

# CRANIAL NERVE NUCLEI

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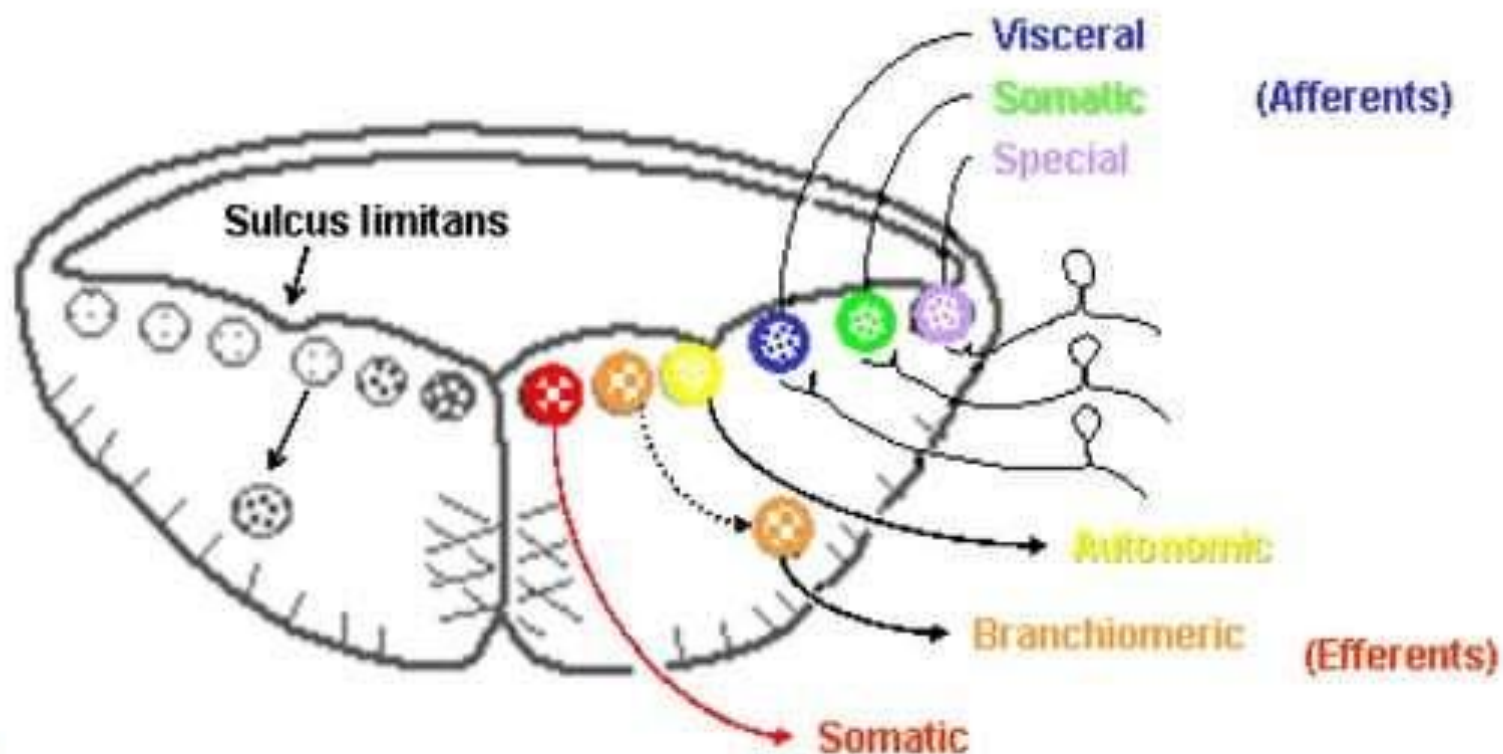
# Introduction

