

FOCUS

ON SUCCESS

In this third and final instalment of his Persistence of Vision series, **Ed Lyons** looks at alternative methods to enhance our visual system

Occasionally, I will work with a client who has excellent vision and doesn't require prescription glasses or contact lenses, but still exhibits inconsistency with their sight and visual behaviour.

There are also those that do need a form of refractive correction, but that is not the whole story, which is why it's vital to look at the binocular vision status of the client, i.e. how well the eyes work together as a unit.

Sometimes, it can be an eye-muscle defect that causes a certain type of eye dominance issue. Of course, the simplest and most effective way to tackle such an issue is to close an eye, but that's a separate topic for another article. Untreated eye-muscle and focusing disorders can and do cause difficulties in picking up and tracking a clay – particularly the quick transition between two targets at different distances.

A client from last year experienced this phenomenon, and he felt he needed prescription glasses to help with the target clarity and general sensation of "strange vision" he was experiencing.

While there was a tiny refractive error evident, it wasn't significant enough for me to want to prescribe glasses with corrective lenses. It was only by studying his pre-shot routine that we discovered where the problem came from.

In order to help with a case of 'the yips' he had been advised to focus intensely on lining up his cartridges, and only look up once the previous shooter had finished his shot. In Trap shooting, if the shooter prefers to look down while the rest of the squad is shooting, and then looks into the distance just before their turn, their eye-muscles and focusing system may go momentarily offline as they fight to sync up with each other.

We experimented with a different visual routine, picking a distance point away from



A different eye routine can be more effective than prescription glasses



Pencil pushups are a simple eye exercise that can get the eye muscles to work together effectively

the trap house once he was two shooters away from his turn. This meant he wasn't concentrating and worrying about watching too many targets, but had relaxed, "distance-tuned" eyes. He was delighted to discover that this fixed the problem pretty much straight away, and he didn't even need to buy a new pair of glasses!

Muscle training

Sometimes our eyes may struggle to work together because of a motor issue – muscle weakness or over-action. Sometimes the root of the problem is a sensory issue, for example the presence of a cataract in one eye, which was dealt with in the previous article.

Here, we will deal with motor issues. Before any exercise is attempted, it is advised that a full eye examination is carried out to assess suitability, as sometimes training muscles that don't require it can actually induce problems. The eyes are governed by a muscular system, which, like all skeletal muscle groups, is responsive to exercise. In shotgun sports, it's advantageous to have fast eyes that are able to acquire multiple rapidly moving objects, as well as to have fine control in our tracking of the target. There are six extraocular muscles that move each eye, and it is important they work well together to ensure that both eyes are pointing in the correct direction. Each eye

is like a video camera, constantly panning around collecting visual data. Our brain needs to fuse the images our two eyes produce, as this facilitates accurate depth perception and target acquisition. Stress, dehydration, tiredness and age can all lead to a reduction in muscular efficiency and therefore the ability to keep and hold a deep, three-dimensional image. A common problem I encounter in everyday practice is Convergence Insufficiency (CI). This is where an individual has difficulty in maintaining stable binocular vision at close proximity. Even though our sport is performed at distance, weaknesses here can be indicative of overall eye muscle deficiency, which can potentially lead to fixation loss and breakdown over the course of a shoot.

It is important to note that convergence issues can cause problems with reading and computer use at school or work, which can then lead to tiredness and visual stress come shoot day. Tackling this issue to ensure our eyes are as relaxed and rested as possible can be very beneficial.

One client I am currently working on eye muscle coordination with is ace Sporting shot Ryan Sperling. Ryan came to see me last week, and while he was shooting very well, he was aware that his vision could be better.

After my assessment, it was evident Ryan needed a very small prescription to make

each eye sharper, and also needed training to get his eyes to coordinate as a team – his left eye had a tendency to do its own thing on occasion. Having corrected a small amount of short-sightedness and astigmatism with an insert that clipped neatly into his existing Pilla Outlaw frames, we went on to discuss ways to begin vision therapy. We opted for a plan to re-establish accurate eye muscle control with some basic exercises before levelling up in the coming months.

