

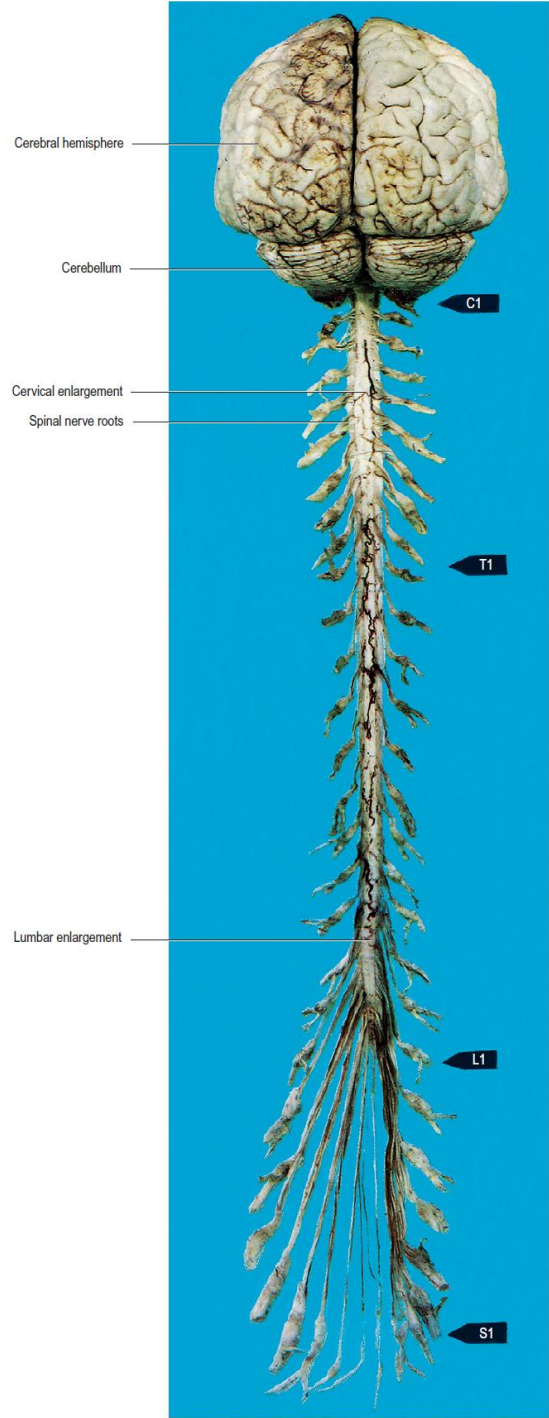
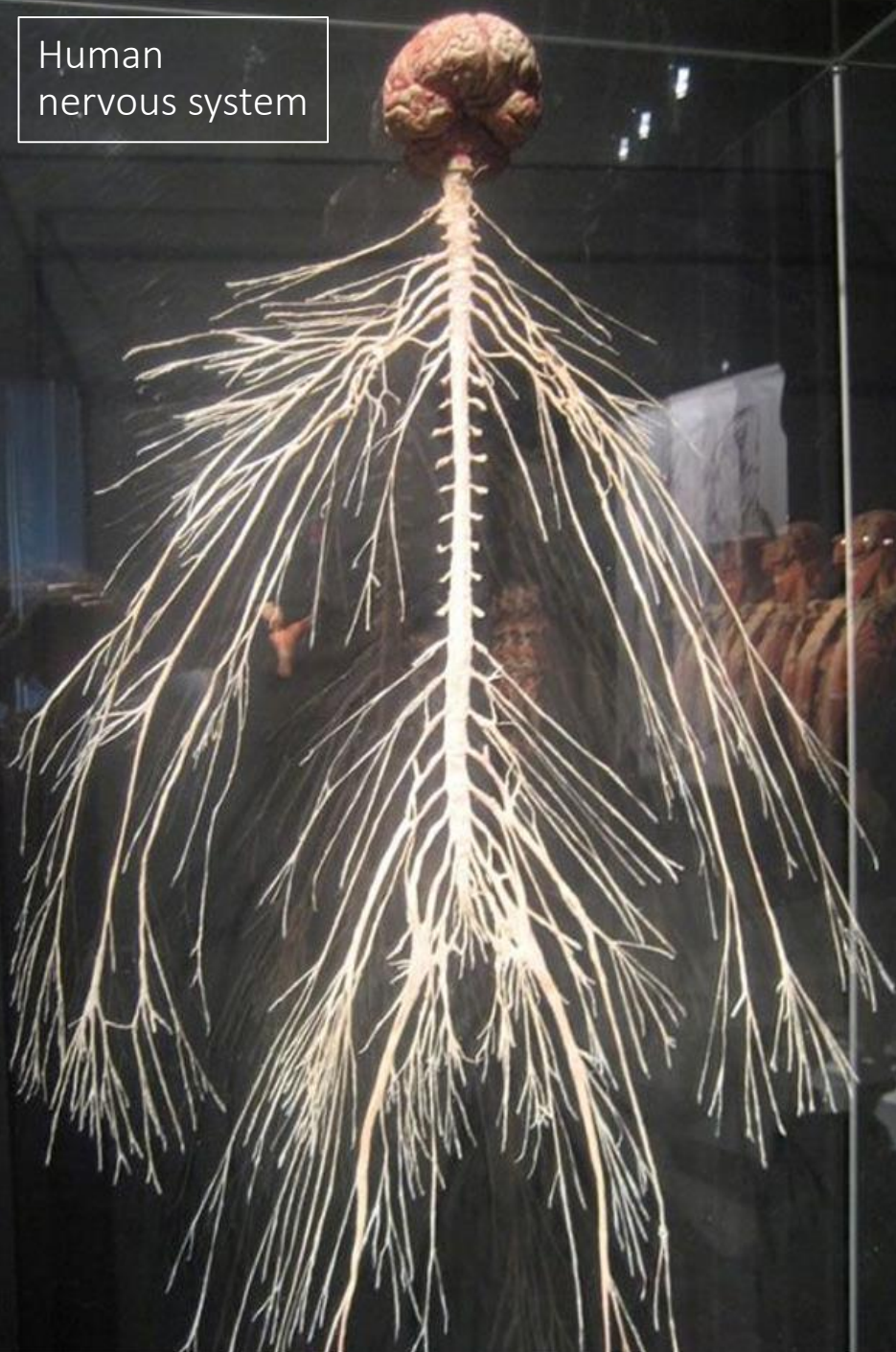
# Neuroanatomy-1: Introduction (figures)



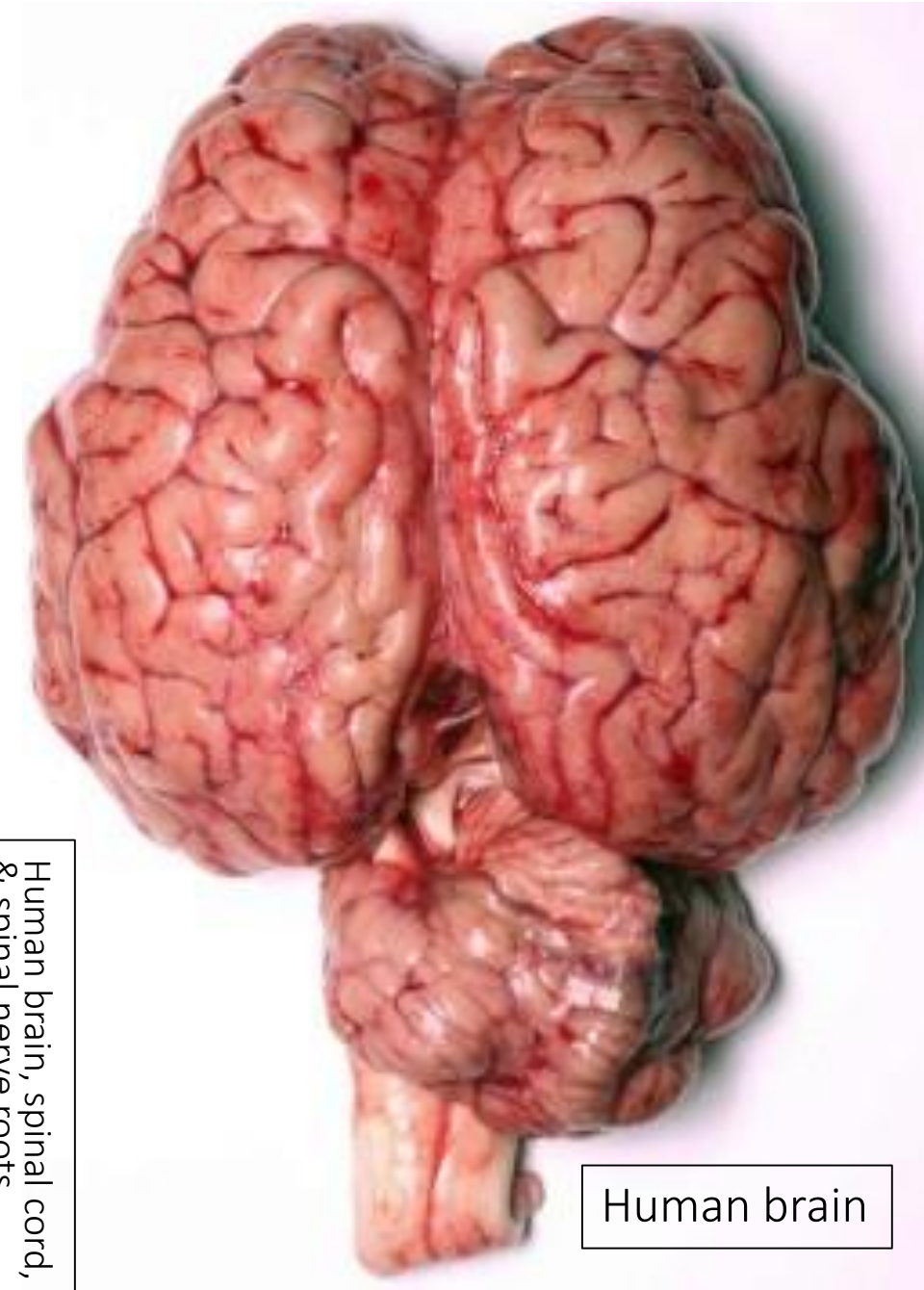
Dr. Ali Mohsin

(M.Sc., Ph.D. Anatomy,  
Histology & Embryology)