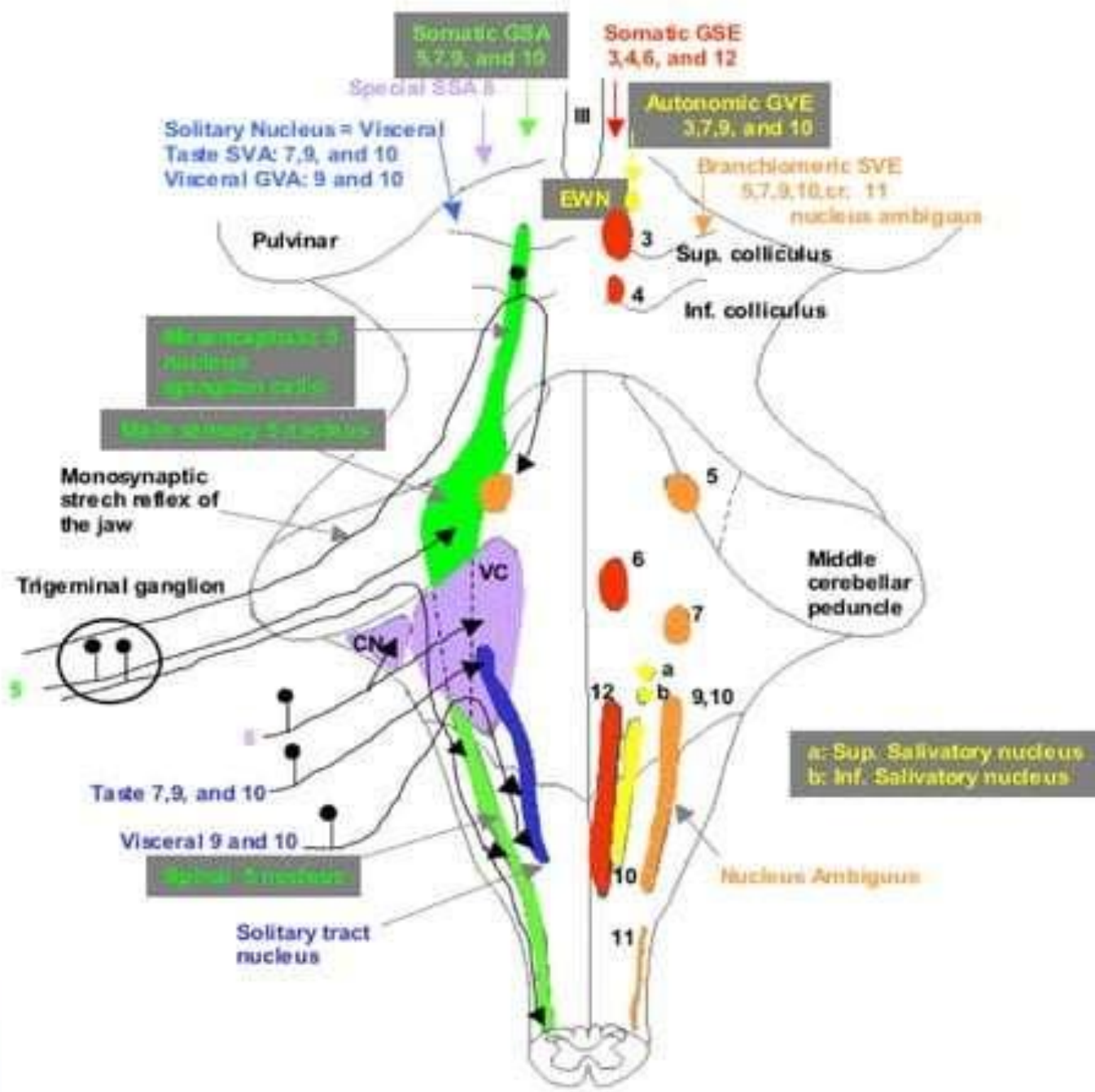
- ▶ There are 12 pairs of cranial nerves present in the brain.
- ▶ These nerves have motor and/or sensory nuclei in the brain stem from which they receive nerve fibres.
- ▶ Each of the 7 functional components of the various cranial nerves has its own nucleus of origin or termination.

# Cont.

- ▶ These nuclei are arranged from medio-laterally bearing the following in mind:
    - 1) All the efferents are medial to the afferents.
    - 2) The somatic fibres are more medial than the visceral fibres (in original circle of spinal cord)
    - 3) The special fibres are more medial than the general fibres (in original circle of spinal cord).
- During development, parts of the columns disappear and some nuclei migrate deeper into the brain stem.

- ▶ The medio-lateral arrangement is thus:  
SE, SVE, GVE, GVA, SVA, GSA, SSA





# Somatic efferent nuclei

- ▶ They consist of the following:
  - 1) Oculomotor nuclei forming a complex in the upper midbrain.
  - 2) Trochlear nucleus in the lower midbrain.
  - 3) Abducens nucleus in the lower pons.
  - 4) Hypoglossal nucleus in the medulla.

