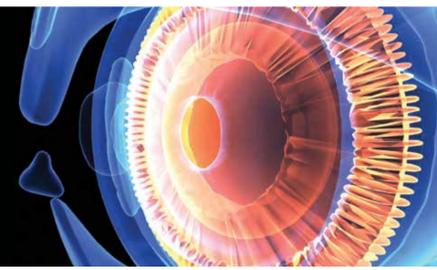


Treatment Modalities for Acquired Brain Injury

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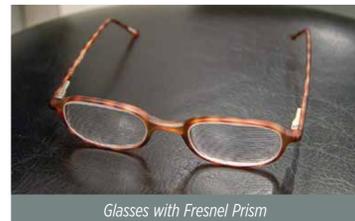


BACKGROUND

Acquired Brain Injury (ABI) is an umbrella term for damage to the brain caused by one of a variety of conditions, including stroke, head trauma, and hypoxia.¹ ABI is a leading cause of death and disability in the United States, affecting more than 3.5 million people annually.^{2,3} Survivors of ABI may experience impaired cognitive and motor function and changes in sensations and emotions, lasting for a few days or life.^{1,4} The consequences of ABI can negatively impact activities of daily life (ADL),⁴ especially for those experiencing confounding visual deficits. Optometric interventions, including lens therapy, prism and visual rehabilitation, can play a key role in improving quality of life for those suffering lasting effects of ABI.

LENS-ONLY THERAPY

- 51 year old male with a history of suffering multiple strokes presented with constant double vision and head tilt
 - Most recent: right MCA CVA
- Diagnosed with 15^Δ CAXT and 10^Δ CLHoT (hypotropia)
- Trial with Fresnel prism for four weeks
 - Optimal prism amount and direction determined by subjective measurement
 - 8 base down OD, 8 base up and 6 base in OS

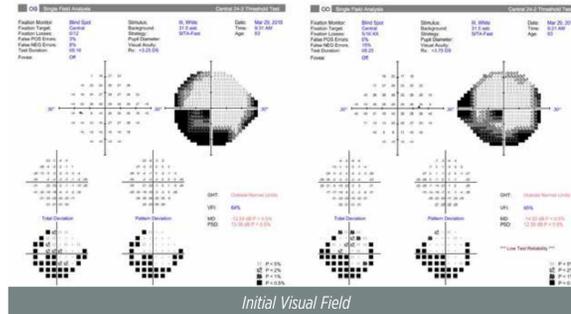


- Prescribed ground-in prism to improve his eye alignment and eliminate his symptoms

HOME-BASED THERAPY

- 84 year old male with a history of right parietal lobe stroke presented with metamorphopsia and delayed visual input on his left side

- Diagnosed with homonymous inferior left quadrantanopsia



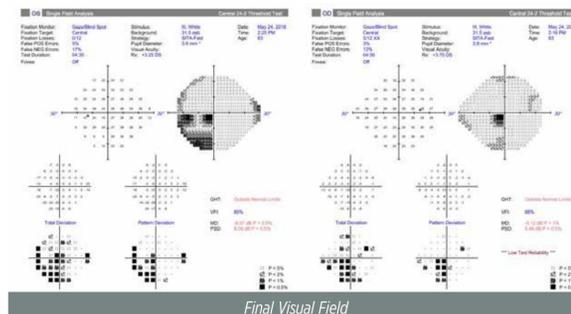
Initial Visual Field

- He elected to begin at-home vision therapy with quarterly office visits

ACTIVITY	GOAL
Eye Control	Eye movements independent of body Full range of motion
Marsden Ball Tracking	Pursue objects in space using eyes Improve fluidity of eye movements
Modified Greenwald	Pursue objects in space using eyes only or head only Improve vestibulo-ocular coordination
Wall Saccades	Accurately move eyes in space Locate an object in space by moving eyes (saccades)
Tennis Ball Bouncing	Improve awareness of affected space Improve eye-hand coordination

TABLE 1: Home-Based Visual Rehabilitation Activities

- He has noted a decrease in the intensity of his symptoms and his visual field defect has become less dense



Final Visual Field

IN-OFFICE THERAPY

- 32 year old male with a history of anoxic brain injury presented with impaired speech, hemiparesis and difficulty with visually guided motor movements, visual memory, and spatial awareness
- Diagnosed with oculomotor dysfunction, binocular vision dysfunction, visual perceptual deficits, visually guided motor deficits
- He enrolled in office-based vision therapy

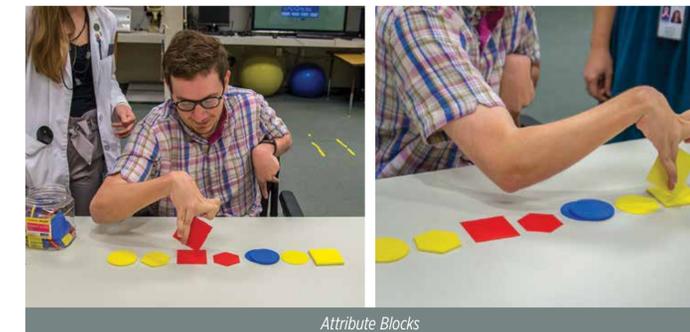
	SKILL	ACTIVITY	GOAL
EARLY ACTIVITIES	Ocular Motility	Eye Control	Eye movements independent of body Full range of motion
		Computer Saccades	Locate an object in space by moving eyes (saccades) Improve laterality and directionality
EARLY ACTIVITIES	Binocularity	Quiots Vectogram	Improve awareness of both visual channels Improve coordination of the vergence system
		Brock String	Improve awareness of both visual channels Improve coordination of the vergence system
INTERMEDIATE ACTIVITIES	Ocular Motility/VMI	Wayne Saccadic Fixator	Locate an object in space by moving eyes (saccades) Eye-hand coordination
		Binocularity/VMI	Pointer Straw
INTERMEDIATE ACTIVITIES	VMI/Spatial Awareness	Meyer's Flying Rings	Improve spatial relations Eye-hand coordination
		Marsden Ball Games	Pursue objects in space using eyes Eye-hand coordination/bilateral integration
LATE ACTIVITIES	Ocular Motility/Figure Ground	CPT Visual Scan	Improve ability to identify objects in a crowded background Eye-hand coordination Improve saccades and scanning ability
		Visual Perception	Multimatrix
LATE ACTIVITIES	Visual Perception	Attribute Blocks	Eye-hand coordination Improve visual discrimination of similarities and differences Improve ability to scan environment for specific objects
		Visual Memory	CPT Tachistoscope
LATE ACTIVITIES	Visual Planning	Giant Pegboard	Eye-hand coordination Improve ability to use environmental visual cues



Eye Control



Giant Pegboard



Attribute Blocks



CPT Visual Scan

CPT Visual Closure

DISCUSSION

ABI resulting in long-term disability negatively affects a patient's quality of life. By improving visual function, optometric physicians can have a major impact on ABI recovery. Optometric intervention, including lens therapy, prism, and/or visual rehabilitation, can help improve a patient's visual function and quality of life. The variety of treatment modalities available allows for tailoring of therapy techniques to each patient's unique case and visual goals.

ACKNOWLEDGEMENTS

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