Vestibular Training Can Be Linked to Healthy Aging

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We are all interested in aging well so that we can have a good quality of life and remain healthier in our later years. Many people are familiar with the problems associated with aging of our senses, such as vision and hearing loss. The vestibular system is another important sensory organ that contributes to healthy aging. It functions to maintain visual stability, balance stability, and cognitive ability (a nice surprise!).

The vestibular system, though it is about the size of a dime, is a major player in coordinating multiple systems in the brain. The semicircular canals are like a gyroscope that tell our body how we are moving in rotational planes. The otolith organs—the utricle and saccule—act as accelerometers, measuring linear motion and tilt angulation of the body. The vestibular organs have connections throughout the brain. The cerebellum is responsible for coordination, the hippocampus is responsible for learning and memory, and the thalamus relays information to the brain. Together, these pathways create an internal GPS of our body's movement in our surroundings.

These regions of the brain together tell the body "What direction am I moving? How fast am I moving? How do I get there?" We use the information just like the GPS systems in our cars or on our phones to help us navigate the world outside our bodies.

Recent research from Johns Hopkins University reveals that a healthy vestibular system is important in supporting spatial orientation, which is a high-level processing of sensory input and cognitive ability. In reality, this means that a weakened vestibular system could contribute to Alzheimer's disease or dementia. Patients with these diseases often show spatial navigation issues that cause them to "wander" or get lost while walking or driving.

So how can a healthy person improve memory, cognition, and navigation? A recent study in Germany used balance training to strengthen the vestibular reactions. The balance training was more effective than relaxation training and cardiovascular training. The training included balancing on one foot while being pulled to one side by an elastic band or balancing on a wobble board while tossing a ball in different directions. Researchers gradually increased the difficulty of these activities over 12 weeks by increasing tension, using a weighted ball, changing to a foam surface, or instructing subjects to close their eyes while performing the tasks. Sound like fun?

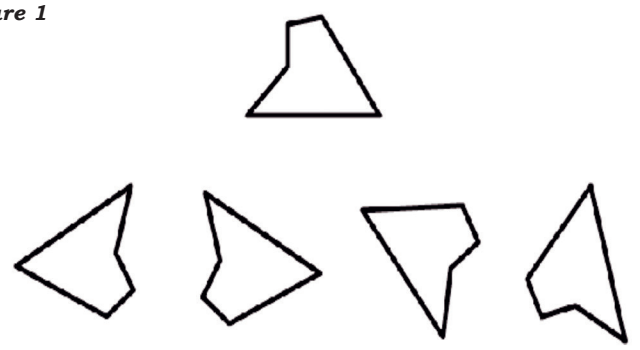
Using cognitive tasks is another way to improve vestibular spatial ability. You might not realize that the vestibular system helps the body orient to sense of vertical and works with our eyes and brain to use mental images to recognize how objects fit together. It also helps us mentally process new directions of how to get somewhere in case of a detour when your planned route needs to be changed.

How about trying these cognitive challenges below:

- Drive using a different route to a familiar place, forcing your internal GPS to work harder.
- Learn a new dance like the fox trot and navigate the step patterns around the dance floor.
- Complete a puzzle that involves spatial ability by using mental images to fit the pieces together.
- Try a brain game app such as **Lumosity**, which provides a variety of games and is a fun way to challenge your cognition.

Try the Card Rotation test: This includes matching an object with 4 objects that has been rotated. This will make you think spatially (figure 1).

Figure 1



Card Rotation Test @ www.aptitudetest.com

Which of the objects at the bottom match the top object?
If your answer is object 1 and 4 you are correct. Objects 2and 3 were flipped and then rotated so they are opposite.

Who knew the vestibular system not only contributes to balance and clear vision but also your cognitive and mental clarity? Strengthening these systems can help you age well! The ability to move about freely and navigate your way are important factors in the quality of life of both younger and older people, and a healthy vestibular system is vital to your freedom of movement and navigation through the world.

A Vestibular Therapist at WWSPT can help you with your goals of healthy aging. Give us a call.