

Vestibular System Anatomy & Physiology

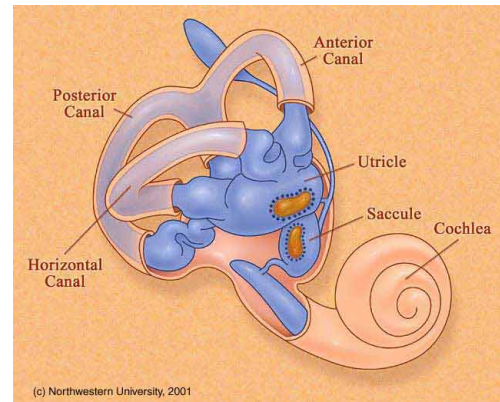
Scott K Sanders, MD, PhD
September 21, 2023

Speaker Disclosure

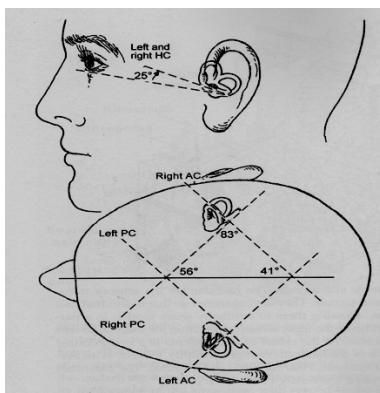
Indiana Hearing Specialists offer the sale of hearing aids manufactured by Oticon, Phonak, Starkey and Resound. Please note all relevant financial relationships have been mitigated.

Basic Anatomy

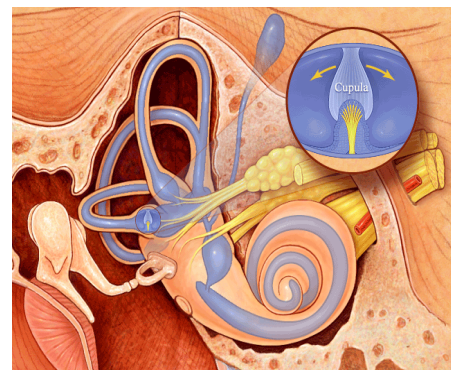
Inner Ear Anatomy



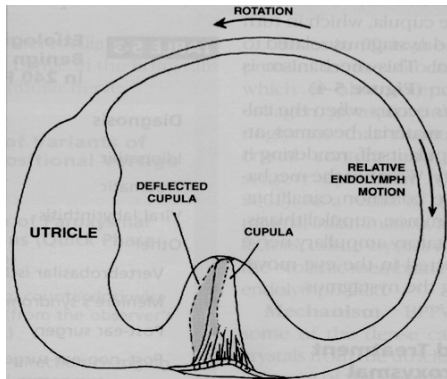
Semicircular Canal Orientation



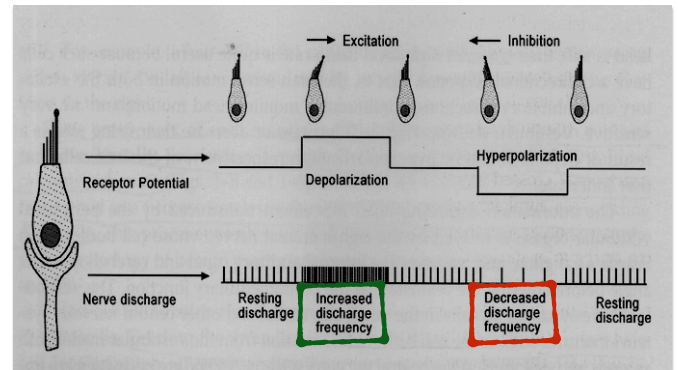
Cupula of Semicircular Canal



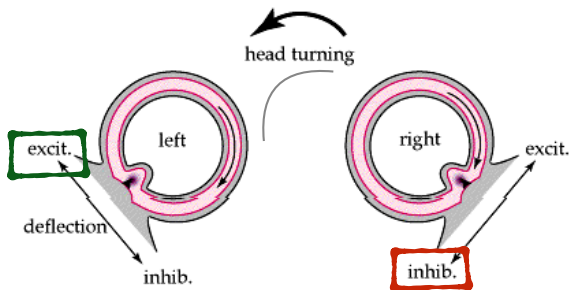
Deflection of Cupula



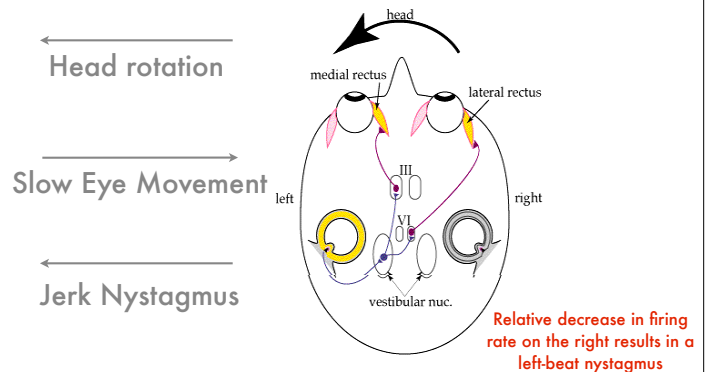
Firing Rate Varies With Head Movement



Excitation vs Inhibition



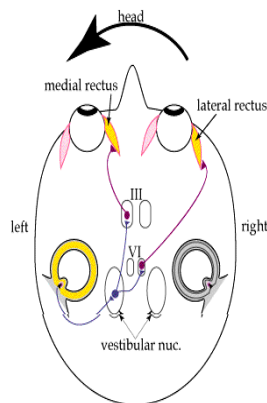
Vestibulo-ocular Reflex



VOR - Vestibulo-Ocular Reflex

Head movement to Left

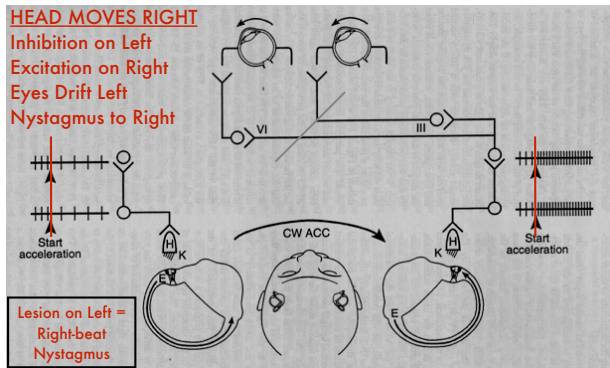
- excitation on left
- inhibition on right
- eyes drift right
- nystagmus beats left



Nystagmus Beats in Direction of Head Turn

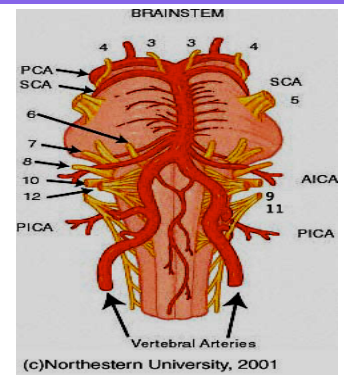


Head Movement to the Right Mimics Lesion on the Left



Vertebrobasilar Circulation

Blood supply to the inner ear comes from AICA (Anterior Inferior Cerebellar Artery)



Inner Ear Circulation

The Labyrinthine artery is a branch of AICA and is small enough that ischemia to the inner ear structures affects both the auditory and vestibular components