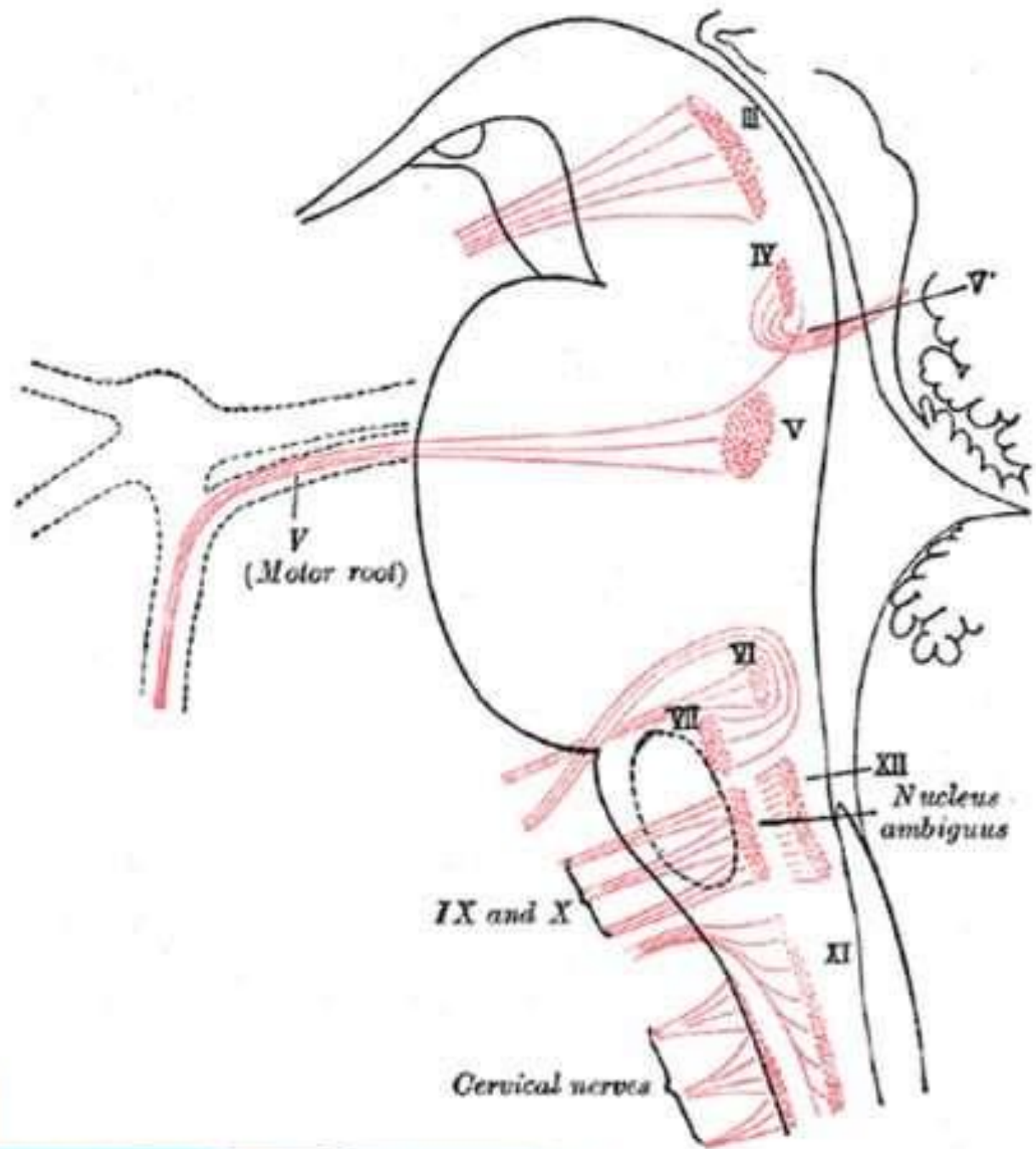
# Special Visceral nuclei

- ▶ These include:
  - 1) Motor nucleus of the trigeminal (upper pons)
  - 2) Facial nerve nucleus (lower pons)
  - 3) Nucleus ambiguus – giving fibres to CN IX & X. It is continuous with the spinal accessory nucleus which gives off the CN XI.

# General Visceral Efferent nuclei

- ▶ These consist of :
  - 1) Edinger-Westphal nucleus in the midbrain
  - 2) Superior and inferior and salivatory nuclei in the pons sending fibres to CN VII and CN IX respectively.
  - 3) Dorsal vagal nucleus in the medulla which sends GVE fibres to the vagus nerve.