The simplest eye exercises are **pencil pushups**, where the target (often a pencil or other similar object) is slowly brought towards the nose from arm's length while the patient tries to keep it single rather than seeing it splitting into two. If the image splits, this indicates the medial rectus muscles by the nose are unable to pull the eyes in together to follow the moving target.

If the accommodation (focusing power) is adequate then the target should have fine detail. The patient should try to keep the target clear, as well as single. The edge of a 10p coin can be used here, with the patient focusing on the ridges. There is some evidence that more sophisticated exercise regimens have a higher success rate, so we paired the pencil pushups with **jump convergence**. Again, we start with a target held at arm's length. A distant target (text on a TV screen or a clay put at the end

of a room) is then introduced and the patient alternates fixation between the near and distant targets. As they do this, the near target is brought closer in towards the eyes following the same method as stated above.

After two weeks of spending five minutes per day on each exercise, we will move on to the **Brock string**, which is a simple series of beads (usually three to five) on a string of about ten feet in length that the client looks at with both eyes. It demonstrates and measures the effect of eye muscle balance in the brain, and is a powerful tool for helping the patient understand and control their own vision.

During therapy, one end of the Brock string is held on the tip of the nose while the other is tied to a fixed point. The beads are spaced out at various distances. The patient is asked to focus on one of the beads, while noting the visual input of each eye and sensation of convergence. The patient can use various techniques to make focusing easier or more difficult by moving the beads closer to or further from the nose and by employing lenses and prisms.

Although this procedure is usually associated with binocular vision and anti-suppression therapy, it can also be a valuable procedure for developing accurate fixation skills under binocular, two-eyed conditions. The next stage will be to add in vectograms, which are similar to the Magic Eye pictures that were popular in the 90s. This will further help in the development of visual control.

The (very near) future – neurological training

A few years ago, Nike entered the vision training market and brought out the SPARQ vision training station, a \$60,000 state-of-the-art piece of equipment designed to revolutionise the diagnosis and management of sport-related visual anomalies.

They also developed the Vapor Strobe glasses. Created to help train athletes' eyes for improved sensory performance, SPARQ Vapor Strobes featured curved plastic lenses that used liquid crystal displays to create a stroboscopic effect – moving objects appeared to be going in slow-motion. When the difficulty was turned up via controls on the side of the glasses, the strobe became slower, allowing a smaller amount of visual information to come through. This process was called 'visual loading'. The theory behind it was to force the user to make split-second decisions based on a reduced amount of visual data. According to Nike, the glasses helped train six aspects of the athlete's regimen: focus, timing, imagery, reaction time, balance and peripheral vision. The company claimed that 10 minutes of



The Brock string measures the effect of eye muscle balance in the brain

“ In shotgun sports, it's advantageous to have fast eyes that are able to acquire multiple rapidly moving objects ”



The Senaptec Sensory Station assesses ten visual and sensorimotor skills

training a day for two weeks could lead to months of improvement later on.

You may notice that I'm using the past tense here; a few years ago funding was cut and the program was sadly terminated. However, I'm very excited to reveal that a new company was born out of the ashes of the Nike system, and following a conference trip to Utah I have ordered the first of the new Senaptec Sensory Station systems to come in to the UK. Once Ryan has progressed with the basic 'free-space' exercises discussed above, we will graduate on to the Senaptec.

The Sensory Station is a sensory evaluation and training station that assesses 10 visual and sensorimotor skills. In less than 25 minutes, it can determine an individual's strengths and opportunities to improve sensory performance. The system allows benchmarks to be set and creates global comparisons with other users. I am planning to demonstrate it at a major shooting ground very soon and have nine free spaces left for full program evaluations to be taken on the day – for anyone that would like to book, please email me at ed@ed-lyons.com

More information can be found at <https://senaptec.com/sensorystation/>