

# QEEG and Neurofeedback with Concussions

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Athletes and adults are having more frequent concussions than ever before. Concussions commonly occur from automobile/motorcycle/bicycle accidents or sport injuries. Often the negative effects of concussions do not occur immediately after the head injury. In addition, post-concussion problems may not appear in the usually recommended MRI or CAT scan tests.

QEEG (Quantitative Electroencephalography) Mapping uses a statistical analysis of EEG brainwaves to assess amplitude, instabilities and connectivity abnormalities in specific locations where the injuries occur. A neurologist also reviews each EEG for neurological deficits such as seizures. Attention Performance Center uses the results of QEEG Mapping to develop individualized protocols for a treatment called Neurofeedback or EEG Biofeedback. Research on the use of QEEG with patients with Head Injuries indicated (Duff, 2004) indicated that the QEEG Map was the most sensitive type of brain imaging test for identifying post-concussion syndrome.

In addition, Attention Performance Center is one of the first centers to use a new Neurofeedback system called SmartMind (link to SmartMind page), which combines Neurofeedback with an established Cognitive Rehabilitation program called Captains Log ([www.braintrain.com](http://www.braintrain.com)). The Captains Log Program improves skills such as working memory, attention, visual and auditory processing, motor coordination and impulsivity. The SmartMind system requires the individual to maintain a calm, attentive state while the Captains Log program is running. If the individual becomes tired, inattentive, anxious or impatient, the equipment returns the individual to the Neurofeedback program to assist in staying in the appropriate mental state during training. Research on combining Neurofeedback and Captains Log (Tinius & Tinius, *Journal of Neurotherapy*, 2000) found significant improvements for both auditory and visual attention and response accuracy for ADHD and mild traumatic brain injury.

This is an abnormal EEG with frequent paroxysmal sharply contoured theta discharges predominantly seen in frontal leads with a right predominance. This suggests impairment of frontal cortical function, greater on the right. These findings are considered consistent with a history of concussive injury.