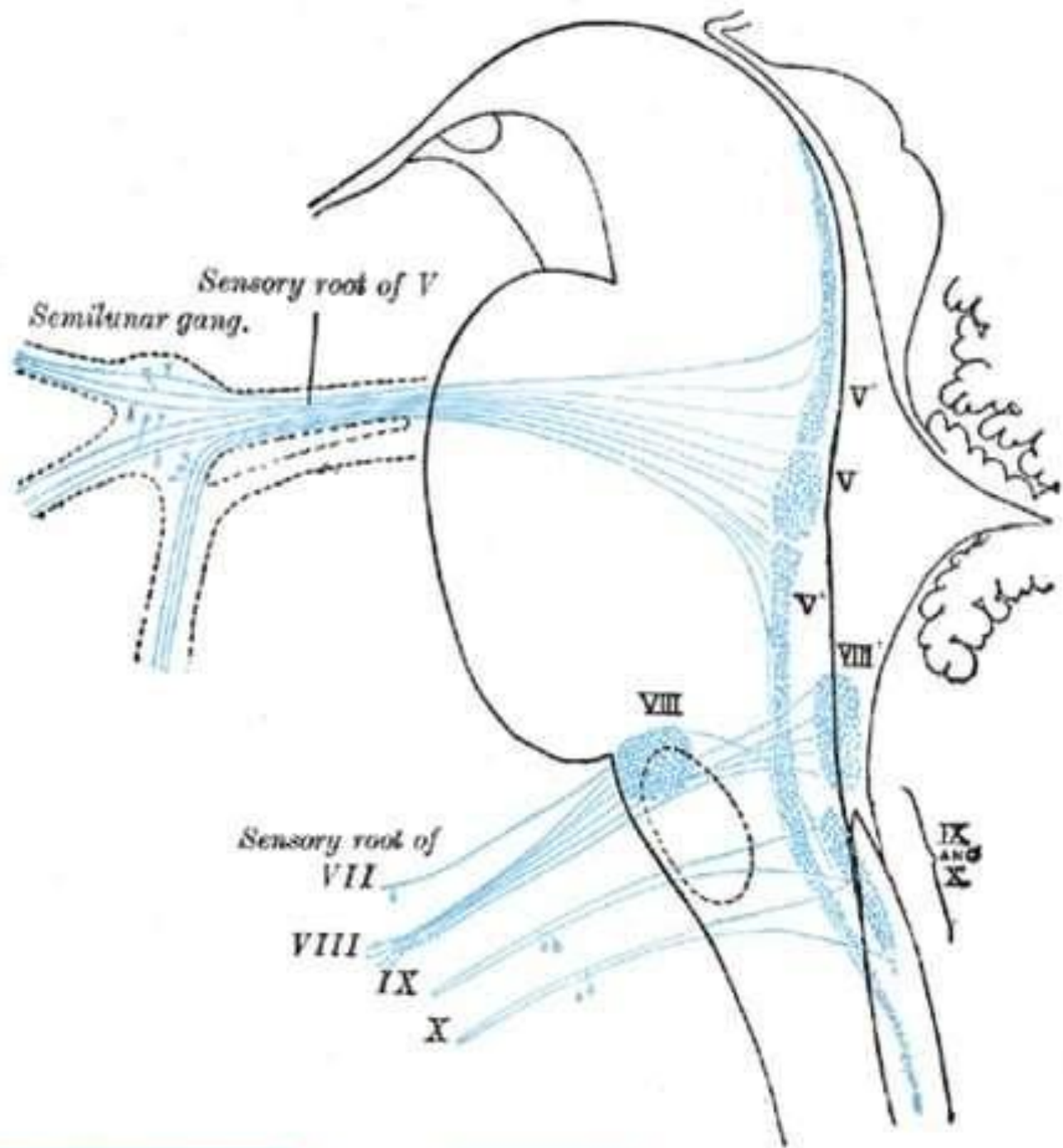


# General & Special Viscera Afferent

- ▶ These two columns are represented by the solitary nucleus in the medulla. Visceral inputs to the CN IX and X nuclei are through the solitary tract.
- ▶ The upper part of the nucleus is the destination of taste fibres from CN VII, IX and X.

# General Somatic Afferent Nuclei

- ▶ This is represented by the sensory nuclei of the trigeminal nerve:
  - 1) Main sensory nucleus in the upper pons.
  - 2) Spinal nucleus from the pons to medulla
  - 3) Mesencephalic nucleus extends from the pons to midbrain




# Special Somatic Afferent Nuclei

- ▶ These are the cochlear and vestibular nuclei which are at the junction between the pons and medulla. They both receive input from CN VIII.