Human nervous system



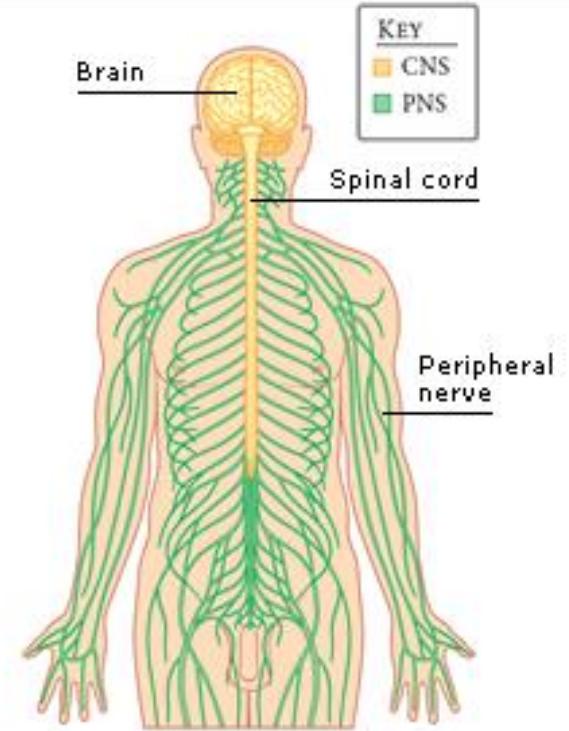
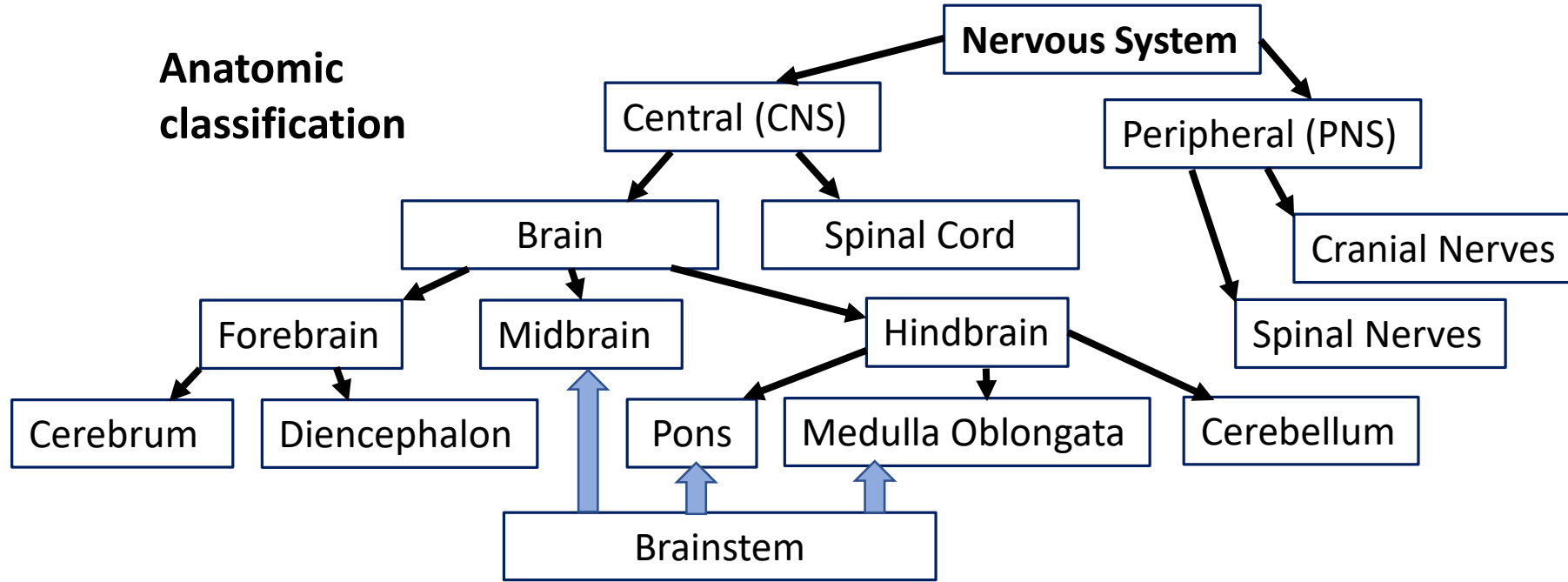
Human brain, spinal cord, & spinal nerve roots



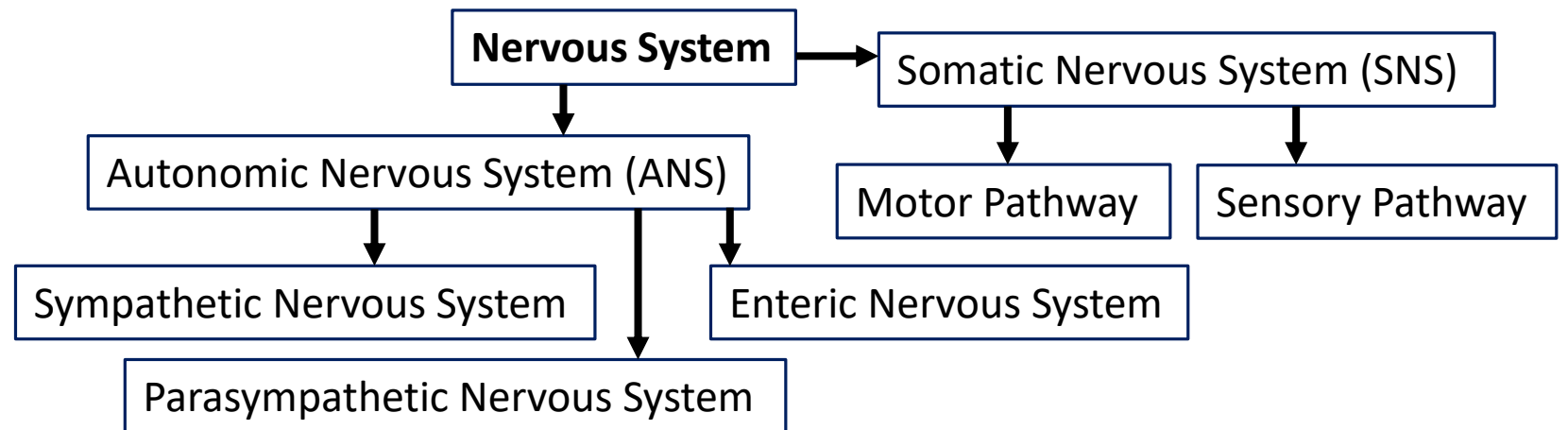
Human brain

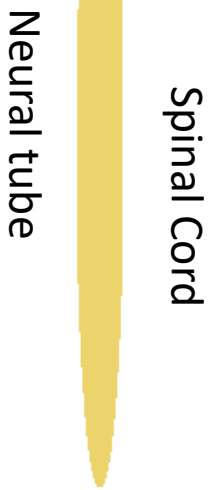
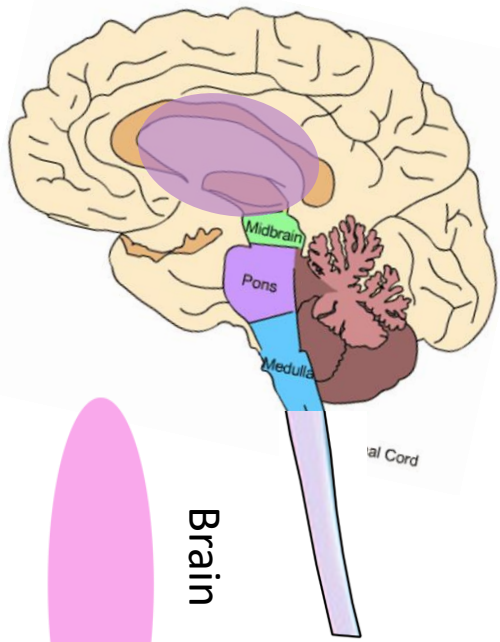
# Nervous System Classifications

