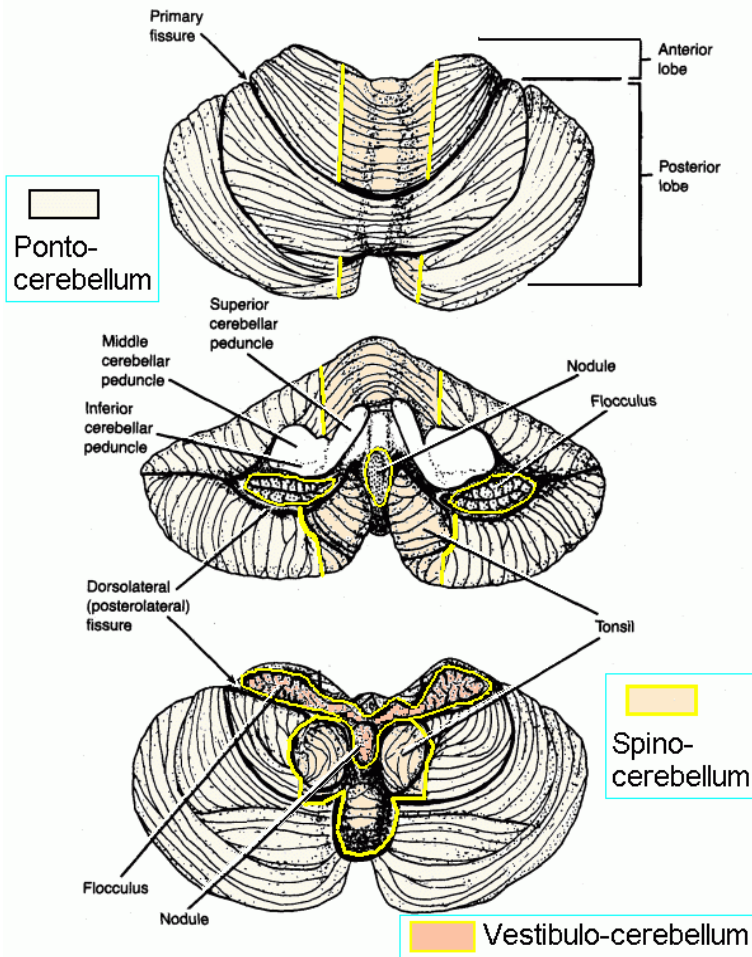


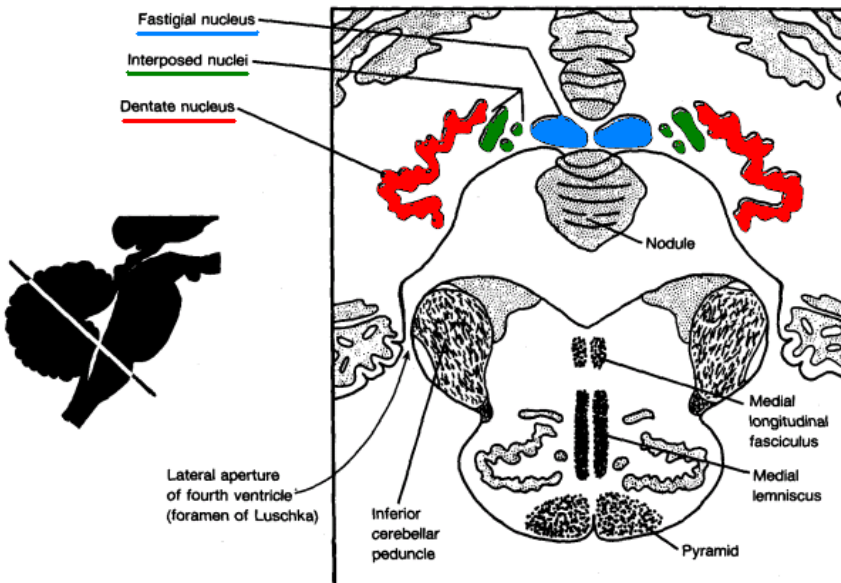
# CEREBELLUM

Landmarks and functional divisions of the cerebellum



The cerebellum has a plethora of names and connections. It develops later than the cerebral cortex, as an outgrowth from the embryonic brain stem. The cerebellum integrates motor commands (sent from the vestibular nuclei and cerebral hemispheres to the brain stem and spinal cord) with sensory signals (notably vestibular and proprioceptive).

The cerebellum compares the motor commands with the the current sensory input (position of the head in space, lengths of muscles, tension in tendons and positions of joints) and sends out modifying instructions to the sources of the motor commands. The result is smoothly coordinated movement.

