

Physical Therapy and the Vestibulo-ocular Reflex (VOR)

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Patient Fact Sheet

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What is the Vestibulo-ocular Reflex (VOR) and why is it important?

The vestibulo-ocular reflex (VOR) is a fast, automatic response your brain uses to keep your vision clear when your head moves. It works by moving your eyes at the same speed and in the opposite direction of your head, so what you see stays steady even during fast head movements. This reflex works through signals between your inner ears and your eyes. If the VOR is not working well, because of an inner ear problem, an injury, or normal aging, you may have blurry vision, dizziness, or a feel unsteady when you move your head.

How can Physical Therapy help the VOR?

Your brain can strengthen and train the VOR using specific exercises. This is called adaptation. These exercises typically involve moving your head side to side or up and down while keeping your eyes looking at a target, like a letter on the wall. These head movements should be quick to train the VOR reflex. New research shows that practicing faster, continuous head movements, or even quick, sharp head turns (called impulses), can help the VOR reflex improve even more. These faster movements help the reflex work better in real-life, which keeps your vision clear. It is normal for your vision to get a little blurry during these VOR exercises. This is helpful! The blur ("error signal") tells your brain that it needs to adjust. Over time, your brain uses these error signals to learn and make your vision steadier when your head moves.

Trained physical therapists can do special tests to check how well your VOR reflex is working and find any problems. Using these results, they can create a treatment plan that is right for you, designed to meet your needs and goals.

Why might symptoms get worse at first?

At first, these adaptation exercises may make you feel more dizzy or unsteady. This is normal as long as it is mild to moderate and gets better with rest. It is important to tell your physical therapist about any changes so they can adjust your exercises and move at the right pace.

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Other Important Information about VOR Adaptation

Your physical therapist will slowly make your VOR exercises harder based on how your brain is learning during the training. They may ask you to move your head faster, change your body position (like sitting to standing or standing with your feet closer together), follow a moving object, or practice with busy backgrounds. This helps match the practice with your goals.

Research shows that total amount of practice time is very important to improve the VOR reflex. The more consistently you practice, the more your brain adapts or learns. The good news is research shows the VOR reflex can improve at any age. Even though the inner ear and vision change over time, the brain retains the ability to learn and adjust throughout your life.

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