## Anatomic classification

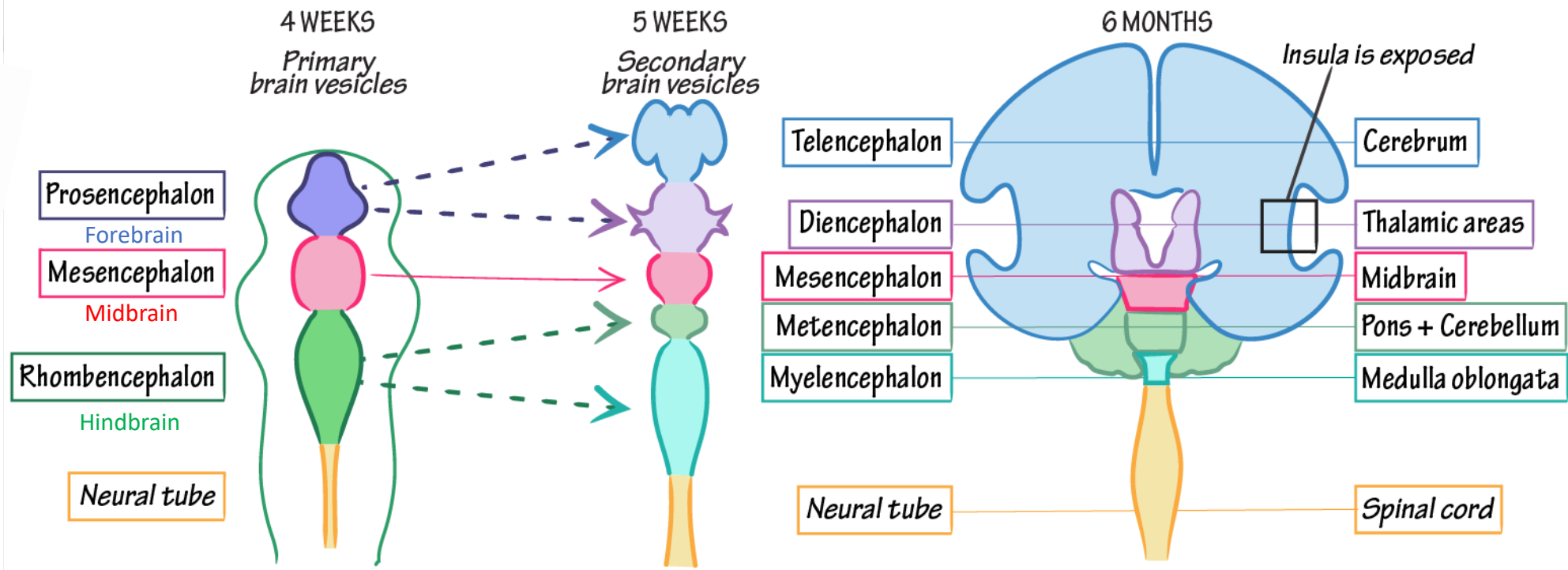


## Functional classification

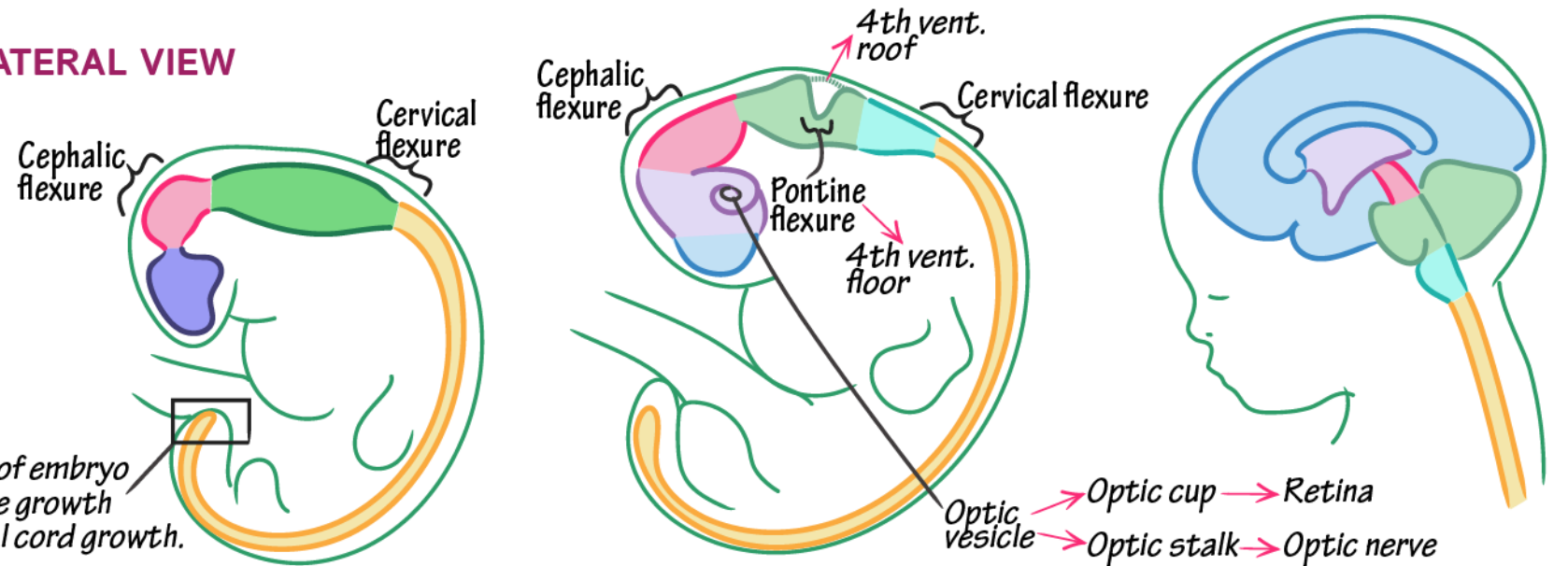




### CORONAL VIEW

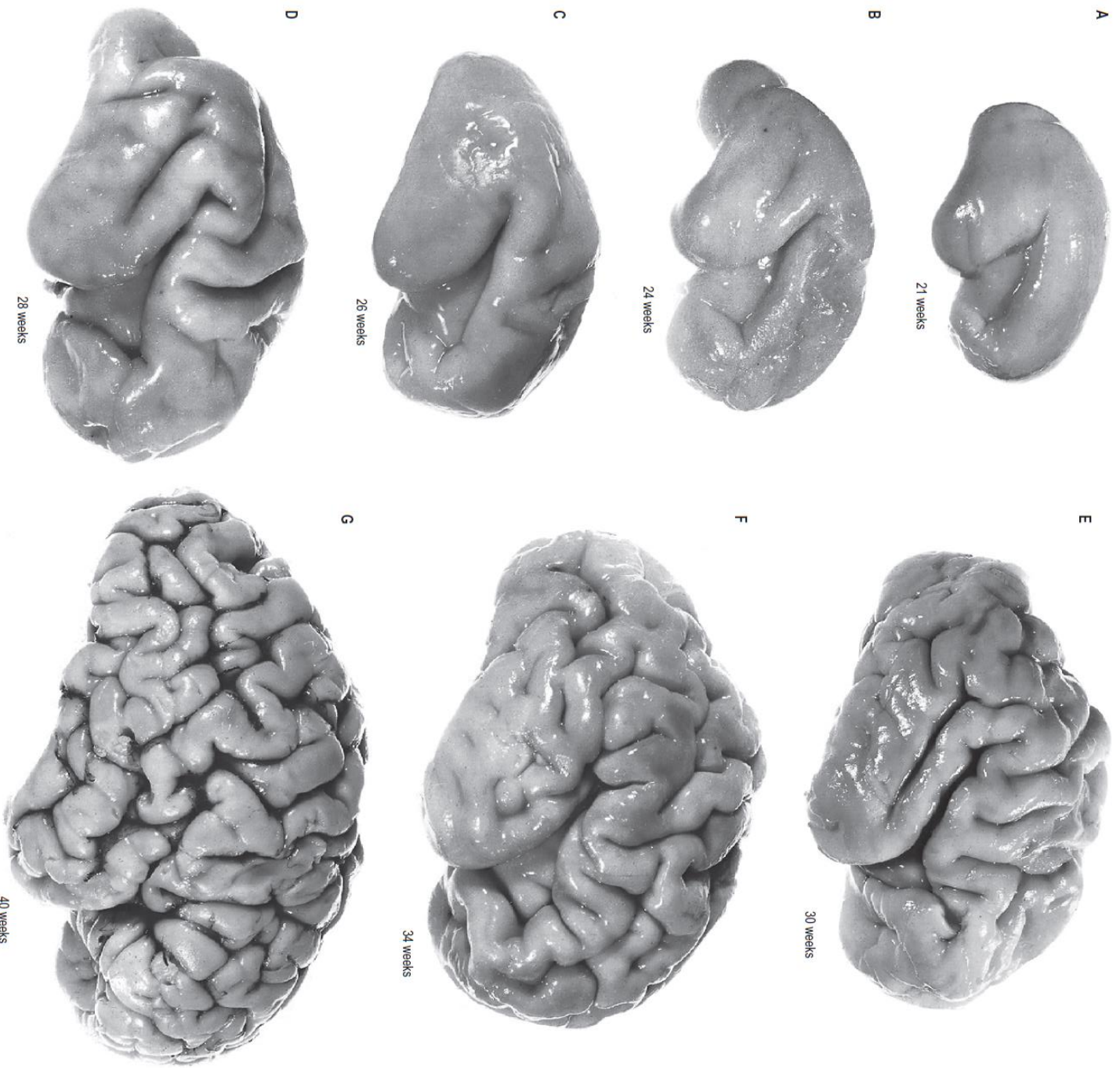


### LATERAL VIEW

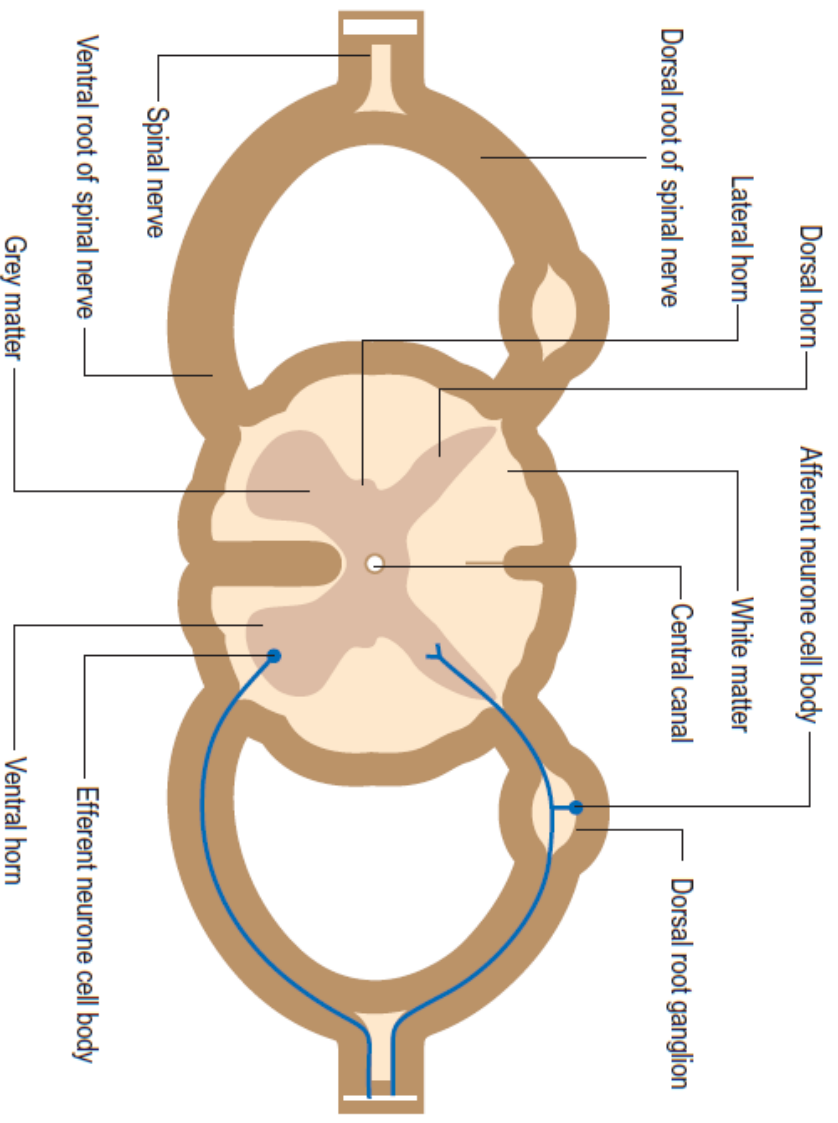


Neural tube runs length of embryo until month 3 when spine growth starts to outpace spinal cord growth.

