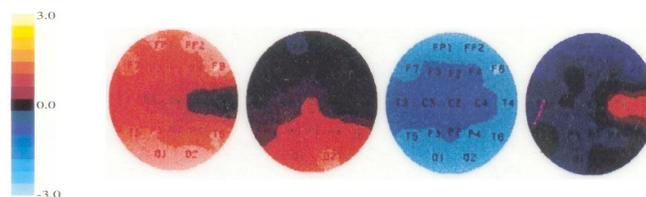


WHAT ARE ADD/ADHD AND LEARNING DISABILITIES?

Attention deficit disorder, learning disabilities and autism are brain/neurological disorders that become increasingly disruptive during childhood, adolescence, and into adulthood. The structure of the brain is usually normal, but the manner in which the brain is functioning is abnormal in someone with ADD/ADHD or LD, and autism.

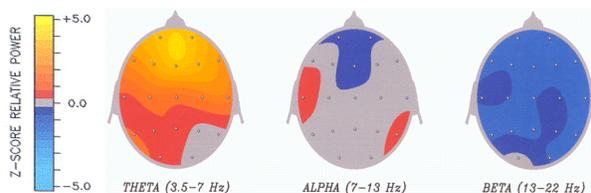
People with LD, ADD/ADHD or autism usually have brainwaves characterized by the presence of inefficient, excessive slow brainwave (delta, theta, or alpha) activity. The brain is simply not operating correctly. Below is part of a quantitative EEG brain map illustrating the typical profile of someone with a learning disability (LD). Black represents normal, red-yellow-white indicate an excess, and lighter shades of blue an increasing deficiency. The map below shows excessive theta activity toward the rear of the head, in auditory and visual processing areas of the brain, and very slow delta brainwave activity throughout much of the brain.

QEEG PROFILE OF LEARNING DISABILITY



Children or adults with ADD or ADHD usually have quite different brainwave patterns than we see in LD or autism. In ADD/ADHD there tends to be a slowing of brain activity in the frontal and central regions of the brain, most often in the theta or alpha frequency bands. Scientific research has identified several different subtypes of ADD/ADHD, the most common being the theta subtype, seen below. This map (which comes from a different normative database than the one above) is from a boy with ADHD. It shows very excessive theta activity, especially frontally, and a deficiency of healthy beta brainwaves. There is also an alpha subtype more often seen in adults or teenagers, and a beta subtype which is less common. There are also many individuals who display a combination of the different subtypes. Therefore, a careful and thorough assessment of brain function is important.

THETA SUBTYPE OF ADD/ADHD



Although estimates vary, ADD and ADHD are generally believed to afflict 8-10% of all children. In either adults or children, it is characterized by inappropriate degrees of inattention, hyperactivity, excess energy, and impulsiveness. There are typically problems with concentration, mood, sleep, learning, memory, poor grades, difficulty listening or completing tasks, excessive talking, fidgeting, and difficulty paying attention to tasks at hand. Long term results of *untreated* ADD/ADHD can include diminished academic performance, increased personal problems (e.g., divorce, work problems, psychiatric problems, difficulties with the law), and reduced income earning potential. Learning disabilities (LD) often involve problems with auditory/visual processing and problems with reading, math, speech, and in other areas. In people with the alpha or theta subtypes of ADD/ADHD, essentially the frontal lobes are lazy and underactive. The brain's frontal lobes are the executive control centers that control attention, emotion, and behavior. When there is slowed brainwave activity frontally, the brain lacks the proper inhibitory capacity. The result is a problem controlling attention and poor intellectual efficiency, problems controlling emotions, and problems controlling behavior. Thus, the person tends to be impulsive, lacks good judgement, and acts on the emotion and impulse of the moment without adequately considering consequences. Because the brain is not functioning properly, the inhibitory processes of the frontal lobes are not adequately putting on the "brakes" to create self-control.

TRADITIONAL TREATMENT VS NEUROFEEDBACK

Medication treatment does produce short-term improvements in ADHD symptoms in about 70% of cases, as long as someone remains on the drugs. There is little medication research on ADD, Inattentive Type. Almost all of the studies of the effects of medication have a short (3 week average) and long-term follow-up studies after 3, 5 and 7 years have failed to show long-term improvements in ADD/ADHD problems. Use of ADD/ADHD medication is also associated with side effects such as stunted growth and increased risk for developing Parkinson's.

In contrast, a large number of studies, including randomized placebo-controlled studies, have documented the efficacy of neurofeedback with follow-up ranging from 1 to 10 years. A recent meta-analysis (Arns, de Ridder, Strehl, Breteler, & Coenen, 2009) concluded that neurofeedback treatment of ADD/ADHD meets criteria for being classified as an efficacious and specific treatment—the highest level of scientific validation. ADD/ADHD symptoms commonly improve in 75-80% of patients, and research has found IQ increases ranging from 6 to 23 IQ points!