

FRIENDS OF NVT

OFFICIAL NEWSLETTER OF INNEURACTIVE



INTRODUCTION

Welcome back to Issue 2 Volume 7 of the Friends of NVT Newsletter! In the main portion of today's newsletter, our author Esha Reddy reviews a research article discussing the new Montreal Brain Injury Vision Screening (MOBIVIS) test for general practitioners.

In our "How To" this week, Dr. Joseph Clark provides methods for using fusions cards for binocular vision and NVT!

We encourage you all to leave questions and/or comments below. Thank you for the continued interest and enjoy!

If you missed an issue, please visit <https://inneuractive.com> where all issues are available for free. Please tweet and share with your friends as we plan to release more great content. @FriendsofNVT.

WHAT'S IN OUR LATEST ISSUE:

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- Montreal Brain Injury Vision Screening - Article Review - Esha Reddy
- Fusion Cards for Binocular Vision and NVT - Dr. Joseph Clark
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Montreal Brain Injury Vision Screening – Article Review

As discussed in our last issue, around 80% of patients who incur a mild traumatic brain injury (mTBI), including concussions, report lingering visual symptoms. These include symptoms regarding eye movements, reading, visual attention, visual motion sensitivity, accommodation, convergence, and others (I1V7).

Although visual sequelae are commonly reported following a concussion, vision care following traumatic brain injury is rare. Unfortunately, access to vision care for the post TBI patient is limited. In the US, “there are ≈16 optometrists for every 100,000 persons in urban cities, 6/100,000 in rural areas and more importantly, 25% of US counties do not have even one optometrist. As a comparison, primary care physicians are three times more present across the US with a distribution of 50/100,000 while only 5% of US counties do not have a primary care physician” (Farishta 2022). With the lack of access to vision care specialists, primary care physicians must be able to evaluate their patients for visual symptoms. However, primary care physicians do not have specialized vision care related training and thus, it is uncommon for family physicians to perform visual system tests on patients during an initial clinical evaluation post TBI.

In recognizing the need for primary care physicians to evaluate and identify visual abnormalities following TBI, Dr. Farishta and Dr. Farivar developed the Montreal Brain Injury Vision Screening (MOBIVIS) – an effective and efficient protocol for use by general practitioners (Farishta 2022).

MOVIVIS tries to address the disconnect between MDs, ODs and therapists by providing diagnostic information that can be used to guide NVT oriented rehabilitation.”

Existing optometric protocols, often used by occupational therapists and optometrists, can be divided into two categories. The first category is protocols that review the literature regarding TBI and visual symptoms and then pinpoint how TBI affects certain visual components. The primary issue with these types of protocols is that they are lengthy and require a certain level of optometric knowledge to perform and understand. The second category consists of screening and diagnostic protocols. These protocols are helpful given that they not only pinpoint how TBI affects visual systems but include methods for screening and diagnosis. Again, these protocols are lengthy and not effective for use by a general practitioner without optometric training.

In designing the MOBIVIS protocol, it was important to identify the visual systems most commonly affected by TBI. In examining multiple studies, it was found that most visual complaints had deficiencies in the binocular vision or oculomotor systems. Convergence and accommodation insufficiency, photophobia, and abnormal spatial localization were among the most reported symptoms. Issues with convergence and accommodation can be the most taxing for patients as they can contribute to dizziness and nausea and/or prevent routine activities. Given their recurring nature, these symptoms became the major focus of the protocol.

Previous studies where researchers were seeking to design optometric diagnostic protocols for post-TBI patients do exist. In the studies reviewed, accommodation and convergence insufficiency were focal points of the protocols. Similarly, the MOBIVIS protocol operates with convergence and accommodative insufficiency evaluation at its center. While other visual abnormalities such as cranial nerve disorder, ocular injuries, and visual field defects may occur following TBI, they are relatively uncommon and require specialized training for accurate diagnosis. Thus, they are not included in the MOBIVIS protocol.

The short, new protocol contains five questions and ends with two tests. The first question addresses whether there is a binocular vision involvement and the second question targets accommodation insufficiency.

For its third question, MOBIVIS takes inspiration from the Brain Injury Vision System Survey (BIVISS), one of the two most used TBI-related questionnaires. When developing the BIVISS, researchers found that questions relating to the perceived spatial location were highly effective in determining control groups from concussed patients. Consequently, MOBIVIS's third question focuses on perceived spatial location. Lastly, question five relates to photophobia.

After answering the five quick questions, primary care providers will perform a near-point convergence test for convergence insufficiency which will be followed by a test for accommodative insufficiency.