CNS development

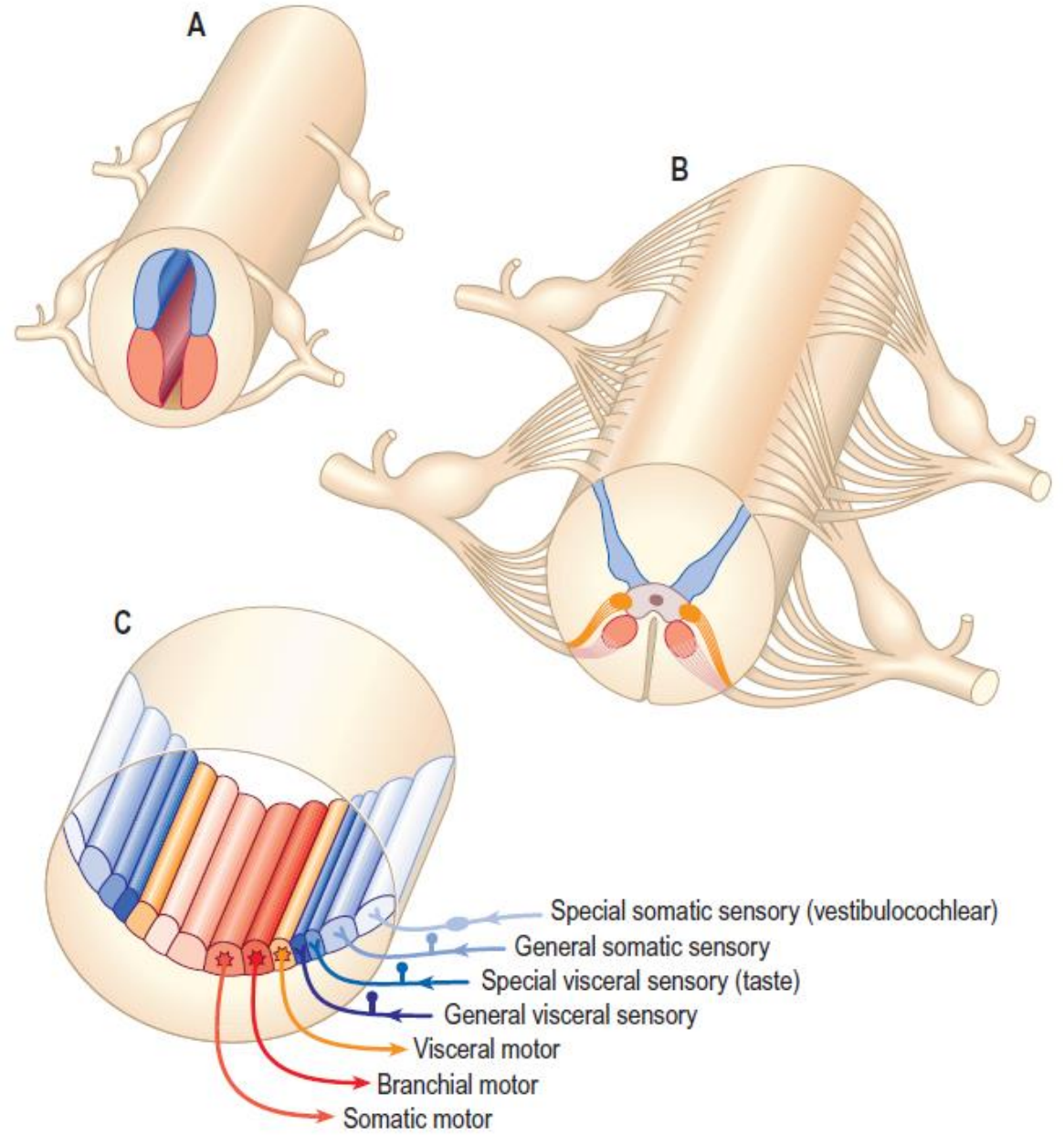
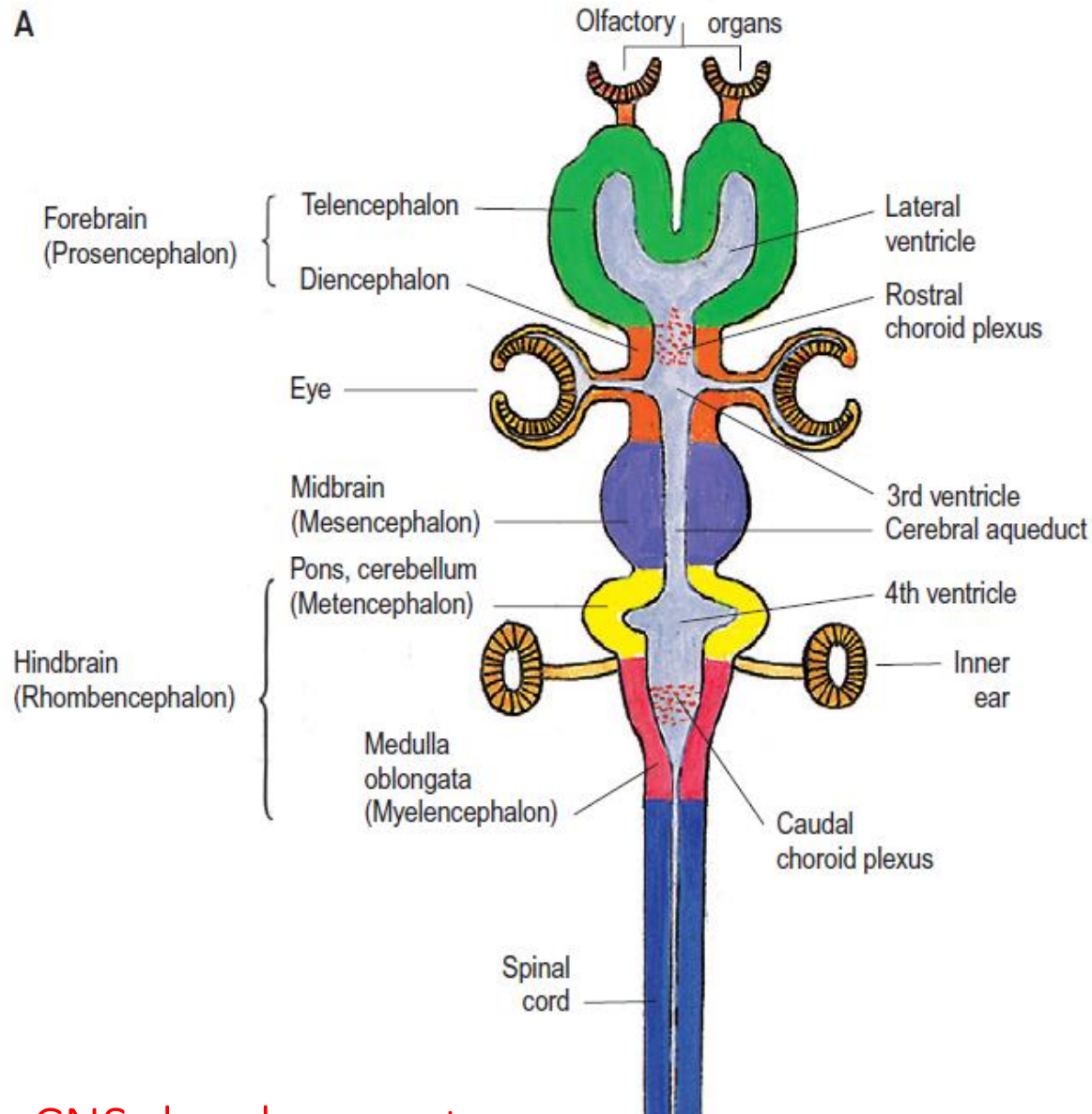


**Fig 3.31** A–G, Superolateral surfaces of human fetal cerebral hemispheres at the ages indicated, showing the changes in size and profile and the emerging pattern of cerebral sulci with increasing maturation. Note the changing prominence and relative positions of the frontal, occipital and particularly temporal poles of the hemisphere. At the earliest stage (A), the lateral cerebral fossa is already obvious; its floor covers the developing corpus striatum in the depths of the hemisphere and progressively matures into the cortex of the insula. The fossa is bounded by overgrowing cortical regions—the frontal, temporal and parietal opercula—which gradually converge to bury the insula; their approximation forms the lateral cerebral sulcus. By the sixth month, the central, pre- and postcentral, superior temporal, intraparietal and parieto-occipital sulci are all clearly visible. In the subsequent stages shown, all the remaining principal and subsidiary sulci rapidly appear, and by 40 weeks (G), all the features that characterize the adult hemisphere in terms of surface topography are present in miniature. (Photographs provided by Dr. Sabina Strick, The Maudsley Hospital, London.)

