

NAME: Adeola Temiloluwa

Matric number: 18/MHS02/015

Department: Nursing

PHYSIOLOGY OF BALANCE

The physiology of balance: vestibular function

Balance is mediated by the vestibular nuclei in the brain stem. 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 the movement of the eyes. The labyrinth (a part of the inner ear), is a major organ of our vestibular (balance) system. The three semicircular canals of the labyrinth which respond to rotational movements (angular acceleration); and the utricle and saccule within the vestibule, which respond to changes in the position of the head with respect to gravity (linear acceleration). The information these organs deliver is proprioceptive in character, dealing with events within the body itself, rather than exteroceptive, dealing with events outside the body, as in the case of responses of the cochlea to sound. Functionally these organs are closely related to the cerebellum and to the reflex centers of the spinal cord and brainstem that govern the movements of the eyes, neck and the limbs.

Although the vestibular organs and the cochlea are derived embryologically from the same formation, the otic vesicle, their association in the inner ear seems to be a matter more of convenience than of necessity. From both the developmental and structural point of view, the kinship of the vestibular organs with the lateral line system

The anatomists of the 17th and 18th centuries assumed that the entire inner ear, including the vestibular apparatus, is devoted to

hearing. They were impressed by the orientation of the semicircular canals, which lie in three planes more or less perpendicular to one another, and believed that the canals must be designed for localizing a source of sound in space.

Balance is maintained by the interactions between the labyrinth and other systems in the body, such as the visual and skeletal systems.

The main inputs into the balance system are the

- Vestibular labyrinths
- Visual system (eyes)
- Somatosensory system, especially proprioception

The main outputs from the vestibular nuclei are:

- Vestibule-ocular: permitting reflex eye movements related to the posture
- Vestibule-spinal which supply anti-gravity muscles in the lower limbs and reflex arcs which contain gait