

## Traumatic Brain Injury

Traumatic brain injury (TBI) can result in problems with cognition, behavior, emotional sensitivity, and attention. Patients can frequently become much more impulsive, appear to have poor judgment, have memory and word finding problems, and often are not very aware of their problems. There can also be significant deficits in planning and organizing (Varney & Roberts, 1999). There are some two million brain injuries every year in the USA, and while most appear to recover completely, a substantial minority &mdash; up to 50 percent &mdash; can have enduring symptoms six months or more after the injury (Jacobson, 1995).

Within that 2,000,000, and the vast majority are mild cases. By definition, mild TBI means a loss of consciousness of less than 20 minutes, with a post-traumatic amnesia (PTA) of less than 24 hours. Post traumatic amnesia is defined as the period of time from the accident until there is reliable and consistent memory. Brain injuries with longer durations of these variables are considered moderate or severe brain injuries.

**Neurofeedback** is the biofeedback modality most commonly used to treat traumatic brain injury. It is almost always the case that mild TBI is the level seen by the private practitioner; severe cases of brain injury are usually not treated with neurofeedback, although there are exceptions (Larsen, 2009).

Thatcher (1999, 2000) advocates obtaining a quantitative electroencephalograph (QEEG) in order to determine which of the 2500 variables to focus on with respect to the neurofeedback. When the problematic sites are identified, these variables become the focus of targeted treatment. The QEEG then can be a means of scientifically noting progress in the TBI patient.

One interesting form of neurofeedback is called HEG biofeedback. This type of biofeedback trains the patient to increase their cerebral blood flow in the frontal lobe, and this is very helpful for most people who have had traumatic brain injury. In fact, this kind of biofeedback also helps with attention problems, headaches and depression.

### References:

Larsen, S. (2009). The special applicability of the low energy neurofeedback system form of neurofeedback to traumatic brain

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Thatcher, R. (2000). EEG operant conditioning (biofeedback) and traumatic brain injury. *Clinical Electroencephalography*, 31, 38-44.

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