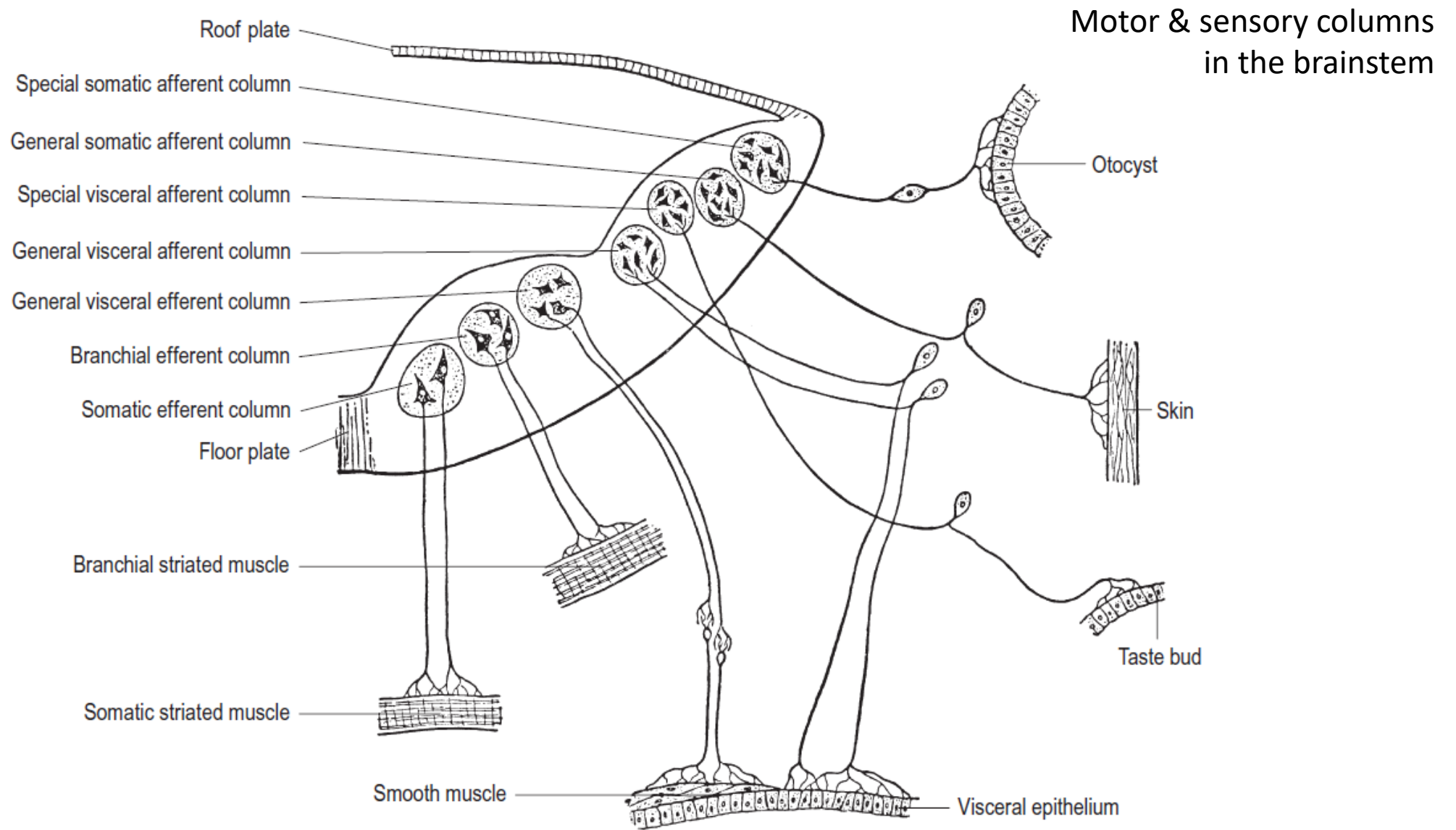


# CNS development

A

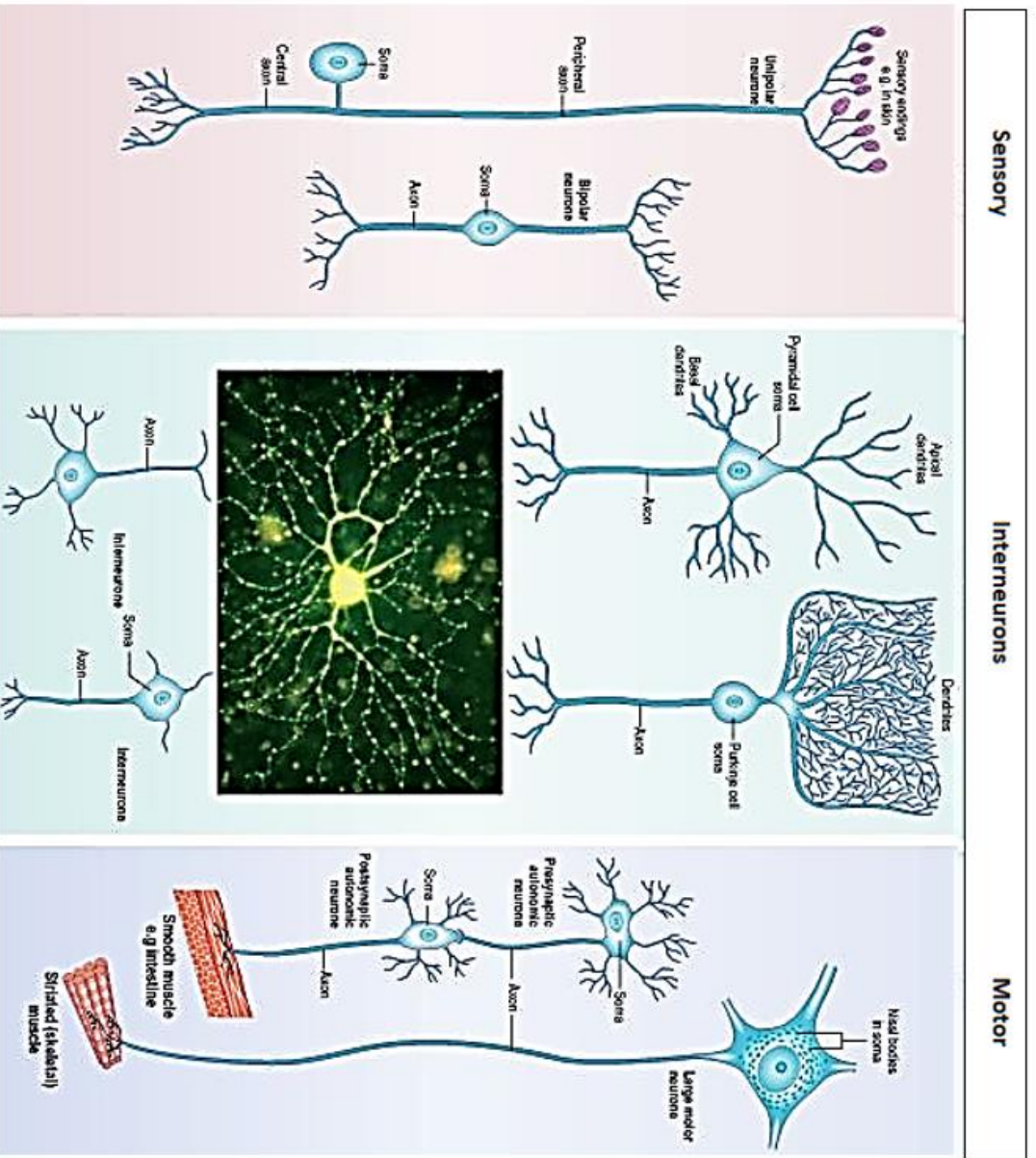
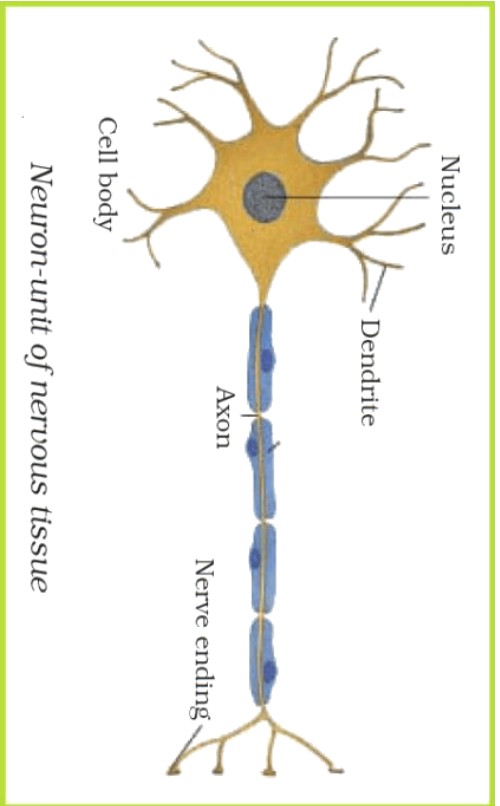
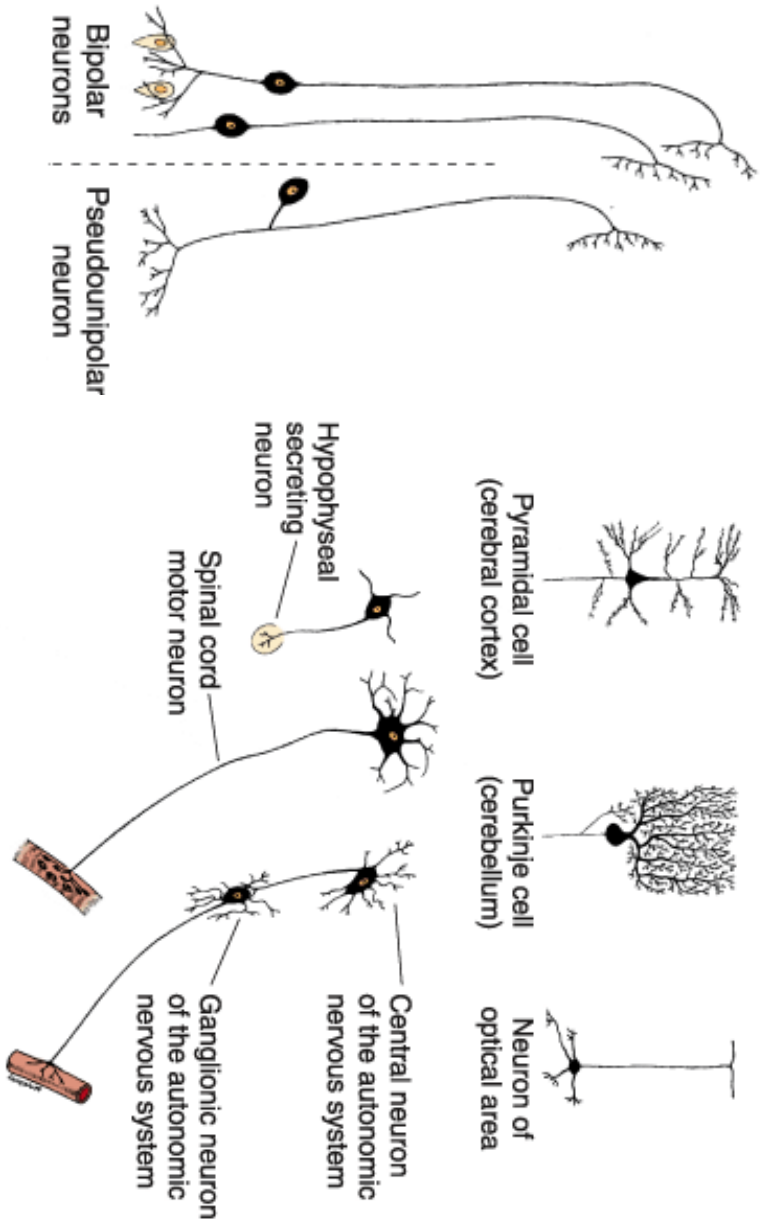


CNS development



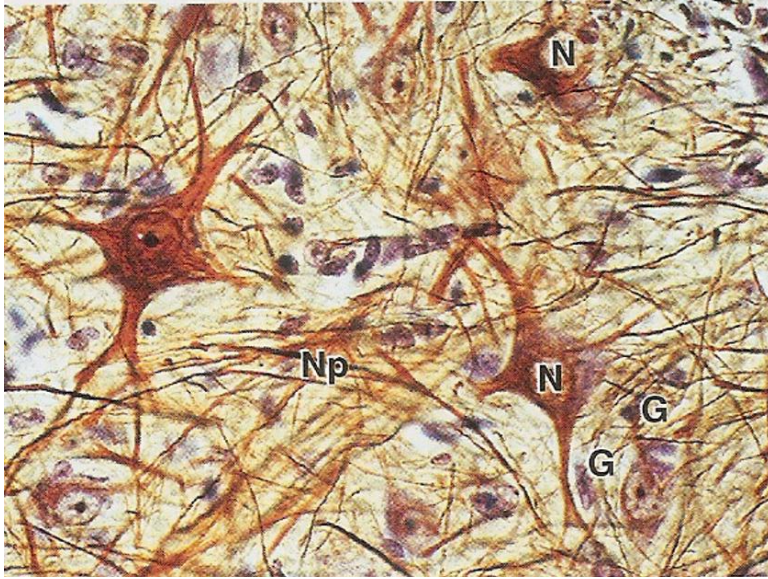
**Fig. 3.22** Transverse section through the developing hindbrain of a human embryo, 10.5 mm long, showing the relative positions of the columns of grey matter from which the nuclei associated with the different nerve components are derived. Postganglionic neurones are associated with the general visceral efferent column, bipolar neurones are associated with the otocyst and unipolar afferent neurones are associated with the other alar lamina columns.

