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DISCUSS THE PHYSIOLOGY OF BALANCE.

The vestibular system is the sensory apparatus of the inner ear that helps the body to maintain its postural equilibrium.

Although they have no auditory function, the information they provide is essential in coordination of the position of the head in space and the movement of the eyes. There are 3 end organs in the labyrinth; the semicircular canals (which responds to rotational movements or angular acceleration), and the utricle and saccule within the vestibule, (which responds to changes in the position of the head with respect to gravity). The semicircular canals are three and they are situated above and behind the vestibule of the inner ear and open into it. The utricle is a membranous sac which is part of the vestibule. And the saccule is a part of the vestibule and it communicates with the utricle and the cochlea.

Hair cells are fine specialized epithelial with minute projections that are present in the walls of the utricle, saccule, and ampullae.

The vestibular system is concerned with maintaining balance. Change in position of the head causes movement in the perilymph and endolymph, which bends the hair cells and stimulates the sensory nerve endings in the utricle, saccule, and ampullae. The nerve impulses received are then transmitted to

the form the vestibulocochlear nerve by the vestibular nerve which joins the cochlear nerve. The vestibular branch passes first to the vestibular nucleus, then to the cerebellum. Nerve impulses are sent to the cerebellum from the sensory receptors and the eyes in the skeletal muscles and joints. This means that balance is maintained by interactions between the labyrinth and other systems in the body i.e the visual and skeletal systems.

The main input into the balance system are the;

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

The information that is passed from these three sources to the cerebrum and the skeletal muscles results in independent movements of the head, maintenance of upright posture e .t.c.