FRIENDS OF NEUROVISUAL TRAINING NEWSLETTER. ISSUE 7, VOLUME 3.

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Introduction.

In this week's issue of the Friends of NeuroVisual Training Newsletter we discuss the importance of decision making for athletic performance. Athletes are required to make an incredible amount of split-second decisions throughout the course of a game and making the correct decision depends on consistent decision-making discipline. Hear from Dr. Joseph Clark on how NVT can be used to train the frontal lobe and enhance this decision-making process.

This week's "How-To" serves as an expansion to our frontal lobe and decision making discussion as its presents three exercises we commonly use in our NVT program; Dynavision, Marsden balls, and Vector balls. The protocols will describe how to use the "red/right, green/left" methodology to target the frontal lobe.

Thank you for your continued support and please be sure to follow us on Twitter @FriendsofNVT!

The Frontal Lobe and NVT

In NVT we talk a lot about being disciplined and go no-go decisions. For example, batting in baseball is a swing no-swing decision, boxers can have a punch no-punch decision and football players have decisions such as stay 'home' or rush along with a host of others. Many of these tasks involve disciplined decision making to make crucial decisions decisively and quickly. Decisions, like pulling a trigger, are irreversible, so it is best to engage higher levels of executive function to make good decisions.

In the human brain, the frontal lobe is a region of the cerebral cortex that contains the motor cortex, Broca's area for language, and the prefrontal cortex. The frontal lobe has a lot of jobs, however, concerning decision making we'll be referring to the prefrontal cortex. The prefrontal cortex is involved in complicated decision making, personality, social interactions, language, and planning; in short a lot of what makes you, your unique self.

Neurovisual training (NVT) that successfully engages the 3 pillars (I1V1) should include tasks that involve and strengthen the prefrontal cortex. If you are doing tasks where decisions have to be made you are 'exercising' the prefrontal cortex. For example, tasks on the dynavision like the reaction test where you must wait until you can act engages the prefrontal cortex to stay disciplined. Also on the dynavision, the red - right and green - left instructions for hitting buttons is a dichotomous decision paradigm that requires planning and decision-making work from the prefrontal cortex. Pitch and catch with squarkle, marsden balls or the batons (I1V2, I2V5) requires the prefrontal cortex to plan how to execute the task, the parietal lobe to aid in short term memory, the motor cortex to execute the task, the occipital lobe to see the objects, and the sensory cortex to assist the motor cortex. If we're doing squarkle where a person has to call something out too, we involve the language regions of the brain as well. Hopefully you see how we are engaging many regions of the brain to do a task of pitch and catch.

Keep in mind all the regions of the brain utilized for a pitch and catch task referenced above. They are prescribed and must be done quickly and correctly. Each task takes a second or two. We default to about 30 throws per NVT session. Let's, by analogy, think about the tasks a defensive lineman has on a football team at the snap of the ball. He will need to wait in a disciplined way for the snap of the ball. He will react quickly at the snap. He must see how the play is developing. He will likely call to his teammates: "PASS" or "RUN". He may have different fielding responsibilities based on the play and have to adjust quickly based on what he sees, recognizes, and decides. Each individual player on the field is required to make these decisions for every play throughout the game. A game will have about 80 snaps in 3 hours. That is 80 sets of high intensity use of the brain,(frontal lobe and prefrontal cortex) for their craft.

We've designed our pitch and catch activities, like squarkle, to engage those same brain regions used almost every snap in football (I1V2). We can practice this simple scenario of 30 reps in about 5 minutes. As we add tasks and accelerate the rate of the pitch and catch, we are (in a controlled way) stressing the system to mirror what that defensive lineman will be called on doing every play of every game. We're training the brain to strengthening the brain regions so they can better work together.

Lastly, it is important to note that if either you are completing the NVT or you are training the athlete for the NVT, the benefits manifest when the drill is taken seriously and you follow the instructions. When the athlete or client is finding and using shortcuts the drill has failed in two ways. One, the prefrontal cortex has made a bad decision to cut corners. Two, the drill will not engage the requisite processing to model what happens on the field. NVT will not transfer to the field if the practice is not taken seriously as the odds are very good that the shortcut that works during NVT will not work on the field. As the old adage states, "practice does not make perfect. Perfect practice makes perfect."

