

# Traumatic Brain Injury Study In 5 Days

## 62% of Symptoms Resolved, 85% Improved

### Using Clarity Chair Sensory Stimulation Treatment

#### Clarity Chair

Clarity Chair is a patented, medical device that uses technology to deliver a non-invasive, effort free, 5-day sensory stimulation therapy proven effective in IRB research to treat Traumatic Brain Injury. Clarity Chair therapy was designed to improve interaction between the brain and sensory system.

#### Sensory Problems in TBI

Patients with Traumatic Brain Injury (TBI) often present with sensorimotor and cognitive deficits along with long term altered sensory processing. auditory, vestibular, and visual symptoms are frequently reported. These sensory symptoms can negatively affect the individual's ability to process cognitive information and perform daily tasks such as communication.

#### Neuroscience Adopts New Term

Neuroscience uses the term "sensory integration" to refer to converging information in the brain from one or more senses. A recent subspecialty in neuroscience is multisensory integration (MSI), in which the neural process combines sensory input from two or more different sensory modalities.

(*Perspectives on Sensory Processing Disorder: A Call for Translational Research, Front Integr Neurosci.* 2009 Sep 30; 3: 22. Lucy J. Miller, Darci M. Nielsen, Sarah A. Schoen, and Barbara A. Brett-Green).

A multitude of studies have found that multisensory integration (MSI) yields results that are significantly greater than using any single sensory stimulation. (*J Neurophysiol* 97: 3193–3205, 2007. doi:10.1152/jn.00018.2007. *Multisensory Versus Unisensory Integration: Contrasting Modes in the Superior Colliculus*, Juan Carlos Alvarado, J. William Vaughan, Terrence R. Stanford, and Barry E. Stein Department of Neurobiology and Anatomy, Wake Forest University School of Medicine, Winston-Salem, North Carolina).

Most of the studies with multisensory integration use input from only two senses, auditory & visual or auditory & tactile.

#### Why Clarity Chair Is Faster and Easier

Clarity Chair combines 5 different sensory inputs, auditory, visual, tactile, vestibular and proprioception, at one time, something not previously seen. This approach has decreased the treatment time to only 5 days.

In addition, the treatment is passive, requiring no effort from the client. They simply lie in a comfortable reclining chair that stimulates three senses while listening to specially developed filtered music and watching various colored fading lights which provides the auditory and visual therapy. No supervision may be needed depending on the client's ability to remain awake and seat belted.

## IRB Trial Results

Five participants were followed from pre assessment to 1-month follow-up assessment. A total of 17 concussion symptoms were assessed on the survey. An average of 62% of chronic symptoms resolved and 85% of symptoms improved.

Symptoms rated were headache, dizziness, depression, anxiety, impaired memory, irritability, impaired concentration, tinnitus, hearing impairment, blurred vision, diplopia, sensitivity to light and noise, fatigue, sleep disturbances, impaired attention, slow reaction time and slow speed of information processing.

Objective evaluations occurred for the following:

- Episodic memory
- Executive function
- Processing speed
- Multitasking
- Planning
- Paired Associates Learning (PAL): 8 minutes
- Reaction Time (RTI): 3 minutes
- Spatial Working Memory (SWM): 4 minutes
- Multitasking Test (MTT): 8 minutes
- One Touch Stockings of Cambridge (OTS): 10 minutes
- Motor and mental response speeds, as well as measures of movement time, reaction time, response accuracy and impulsivity.
- Visual memory and new learning
- Hearing test for ear dominance
- Visual fields
- Spatial planning
- Working memory strategy
- Working memory errors.

## Study Results:

Participant	# Symptoms at Start	# Symptoms at End	% Resolved	% Improvement
1	11	2	82%	82%
2	14	5	64%	79%
3	16	6	63%	81%
4	13	8	38%	92%
5	13	5	62%	92%

Average of 61.8% of symptoms resolved

Average of 85.2% symptoms improved