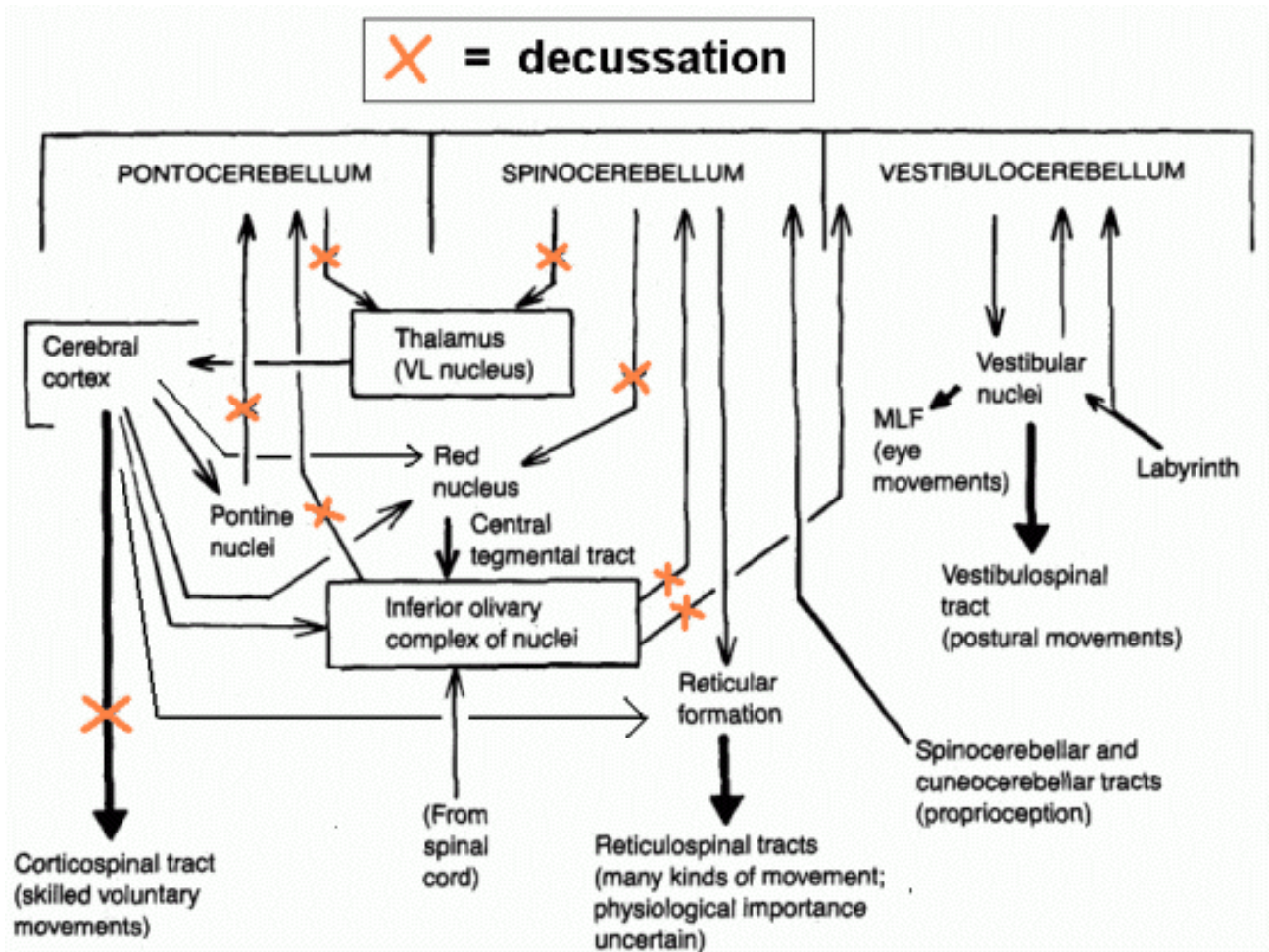


Fastigial nucleus for the vestibulocerebellum

Interposed (globose and emboliform) nuclei for the spinocerebellum

Dentate nucleus for the pontocerebellum

## Cerebellar connections



## Principles

1. Vestibular system has ipsilateral connections with the labyrinth, cerebellum, spinal cord and ocular motor subnuclei for muscles that move both eyes. [Also a crossed projection to thalamus, then parietal cortex.]
2. Proprioceptive pathways to the cerebellum (spinocerebellar and cuneocerebellar tracts) are from the same side of the spinal cord.
3. Cerebral cortex (nearly all of it) sends signals to contralateral cerebellar hemisphere, by way of relays in ipsilateral pontine and inferior olivary nuclei. (Ponto- and olivocerebellar fibres decussate.)
4. Output of the spino- and pontocerebellum is mostly by way of the superior cerebellar peduncle to the contralateral thalamus (VL nucleus), which projects to the primary motor area (precentral gyrus).  
[Cerebellothalamic fibres decussate at the level of the inferior colliculus.]