“How To” – Frontal Lobe Training: Red/Right, Green/Left Drills

As a brief recap, the prefrontal cortex is the region of the frontal lobe that is involved with complicated decision making. Synonymous to lifting weights in the weight room, the pre-frontal cortex can be strengthened through NVT exercises that require quick decision making. To continue this discussion of decision making, this weeks’ “How-To” will present three of our favorite frontal lobe training exercises; Dynavision, Marsden Balls, and Vector Balls. While these drills can have numerous variations, when addressing the frontal lobe and decision making, they all follow the “Red/Right, Green/Left” protocol, while the Marsden and Vector balls also incorporate “Blue/Both”. These three drills are great additions to an NVT program as they all require quick and precise decision making along with coordinated motor movement.

Dynavision: Red/Right, Green/Left A*

1. Ensure the patient/athlete can see and reach the entire board as all 5 rings of buttons will be utilized.
2. Run the program for 1-minute and encourage the athlete to hit as many buttons as they can.
3. Throughout the 1-miniute interval, both red and green buttons will randomly light up throughout the board.
4. When a button lights up red, the athlete should hit the button with their RIGHT hand (hence Red/Right).
5. When a button lights up green, the athlete should hit the button with their LEFT hand (hence Green/Left).
6. Throughout the exercise, observe the athletes’ performance and while mistakes will occur, continually reinforce red/right and green/left.

Marsden Balls: Pitch and Catch

1. As the “pitcher”, stand about 25 feet away from the athlete with a box of Marsden balls.
2. Throw “knuckle-balls” directly from the box towards the athlete. The trajectory of the throws can vary while progressing though a box of balls. It is important that the ball is being thrown directly from the box so the athlete cannot cheat the drill and make out the color and shape on the ball before it is in the air.
3. For ball pit balls, note the color of the ball in the air and catch the ball with the correct hand (red=right, green=left, blue=both).
4. For whiffle balls, note the color of the shape on the ball and catch according to the same rules of the ball pit balls. In addition, call out the shape of the ball while it is in the air. If unable to call out the shape while the ball is in the air, call the shape after catching, without looking to see the shape in your hand!
5. Drop the ball into a box and be ready for the next pitch.
6. The time between throws will increase as the athlete gains proficiency in the drill. The eventual goal should be to throw the next ball while the athlete is catching the previous one.

Vector Balls: Pitch and Catch

1. Have two athletes stand about 25 feet away from each other, each with one Vector Balls.
2. Have the two athletes bounce the balls between each other. The closer the ball bounces to the individual catching the ball, the harder the drill. The balls will randomly flash red, blue, or green when bouncer or hit.
3. Instruct the athletes to catch the ball with the right hand if the ball coming at them flashes RED, left hand if it flashes GREEN and both hands if it flashes BLUE.
4. As the athletes gain proficiency, instruct them to catch the ball coming at them, based on the color flashed of the ball they just threw. This will require them to change their gaze and make an even quicker decision as the ball is approaching them.

Lastly, while these three exercises are a great starting point for frontal lobe and decision-making training, always remember to monitor your athlete/client and make decisions to progress or regress based on their proficiency. There are numerous progressions that can be utilized for these exercises; however, a few examples are strobe/pinhole glasses, standing on a half bosu balls, or rhythmic stabilization.

Announcements.

If you are interested in learning how to institute neurovisual training to aid in rehab following sports related concussions check out the course Dr. Clark is offering; June 11, 12 and 13 in Cincinnati Ohio. Register here; World Leaders in Clinical Neuroscience Education - Carrick Institute.

If you've ever considered utilizing strobe glasses as part of your NVT program here is a paper that shows some added utility with strobe glasses.
https://journals.humankinetics.com/view/journals/jsr/30/1/article-p166.xml.

Coming up at ISVA 2021 February 20 and 21 (https://www.isva2021.com/), you can get 2 hours of content concerning how to start and do NVT for sports performance enhancement.

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