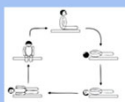


Neuro-Vision from a PT Perspective

Beth Doucet, PT, DPT



Visual Screening



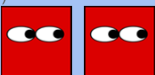
- Where are the symptoms coming from?
 - ◆ Origin of deficits: Central or Peripheral?
 - ◆ Is It a True Visual Deficit or is the Vestibular System Impaired
 - BPPV
 - Vestibular Hypofunction (Unilateral or Bilateral)
 - VOR cancellation, Posterior Head Shake, Head Thrust
 - Red Flags: Valsalva Induced Dizziness, Hyperventilation Induced Dizziness

Oculomotor Nerve

VOR: Produces Compensatory Eye Movements In Response to Head Movements

Posterior Head Shake: Oscillate the Head In a Horizontal Plane to Rule Out Unilateral Vestibular Loss

Head Thrust: Assesses Horizontal Semicircular Canal and Superior Vestibular Nerve with Small Amplitude and High Acceleration Movements (was a compensatory strategy or over correction made?)



Peripheral Dysfunction is Ruled Out and Suspect Central Dysfunction - Now What?

Function, Function, Function!

Compensatory Strategies

Proprioception and Sensory Feedback

Habituation Techniques to Challenge the Entire "System,"

Work Closely with OT and PT and Carry Over Recommendations (can even co-tx if time/insurance allows for it!)



Treatment Options Continued...

Treadmill Drills

Multi-tasking: "What time is It?", Repetition, Head Movements In All Planes

Floor Ladder

Various Sequences, Challenge Balance, Add Speed and Coordination

Challenge Depth Perception and Body Awareness

Mirror for Visual Feedback: Is It More Challenging (Reverse Image) or Helpful?



Grading of Environment

Closed to Open: Inside vs. Outdoors.

Doorways

Obstacles

Sitting or Walking on "Involved" side



Environment Set Up to Challenge Visual Fields to Incorporate Scanning Strategies

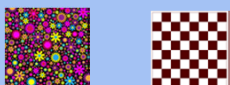
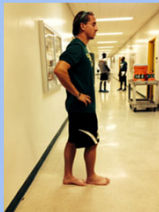
Make It "Personal" to the Person

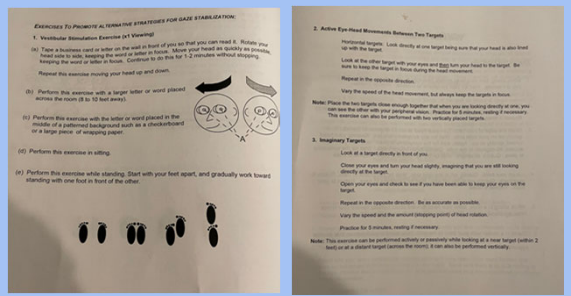
Gaze Stabilization Exercises

VOR x 1 - Sitting → Standing → Tandem

VOR x 2 - Sitting → Standing → Busy environment

Eye Movement → Head Movement → Body Movement



EXERCISES TO PROMOTE ALTERNATING EYE MOVEMENTS FOR GAZE STABILIZATION:

- Visualizer Stimulation Exercise (VOR x 1)**
 - Take a blue marker and color on the side of your eye that you can read it. Rotate your head side to side keeping the word or letter in focus. Move your head as quickly as possible keeping the word or letter in focus. Continue to do this for 1-2 minutes without stopping. Repeat this exercise moving your head up and down.
 - Perform this exercise with a larger letter or word placed across the nose (8 to 12 feet away).
 - Perform this exercise with the letter or word placed in the middle of a patterned background such as a checkeredboard or a target paper.
 - Perform this exercise in sitting.
 - Perform this exercise while standing. Start with your feet apart, and gradually work toward standing with one foot in front of the other.
- Active Eye-Head Movements Between Two Targets**

Horizontal targets. Look directly at one target being sure that your head is also lined up with the target.

Look at the other target with your eyes and keep your head in the target. Be sure to keep the target in focus during the head movement.

Repeat in the opposite direction.

Vary the speed of the head movement, but always keep the targets in focus.

Note: Place the two targets close enough together that when you are looking directly at one, you can see the other with your peripheral vision. Practice for 5 minutes, ending if necessary. This exercise can also be performed with two vertically placed targets.
- Imaginary Targets**

Look at a target directly in front of you.

Close your eyes and turn your head slightly, imagining that you are still looking directly at the target.

Open your eyes and check to see if you have been able to keep your eyes on the target.

Repeat in the opposite direction. Do as accurate as possible.

Vary the speed and the amount (steering point) of head rotation.

Practice for 5 minutes, ending if necessary.

Note: This exercise can be performed actively or passively while looking at a real target (either 2 feet or at a distant target across the room). It can also be performed vertically.

Interdisciplinary Approach

Incorporate Speech and OT into Treatment Plan



We Treat the Person, not just the body part or diagnosis.

PT Role: Integrate and Reinforces Techniques learned in OT and Speech to maximize and generalized Strategies for Optimal Function

"Putting It All Together"

Thank You For Coming!!

Any Questions??



References

Barnes GR. Visual -vestibular interaction in the control of head and eye movement: the role of visual feedback and predictive mechanisms

Clendaniel, Richard. Vestibular Rehabilitation: Function and Treatment of Individuals with Dizziness and Balance Disorders.

Epley JM. The canalith repositioning procedure:for treatment of benign paroxysmal positional vertigo

Herdman SJ. Exercise strategies for vestibular disorders. Ear Nose Throat J
