FRIENDS OF NEUROVISUAL TRAINING NEWSLETTER. ISSUE 6, VOLUME 1.

July 30, 2020

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Introduction.

In this issue of the Friends of NVT Newsletter, we discuss the accommodation reflex, the importance and function of this reflex, as well as how NVT can be used to help improve the performance of the accommodation process, both pre- and post-injury.

Our “How To” this week is an introduction to Strobe Glasses. A very useful tool that when appropriately included into an NVT program can provide stimulating and challenging progressions to many different exercises.

We also have many important announcements this week! So please check them out at the bottom of this newsletter after reading the NVT content and “How To” sections.

The Importance of Accommodation and NVT.

The accommodation reflex is a reflex of the eyes that responds automatically when switching focus from a near object to a distant object or from a distant object to a near object. This allows you to maintain clear vision or focus while switching between objects at different distances away from the eyes. Accommodation is an important reflex as it occurs very often and is involved within most aspects of the visual experience. For example, when a student is in class listening to their professor and looking at the PowerPoint presentation, then goes to write something down, shifting their gaze from the PowerPoint presentation to their notebook, the ability of their eyes to maintain focus while changing their gaze is the accommodation reflex in action. This example extends into sports as well; when a wide receiver on a football team watches a pass from the quarterback come into their hands, then after the catch quickly shifting their gaze to the nearest opponent to make their next decision, or in baseball when a batter maintains focus on a pitch coming from the pitchers hands across home plate.

But how does accommodation work? There are muscles that surround your lens called the ciliary muscles and when you are looking at an object in the distance, these muscles

are relaxed, which cause the lens to stretch out, manipulating the way light enters your eye. In contrast, when looking at an object close to you, like the notebook in the first example, the ciliary muscles tighten, causing your lens to become rounder and more relaxed.

From a more neuro-perspective, the ciliary muscles that aid the accommodation reflex are innervated by cranial nerve V, also known as the trigeminal nerve. This is known as a reflex because the process of maintaining focus is involuntary and occurs without conscious thought. As we age our ciliary muscles weaken and the lenses stiffen, making our ability to see objects in focus at various distances more difficult. Also, at distances greater than 20 feet humans have very little accommodative power. But is there a way we can train this important reflex?

The beauty of NeuroVisual Training (NVT) is that it can be a tool to help train this accommodation process as well as the other numerous benefits mentioned throughout the previous five issues of this newsletter. The two major exercises we use to train accommodation is through the traditional Brock string exercises using a 10-ft string with 5 beads, and then Near/Far sheets, which is a 10x10 alphanumeric sheet on a standard sheet of paper, taped to the wall, 10-ft away from the participant, while the participant is also holding another 10x10 alphanumeric in their hand that is of smaller font and only takes up half of the standard sheet of paper. These two exercises allow us to engage the participants accommodative system by putting them into situations where they are forced to focus on objects further away and transitioning to closer objects as the exercise occurs.

Now as these exercises are rather standard in a traditional optometry practice, to involve more of the “neuro” in the NVT, we like to make the participant think while performing these exercises. For example, when performing the traditional Near/Far exercise, we will improve the difficulty and engage more neuro processes by hiding words throughout the 10x10 alphanumeric. While reading the saccade, if the participant recognizing a word, we ask them to expressively state that word out loud. There are several other progressions using these exercises that allow us to engage both the accommodation process through switching focus from the Far alphanumeric to the Near alphanumeric, while taking the exercise a step further to elicit neuro processes.

These exercises can have tremendous benefits, as the idea is that you are training your brain to think while accommodation occurs. This can lead to benefits that help with both sports and academic performance. As previously mentioned, the process of a baseball batter tracking the baseball from the pitcher’s hand towards and then across the plate involves the accommodation process as the batter needs to keep the ball in focus. However, there is more to batting than just tracking the ball, even though this is a very important ability. The batter also must be able to tell what type of pitch is coming, and they can do this by how the ball is spinning. If the ball is not in focus, they most likely will not be able to detect the spin of the ball, but if they are unable to optimally think while

also accommodating, then the issue may not be maintaining the focus of the ball, but more so their ability to think while accommodating or multitasking.

