

Introduction

A concussion is a traumatic brain injury that alters the way a brain functions. Effects are usually temporary but can include long-term retention of symptoms e.g. concentration, memory, balance and coordination. The purpose of this study is to document the changes in balance, vision, hearing, and cognition of a post-concussive male receiving sensory integration using the SAVE Table.

Clinical Features:

A 69-year-old male presented subsequent to a fall in 2015, suffering fractured skull, memory loss, and concussion. Using a symptom list adapted from other traumatic brain injury surveys in published literature, self-reported symptoms included:

Dizziness	Hearing Impairment	Blurred Vision	Diplopia
Irritability	Sensitivity to Noise	Sensitivity to Light	Fatigue
Tinnitus	Sleep Disturbances	Slow Reaction Time	

Clinically evaluated deficits included diminished peripheral vision, unstable balance and cognitive impairment.

Intervention:

SAVE stands for Sensorimotor Auditory Visual Education. The SAVE Program is an accelerated sensory integration protocol that simultaneously stimulates the auditory, visual, tactile, vestibular, and proprioceptive systems. During the SAVE protocol the patient rests on an adapted reclining table that undergoes a series of motions. While passively moving, specific music is played through headphones and patterns of colored lights are presented directly in front of the patient. Treatment consists of two, one-hour sessions per day for five consecutive days.



Figure 1 is a depiction of a patient on the SAVE Table

Outcome Measures:

Participant received cognitive, visual, balance, auditory testing, and a symptom survey pre-care, post care, and one-month post care. The cognitive battery was specific for symptoms related to traumatic brain injury. Visual testing was a modified version of a tangent screen test. Balance tests were 10 seconds each and consisted of eyes open on firm surface, eyes closed on firm surface, eyes open on foam, and eyes closed on foam. Auditory testing used clicks of varying frequencies and intensities to determine ear dominance. The symptom survey used a Likert scale ranging from "none of the time" to "all of the time" regarding 17 common post-concussive symptoms.

Results:

Table 1

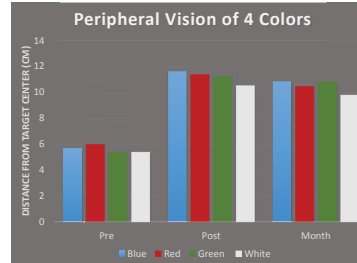


Table 1 results show an extended field of vision post care with an ability to correctly recognize and identify colors at a greater distance from the center of the target.

Table 2

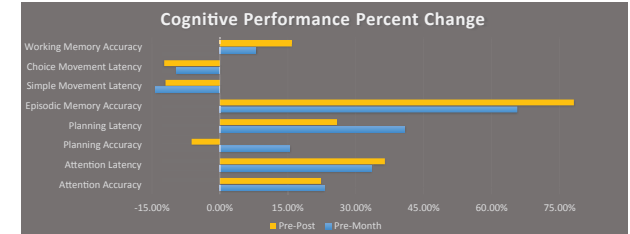


Table 2 results show positive percentages indicate improvement. Negative percentages indicate decline. Simple and choice movement indicate participant's reaction and movement to touch target on screen. Results show that, except for movement latencies and planning accuracy, cognitive performance did improve from baseline to post care. Results also show that, except for planning latency, planning accuracy and attention accuracy, cognitive performance improvements were not maintained until the month post test.

Table 3

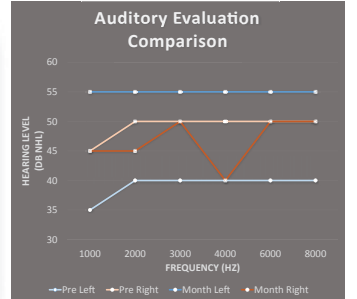


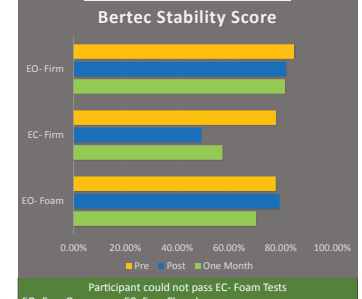
Table 3 results show a decline in left ear performance with right ear improvement in 2000 and 4000 Hz. Suggested by inventor of SAVE table that this indicates a shift in dominance from left to right

Table 4

	Pre	Post	Month
Symptom Score	20/68	7/68	8/68
Number of Reported Symptoms	11/17	4/17	2/17

Table 4 results show participant reporting 2 symptoms on the month post survey; hearing impairment and sensitivity to noise. Note: participant wears a hearing aid.

Table 5



Participant could not pass EC- Foam Tests
EO- Eyes Open EC- Eyes Closed
Table 5 results indicate a decrease in stability in all tests. Participant verbally reported less dizziness and better ability to bend over without falling. Additional investigation is needed.

Conclusion:

Following the SAVE Program protocol, a 69 year-old, post-concussive male showed a shift to right ear dominance along with improvements in cognition, peripheral vision, and self-reported symptoms. Balance assessments need additional investigation. These results show that the SAVE Program may be a potential therapy for post-concussive symptoms.

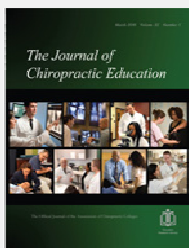
Acknowledgement

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Sensory integration therapy utilizing the SAVE Program: A case report of a post-concussive adult.

Angela Seckington, Stephanie Sullivan, Emily Drake

Objective: Documentation of changes in balance, visual, auditory and computerized cognitive testing of a post concussive male receiving sensory integration care using the SAVE table. **Clinical Features:** A 69-year-old male presented subsequent to a fall in 2015, suffering fractured skull, memory loss, and concussion. Using a standardized symptom list, self-reported symptoms included dizziness, sleep disturbances, slow reaction time and impaired attention. Clinically evaluated deficits included diminished vision, unstable balance, and cognitive impairment.

Intervention and Outcome: The SAVE Program is an accelerated sensory integration protocol that stimulates touch, sound, sight and proprioception along with the vestibular system. Treatment consisted of two, one-hour sessions per day for five consecutive days. Improvement was noted in self-reported symptoms (32%), in peripheral vision (from 15° to 30°), and balance (from 42° to 6° instability). Percent improvement was also noted in cognitive function (accuracy, latency) in attention (18.75%, 33.42%) and planning (16.66%, 40.71%), and in accuracy of episodic memory (71.43%) and working memory (7.94%). Participant exhibited shift to right ear dominance. **Conclusion:** The SAVE program may benefit patients who have suffered a concussion with continuing sensory, balance, and cognitive deficits. Additional research is needed. (This is a conference presentation abstract and not a full work that has been published.)