# Neurons: parts, morphological & functional classifications

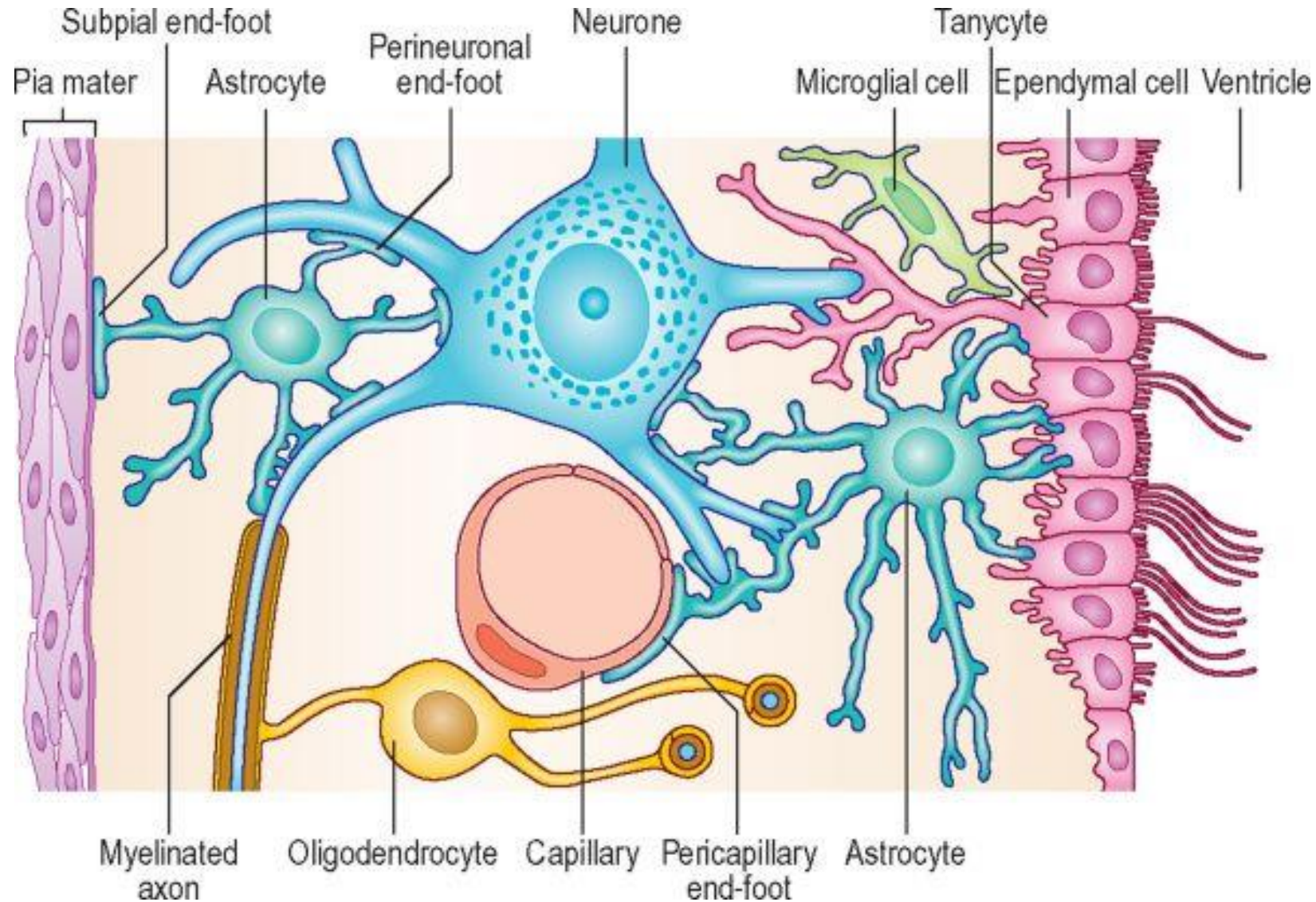




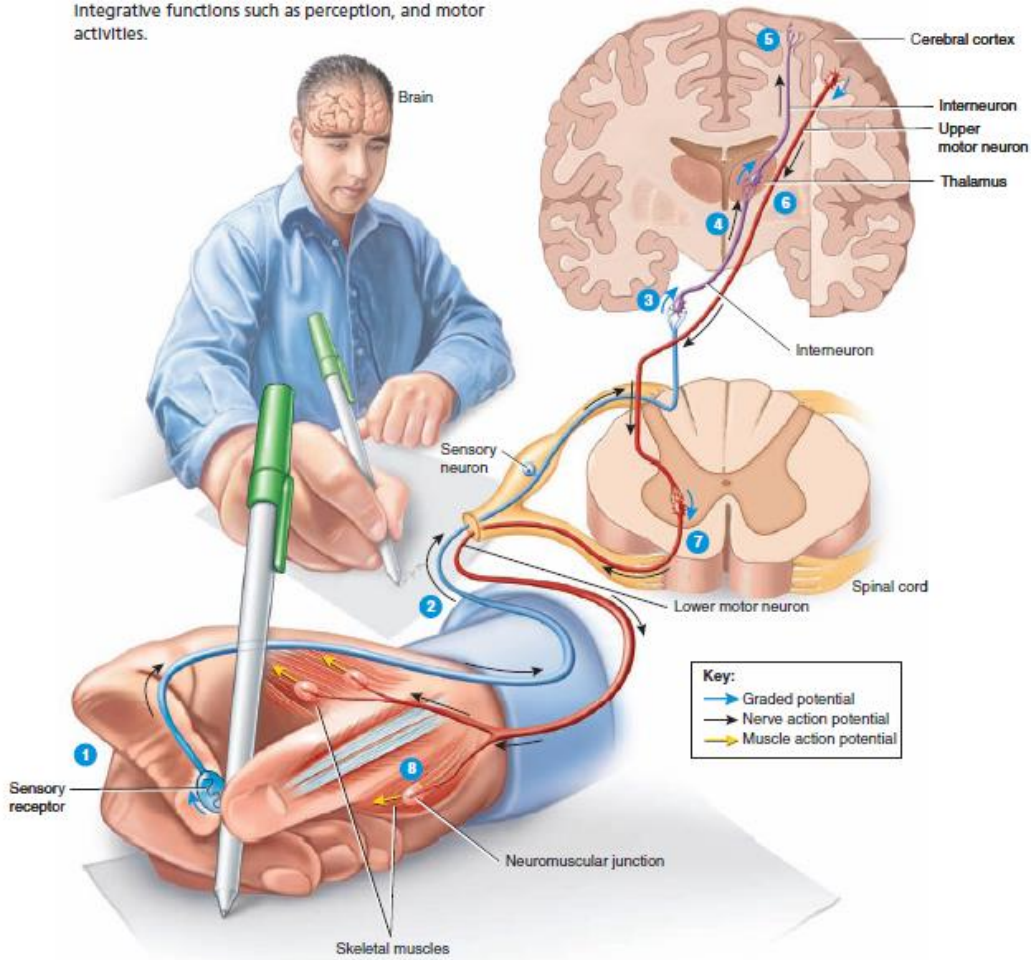
- Glial cells: supportive cells to the neurons.



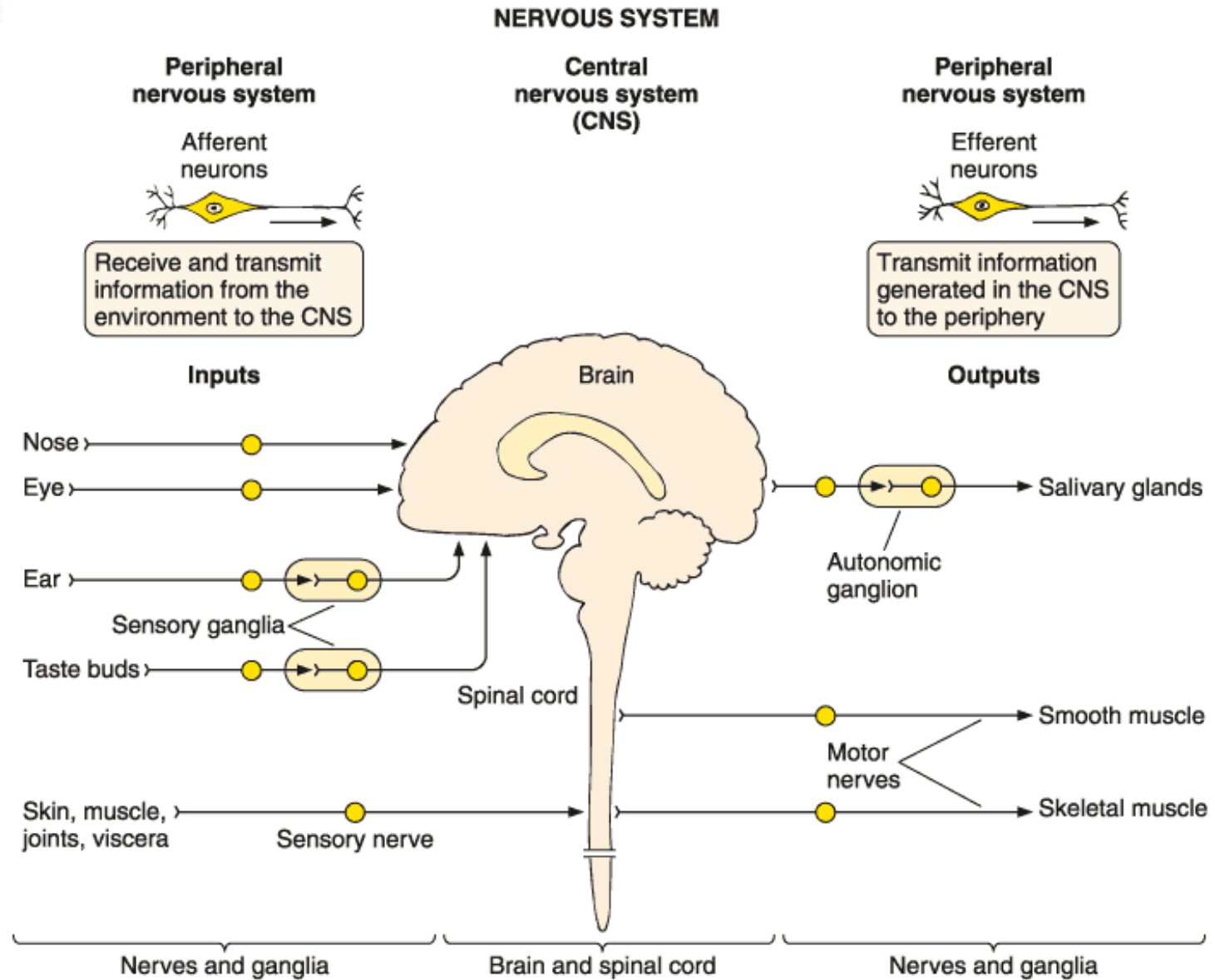
Nervous tissue. N: neuron, G: glial cells, Np: neuropil (dendrites & axons)



Integrative functions such as perception, and motor activities.