The result of the MOBIVIS questionnaire range from 0 (no deficiencies) to 8 (significant deficiencies) and can be used to convey severity of the visual system's involvement post TBI. For the near point convergence test, a score of 10-12cm can indicate abnormality; for the reading test, if performance improves with a positive lens, the patient may have an accommodative insufficiency (Farishta 2022).

With concussions accounting for the majority of TBIs and scarce vision care access, the MOBIVIS protocol allows primary care physicians to quickly and accurately assess mTBI patients' vision.

References:

Abbas Farishta R, Farivar R. Montreal Brain Injury Vision Screening Test for General Practitioners. *Front Hum Neurosci*. 2022 Jul 14;16:858378. doi: 10.3389/fnhum.2022.858378. PMID: 35911590; PMCID: PMC9330036.

“How To” – Fusion Cards for Binocularity and NeuroVisual Training

In my personal experience, one of the most common visual deficiencies I see in patients post traumatic brain injury (TBI) and concussion is difficulty fusing the image. Fusing the image refers to binocular vision and the = brain’s ability to perceive and process both images coming from both eyes. Multiple steps are required for the brain to perceive and process the two images coming from the eyes and are too plentiful to discuss in this brief article. What we will focus on in this article concerning fusing the image is fusion cards. Fusion cards are one tool to aid in vision testing and vision training for people post TBI and concussion.

In the image below (Figure 1), we see two sides of one fusion card. The card has the green and red rectangles on opposite sides. This card is used to ensure that both eyes are working by placing the card in front of the person’s eyes vertically such that one eye at a time sees one color. Typically, the person is told to look at a far fixation target, greater than 20 feet, and be aware of the colors. Then, they are asked to look at the farthest rectangle and try to make the two colors be coming from alternating sides. In other words, the red on the right and the green on the left. Then to switch sides. The subject will hold the image of the two colors for about 10 seconds or shorter if it is fatiguing them.

Changing the duration of the hold, the side the colors are on, and the sized rectangle are all ways to progress the difficulty of the task. The goal is to ensure binocular vision by seeing two colors and to control the location of the cards, which trains the eyes to fuse when appropriate.



Figure 1. Both side of a fusion card.

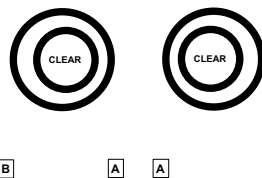


Figure 2. Eccentric circle cards.

The images above (Figure 2) are of two cards sometimes called eccentric circle cards. They are placed next to each other in the image above as this is the common orientation for the cards when using them. The cards are held about 1 inch apart and about 1.5 feet from the person’s face. The cards are brought closer to the person and the person being tested is asked to try to fuse the two circles together to form a third circle in the center. The A in the bottom can also fuse into one A.

The word “CLEAR” should overlap as well. If a person can see 3 sets of circles, 2 Bs and 1 A they are asked to hold that for 10 seconds. Note the distance of the cards from the person’s face and the distance apart. This drill works the binocular system as both eyes need to be working to see 3 circles. It also trains the eyes to fuse an image. The drill can be progressed in complexity and difficulty as a patient improves by changing the spacing of the cards apart and by changing the distance away from the person’s face.

More information on the eccentric circle cards can be found here. <https://seeinstereo.wordpress.com/exercises/a-szem-egyutt-mozgasat-segito-gyakorlatok-kozelites-tavolitas/free-space-fusion-cards/>

We consider these two fusion cards drills a foundational drill for NeuroVisual Training and a drill that covers Pillar 1, ocular motor, and Pillar 3, brain training. The drills train the brain and eyes to work better together and to ensure that the brain is getting an image that is fused from both eyes. Please ensure that there are no contraindications when doing these cards for NVT as, if used incorrectly, they could exacerbate pre-existing conditions such as strabismus. Please consult your physician and/or medical control.

Announcements

Check out this new research article regarding the correlation between repeated concussions and skull thickening!
<https://medicalxpress.com/news/2022-09-concussions-thicken-skull.html>

Join UC Berkely’s School of Optometry & Vision Science annual Sheldon M. Golden Conference on Sunday October 2nd, 2022. This year’s focus is on Traumatic Brain Injury. Register at <https://berkeley.us11.list-manage.com/track/click?u=8c355119e9a7439cebff3912a&id=aaccda349b&e=44195bbb66>

As always, if you’re interested in learning more about Inneuractive our mission, our products and service offerings, or just Neuro-Visual Training in general, please click the following link: www.inneuractive.com.

Have suggestions for a future issue? Please reach out to clarkjf@gmail.com or info@inneuractive.com and we will do our best to include your request in the future.

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