After a concussion, athletes have also reported having difficulty with maintaining focus while in the classroom or developing headaches after prolonged periods within class. This sometimes can be deduced to having dysfunction within their accommodation system, and the process of changing focus from the board to their notebook is the source of their headache. As we've mentioned in previous newsletters, NVT is useful for performance enhancement through "prehab", but also useful for rehabilitation post-injury. The previous two accommodation training exercises, among others, are great exercises to help rehab situations like and/or similar this example.

All in all, accommodation is a neurological reflex that is involved in almost every aspect of our daily lives and we have experienced with both nonathlete and athlete patients that NVT can be an effective tool to help improve the performance of the accommodation process, and/or a useful rehabilitation technique upon the unfortunate injury/dysfunction.

"How To": Strobe Glasses.

Strobe glasses are made up of lenses containing LED lights that appear to flash when turned on. Similar to blinking, the flashing produced by the glasses interrupts the light signals entering the eyes. The intensity of the flashing is able to be altered based on the objectives for the patient at hand. We suggest that they are set to "blink" more rapidly in the initial training stages and are gradually slowed as the patient / subject adapts to the training. The slower the interval, the more difficult the task. With a higher degree of LED interruptions, the individual perceives less visual information and is forced to process the limited information they do receive at a faster rate. Note: Strobe glasses do not use frequencies associated with seizure disorder. Always check with a physician to ensure they are safe to use with patients and clients.

Strobe glasses address the third pillar of NVT: brain processing and speed of processing.

Concepts

The simplest concept for the use of strobe glasses is to add them to a standard training regimen as a means of progressing the exercise. For example, if you have someone doing pitch and catch or Marsden ball exercise, and they have become proficient at it; add the strobes. Start with a fast speed with the task (Marsden ball) and slow the strobe frequency as the person gets more proficient.

In our experience the fast frequencies have benefits quickly but those benefits fall off quickly as well. The fast frequency can help in appearing to slow down the field of play.

The overarching concepts with Strobe Glasses & Sports Performance Enhancement: (1) Ensure a safe environment for the athlete to benefit from the strobes, (2) Establish

proficiency with the drill, (3) Start with fast frequency strobes sandwiched between normal activities, and (4) End with normal drill and assess the athletes' perception of benefits post strobes.

Utility of Fast vs Slow Frequencies

Fast Frequency (5-10Hz):

- Tend to be easier to use for athletes
- Tend to have fast on/off washout of benefits
- Provide the perception that things are slowing down
- NOTE: Training at frequencies higher than 10Hz have increased seizure risk.

Slow Frequency (<5Hz):

- Tend to be harder to use for athletes
- Tend to take longer to see benefits
- Benefits seem to (we believe) last longer
- Improves eye discipline and processing of interpretive visual information, such as filling in gaps

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Announcements.

This week's newsletter contains several announcements. First, congratulations to one of our authors, Blake Bacevich, on being named to the 2020 Wuerffel Trophy watch list. The Wuerffel Trophy is known as "College Football's Premier Award for Community Service" and exists to honor college football players who serve others, celebrate their positive impact on society, and inspire greater service in the world. Read the full press release at http://gobearcats.com/news/2020/7/23/football-blake-bacevich-named-to-wuerffel-trophy-watch-list.aspx

Also, we would like to congratulate one of our other authors, Jon Vincent, who will be starting his medical school education at the University of Kentucky College of Medicine where he has been accepted to UKCOM's dual MD/PhD Program. His White Coat Ceremony will be held virtually on Friday, July 31 at 10:00AM EST and can be viewed live using the following link: https://youtu.be/65OJRW9Ci50

Finally, the American Academy of Neurology is hosting is Fourth Annual Sports Concussion Conference. The 2020 Sports Concussion Conference is partnered with the NCAA-DoD Care Consortium program and is occurring virtually this year on Friday, July 31 and Saturday, Aug 1. If interested, more information can be found at the following link: https://learning.aan.com/diweb/catalog/item?id=5274380.

As always, if there are any questions, comments, or concerns please feel free to reach out to Dr. Joe Clark at clarkjf@gmail.com and please visit www.inneuractive.com/friend-of-nvt for more information on NVT, available NVT products, and NVT services.

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