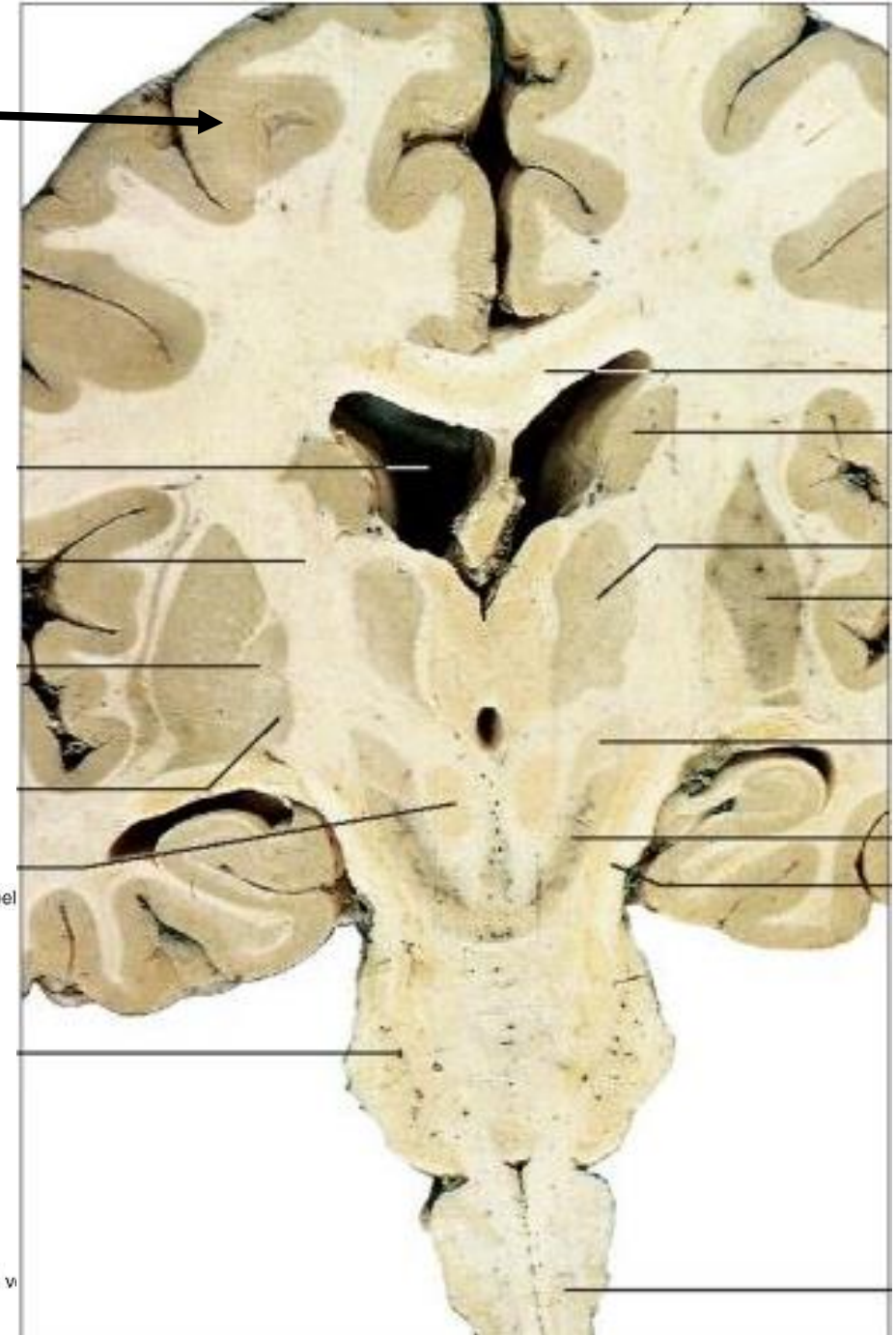
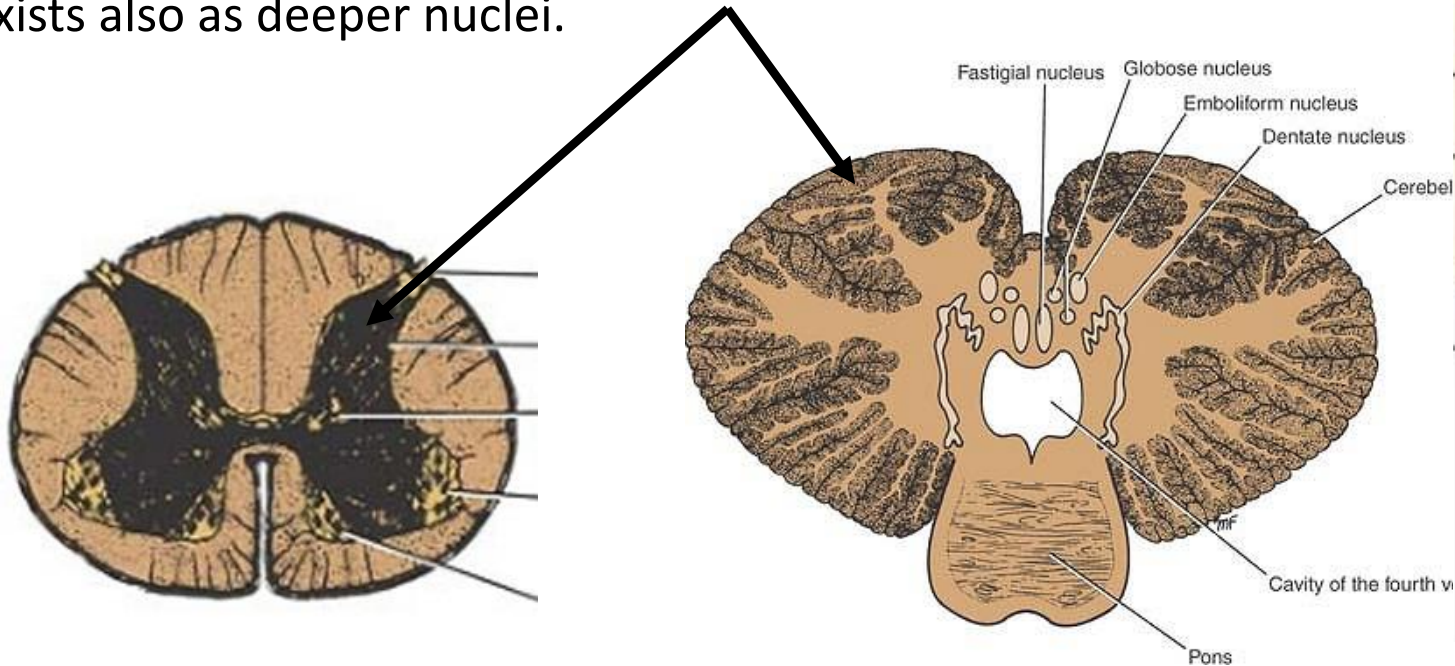


# Nervous System Function



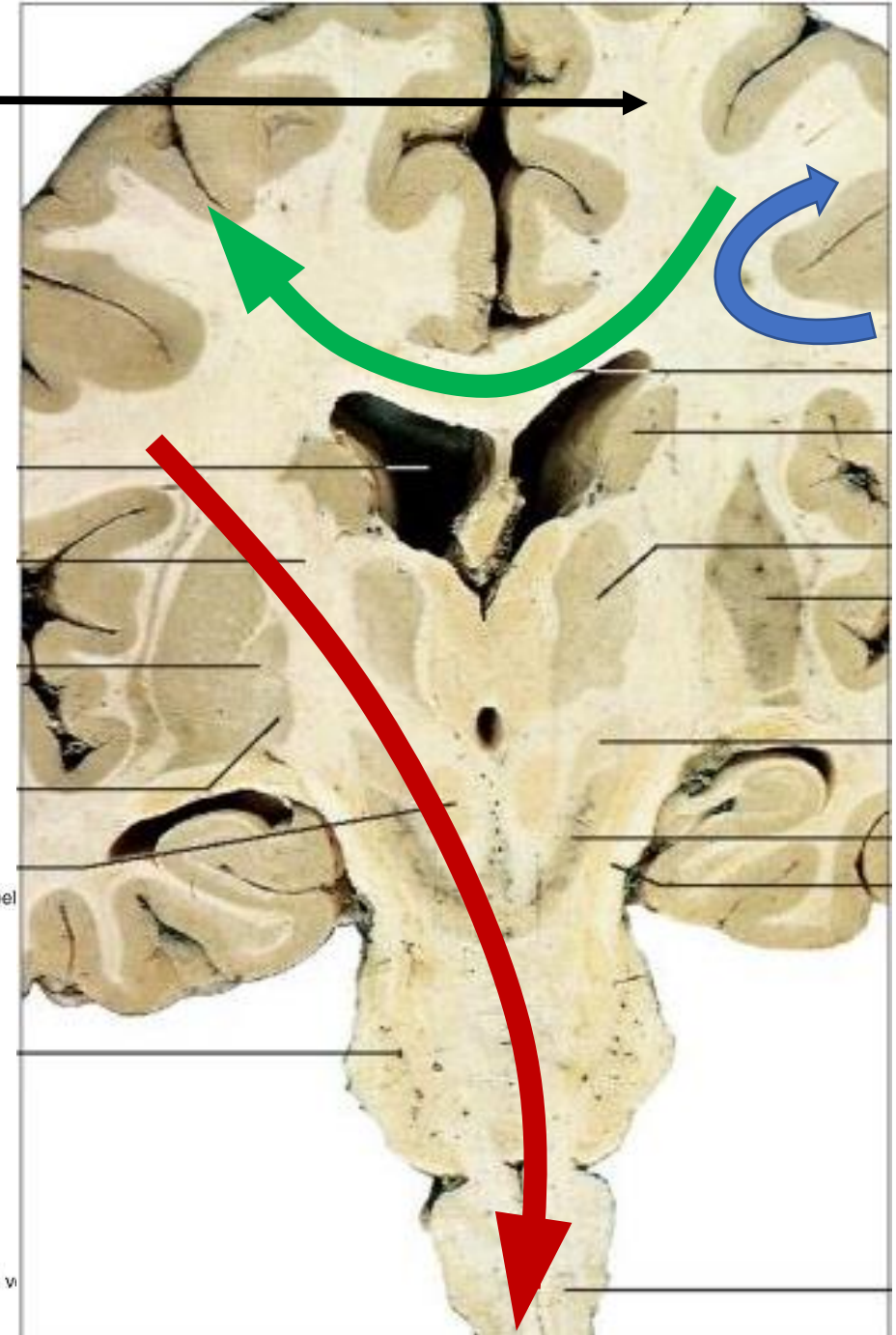
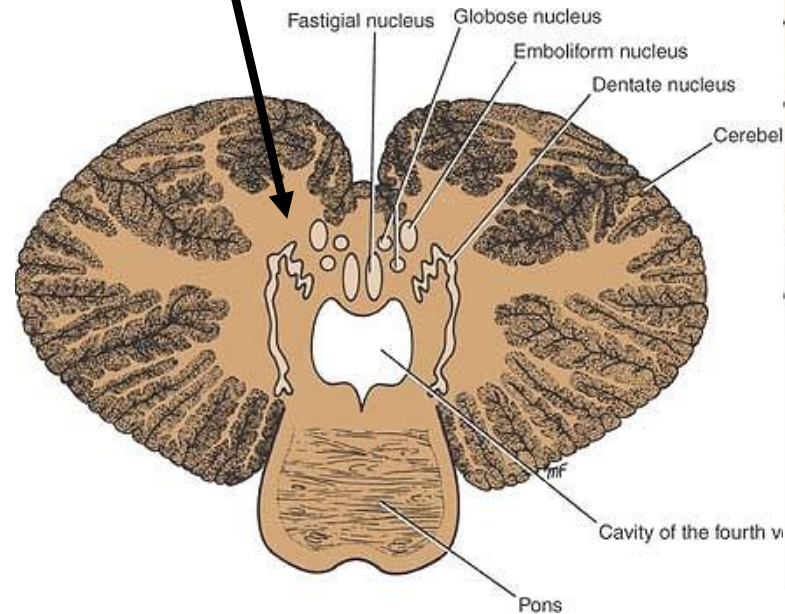
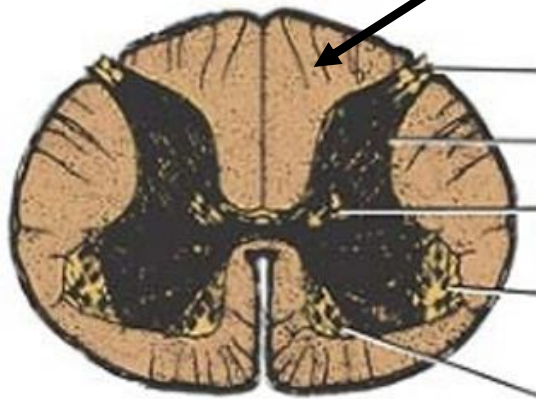
# Grey matter

- The grayish zone of the CNS. It consists of a huge number of neuronal bodies (perikarya) & dendrites, glial cells, & the initial unmyelinated segments of axons.
- It occupies the outer zone (cortex) of the cerebrum & cerebellum, & the inner zone of the rest of the CNS.
- The thickness of the cortex varies from 1.5 to 4.5 mm. being thickest over the crest of a gyrus and thinnest in the depth of a sulcus.
- Exists also as deeper nuclei.

