this theory proposes that an enhanced inhibitory capacity can be achieved through Neurofeedback and will lead to improvement in the ability of patients to "keep the lid on" or inhibit the "leakage" of neural impulses. These unwanted impulses can be in the form of the tics of TS or in the form of other types of mental processes.

Is Neurofeedback a good idea to consider for TS?

Not all symptoms of TS may be responsive to these interventions, and more than one Neurofeedback approach may be required in a given subject. For instance, a technique developed to improve inattention may actually aggravate tic control. Prioritizing which symptom is to be targeted first will depend on which of the many TS symptoms of TS responds best to this experimental technique. Which symptom is most disabling to a person is also an important consideration.

Is Neurofeedback ready for prime time?

Given this complexity and lack of confirmed data it becomes clear that more information is needed before we can answer such questions as: How long a period of training is needed before the



skill becomes independent of the recorded feedback? Does the duration of training differ for those with TS who also have co-existing conditions such as ADHD and OCD? How many symptoms can be targeted during a course of Neurofeedback? How long does the effect last once the training is 'completed'? Are booster or maintenance training sessions necessary? How available is Neurofeedback in local communities? What kind of verifiable certification and professional training should practitioners offering these techniques have? And lastly, how well do these professionals know about and understand the many complexities of having TS?

In summary, as a TSA Medical Advisory Board member and a physician who has treated people with TS for many years, I believe that a great deal more research is needed in this field before Neurofeedback should be recommended for the routine treatment of TS. ●

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