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MATRIC NO: 18/MHS02/008
LEVEL: 200L
DEPARTMENT: NURSING SCIENCE
COURSE TITLE: PHYSIOLOGY
COURSE CODE: PHS212

**SPECIAL SENSES**

## Discuss the physiology of balance

The physiology of balance means the vestibular function. The vestibular system is the sensory apparatus of the inner ear that helps the body maintain its postural equilibrium. The information furnished by the vestibular system is also essential for coordinating the position of the head and movement of the eyes.

The inner ear is responsible for encoding information about equilibrium, the sense of **balance**. Balance is coordinated through the vestibular system, the nerves of which are composed of axons from the vestibular ganglion that carries information from *the utricle, saccule and semicircular canals*. The system contributes to controlling the head and neck movements in responds to vestibular signal. An important function of the vestibular system is coordinating eye and head movements to maintain visual attention. Most of the axon terminate in the vestibular nuclei of the medulla. Some axon project from the vestibular ganglion directly to the cerebellum, with no intervening synapse in the vestibular nuclei. The cerebellum is primarily responsible for initiating movement on the basis of equilibrium information.

Neurons in the vestibular nuclei project their axons to targets in the brain stem. One target is the reticular formation, which influences respiratory and cardiovascular functions in relation to body movement. A second target of the axons of neurons in the vestibular nuclei is the spinal cord, which initiates the spinal reflexes involved with posture and balance. To assist the visual system, fibers of the vestibular nuclei project to the oculomotor, trochear, and abducens nuclei to influence signals sent along the cranial nerves. Finally, the vestibular nuclei project to the thalamus to join the proprioceptive pathway of the dorsal column system, allowing conscious perception of equilibrium.