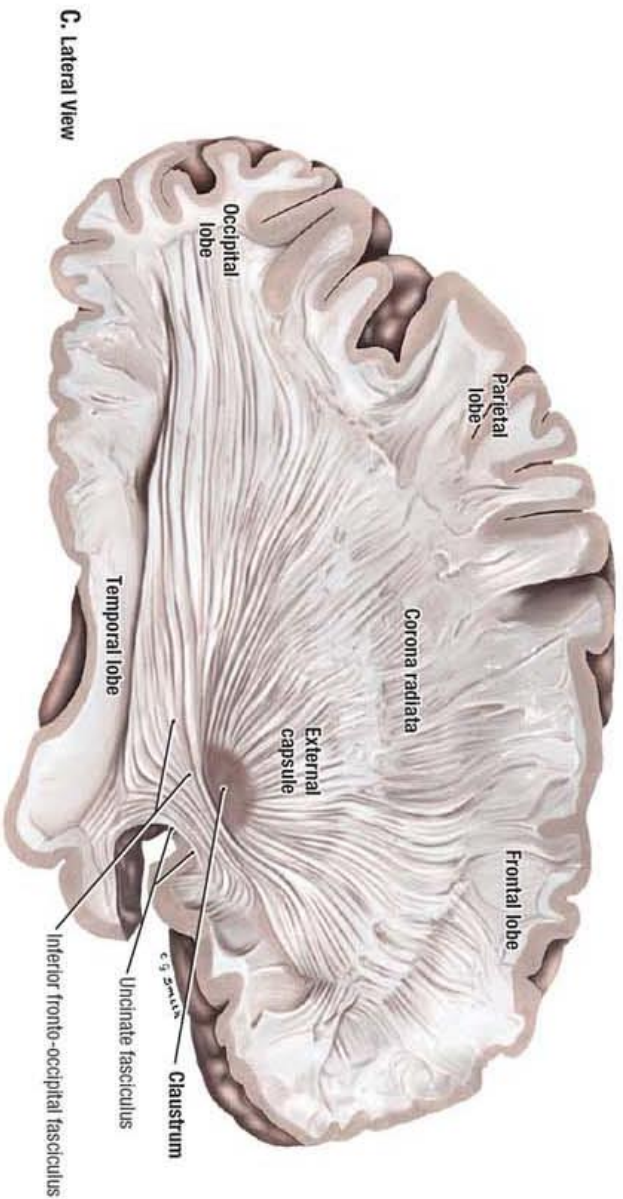


# White matter

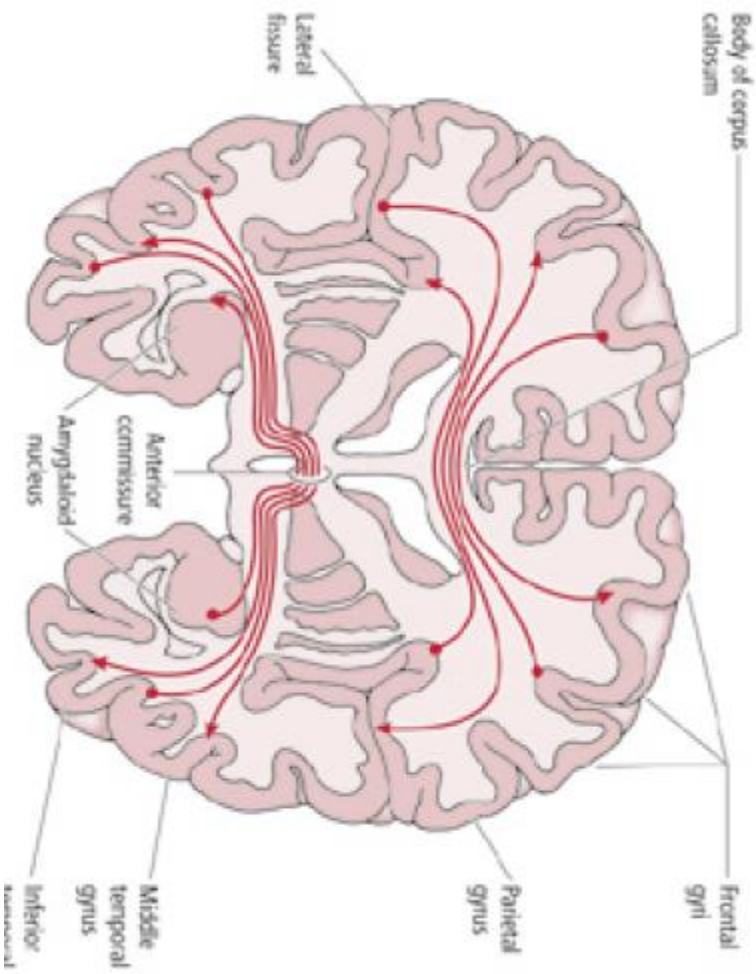
- Whitish part of the CNS. It consists of aggregation of (myelinated) nerve fibers (axons) & glial cells. No perikarya (cell bodies).
- It occupies the interior of the cerebrum & cerebellum, & the exterior of the rest of the CNS.
- White matter fibers:
  - Association fibers (blue arrow)
  - Commissural fibers (green arrow)
  - Projection fibers (red arrow)



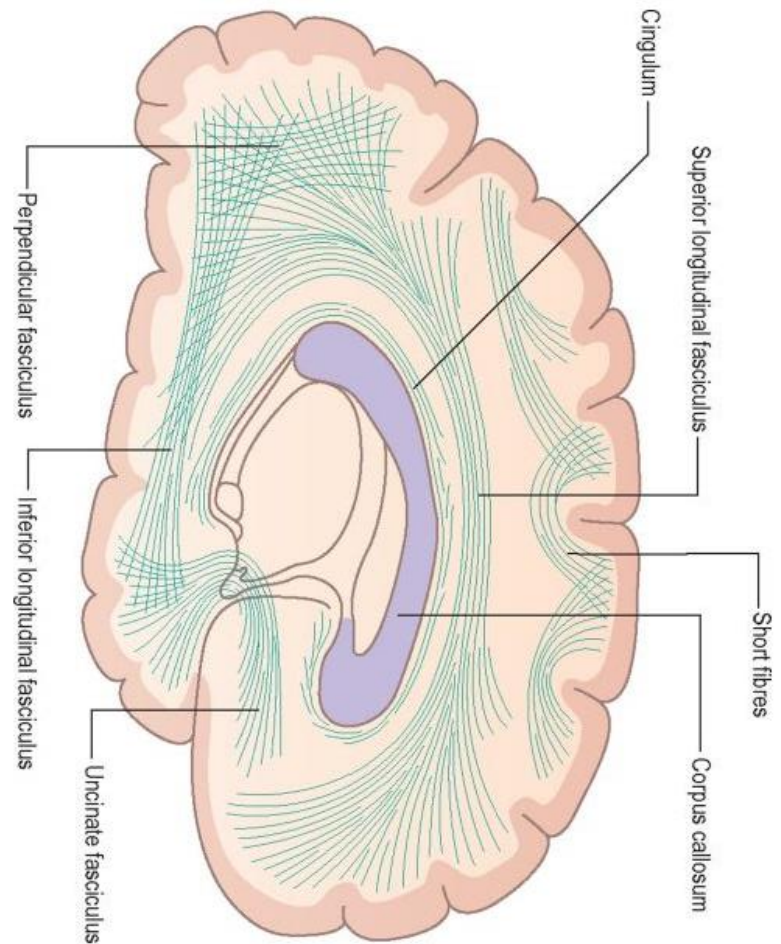
# Projection Fibers



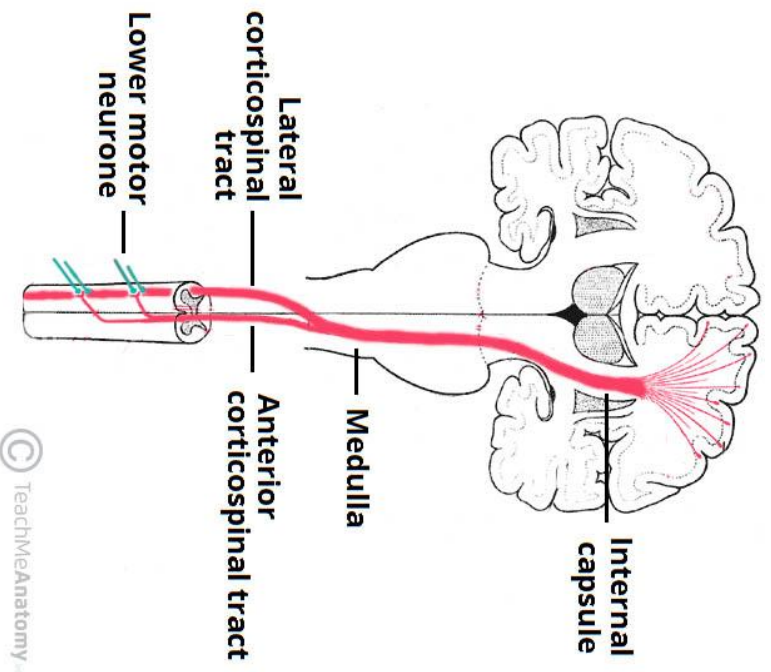
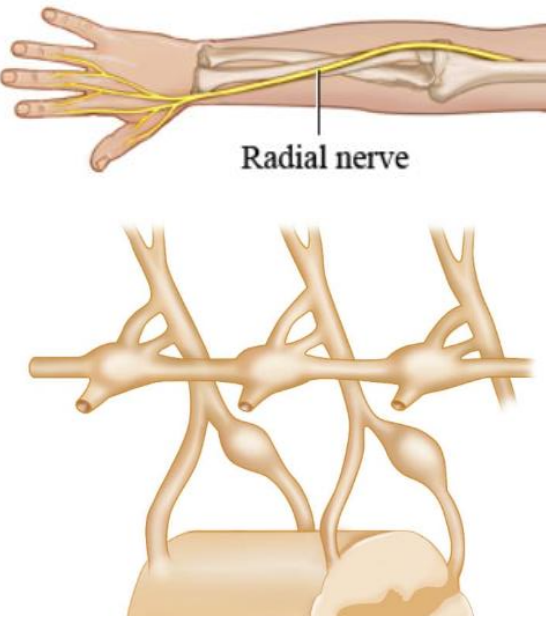
# Commissural Fibers



# Association Fibers



- Nerve: an aggregation of nerve fibers (axons) in the PNS
- Ganglion: an aggregation of nerve cell bodies (perikarya) in the PNS
- Tract (fasciculus): an aggregation of nerve fibers in the CNS, having the same origin & termination, & serving the same function.
- Funiculus (column): a large bundle of white matter which may consist of several functionally different tracts or fasciculi.



- Reticular formation: a region in the brain stem & upper spinal cord consisting of a group of interconnected neurons interspersed among nerve fibers.

