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## The visual evoked potential as a clinical tool in the assessment and treatment of traumatic brain injury

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**Purpose:** The purpose of this investigation is to evaluate changes in brain function associated with concussion, and or post-concussion syndrome individuals with emphasis on the vision sensory signal and thalamus lateral geniculate nucleus to primary visual cortex, employing the visual evoked potential (VEP) test; also, to establish the influence of vision therapy on recovery, used by the waveform properties of the VEP.

**Methods:** The study was done by means of biasing the magnocellular pathways using a low Michelson contrast, temporally modulated phase reversing checkerboard stimulus pattern and successive spatial frequencies, simultaneously measuring the VEP. First, a base line of VEPs for the normal group was established and then the normal group results were compared to the concussion, and or post-concussion syndrome group.

**Results:** The normal control group VEP results of successive spatial frequencies, show repeatable findings, depicted by a temporal organization of latency, represented by an upward slope. The concussion and post-concussion group results indicated a temporal disorganization of latency of subsequent neural impulses resulting in a skewed and non-upward slope.

**Conclusion:** The failure of the lateral geniculate nucleus (LGN) to successfully filter and deliver relevant signals in temporal order to the visual cortex caused failure in synchronizing the feedforward connections to the feedback pathways consisting of top-down information that facilitate reentrant processing, or meaningful perception. Following completion of vision therapy the signs and symptoms of concussion or post-concussion resolved, and the visual evoked potential returned the temporal organization of latency, represented by an upward slope.

**Notes:**