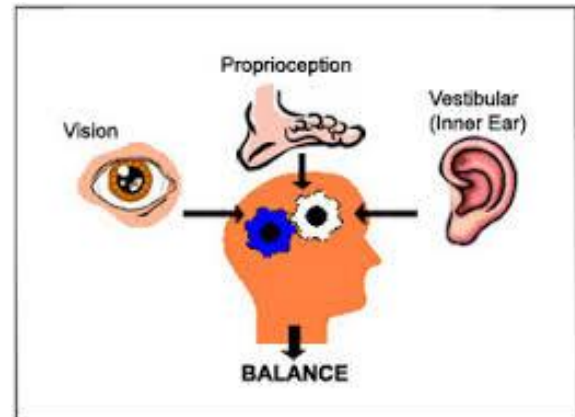


Virtual Reality and Physical Therapy

Virtual Reality (VR) is a new and upcoming technology that gives the user the opportunity to become fully immersed in the atmosphere of their choosing and allows them to interact with the simulation. Using Virtual Reality (VR) as a physical therapy intervention has shown promising positive benefits of increasing balance and gait for multiple neurological conditions that require the same three sensory strategies to function such as Multiple Sclerosis, Parkinson's Disease, and Stroke.¹ One potential option for improving stability and reducing the risk of falls is to focus on training the visual system to be more stimulated and reactive. The idea of using virtual reality systems have shown potential to improve hand-eye coordination and reaction time.

Specifically, in the United States, about one in four adults (28%) age 65 and older, report falling each year resulting in about 36 million falls each year. Aging reduces the number of sensory hair cells in the vestibular end organs. Additionally, there is degeneration of the vestibular ganglion, signal from the otolith organs, and decline in the function of the semicircular canals. From a somatosensory and proprioceptive standpoint, researchers have identified an increase in overall time delay challenging the feedback systems stability, and a decline in the amplitude of the motor feedback. Virtual Reality has the potential to improve stability and reduce the risk of falls by focusing on training the visual system to be more stimulated and reactive.



Benefits of Incorporating Virtual Reality

- Improved Pain Management
- Long Term adherence to therapy
- Increased desire to engage in therapy
- Improved overall patient outcomes

Current Research

Current research has shown that Virtual Reality is a safe and effective form of intervention for older adults with balance issues. Exercise alone does not have as significant benefits on balance and fall risks. The most significant improvement with falls in older adults was seen when Virtual Reality was used concurrently with a multi-component exercise intervention composed of strength, endurance, and balance training. Virtual Reality balance intervention programs have shown to improve balance scores, decrease patients fear of falling, increase lower extremity strength and endurance, and decrease the risk of falls more efficiently than conventional physical therapy rehabilitation programs alone.

A 2015 meta analysis of the use of virtual reality headsets in vestibular rehabilitation found that it may be a useful adjunct to standard vestibular rehabilitation. The researchers analyzed seven studies, and they concluded that the use of VR may be a safe and effective way to improve symptoms of vertigo and balance loss that comes with vestibular hypofunction. The main variable in achieving significant results is the total time spent using the VR device. They found

that patients who were subjected to over 150 hours of VR training over a period of several months seemed to have greater benefits.

Resources:

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