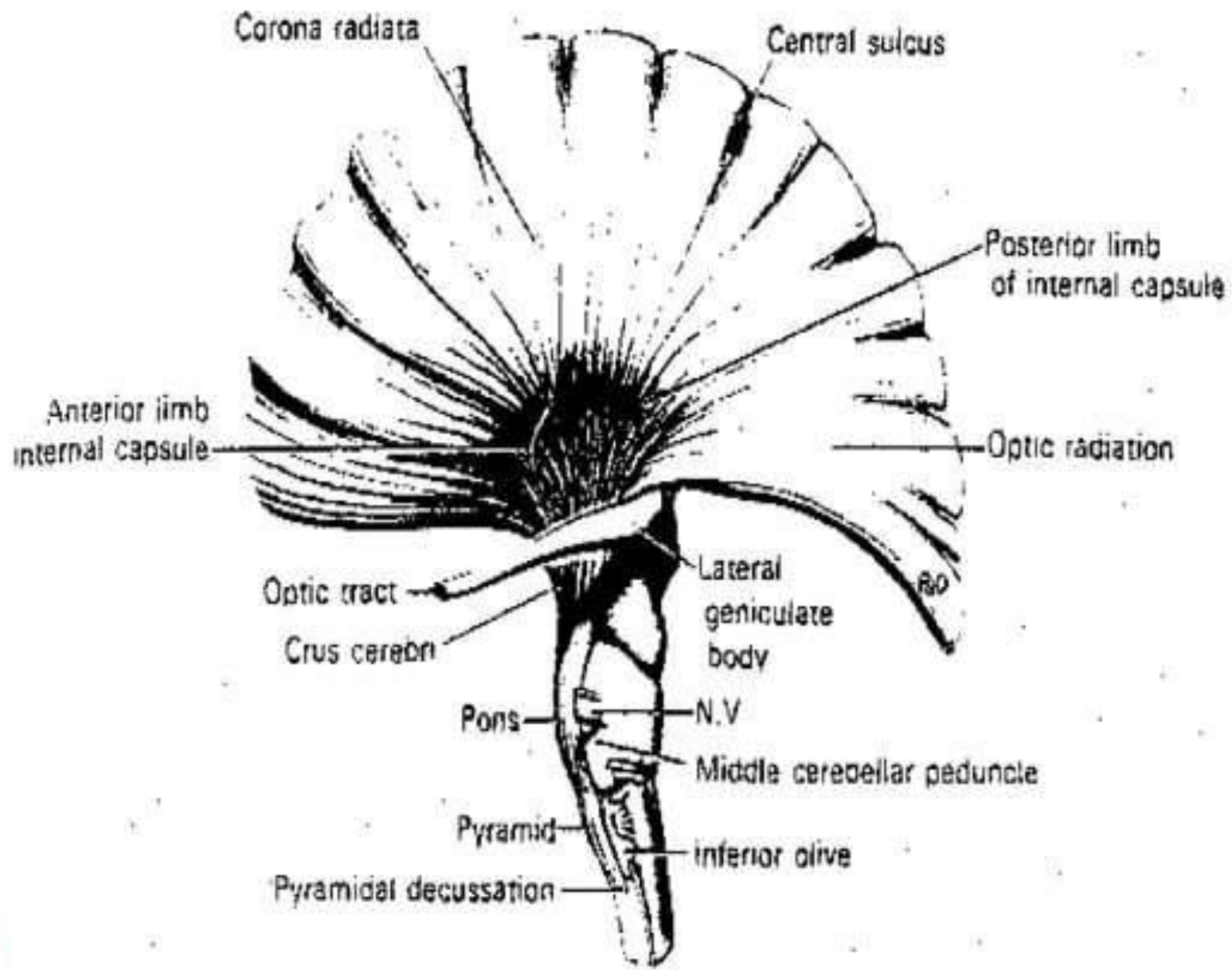
# Connections in the brain

- ▶ Parts of the brain are connected by nerve fibres which are named according to the kind of connections that are made.
  - ▶ **Association fibres:** Connect different regions in the cortex eg cingulum, superior & inferior longitudinal fasciculus.
  - ▶ **Projection fibres:** Connects the cortex and gray matter in the brain
  - ▶ **Commissural fibres:** Interconnect identical areas in the cerebral hemispheres.
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# Internal Capsule

- ▶ This is a major projection fibre in the brain interconnecting the cortex with the brainstem, thalamus and spinal cord.
- ▶ Is continuous with corona radiata above and crus cerebri below.
- ▶ Divided into 5 parts; anterior and posterior limbs, genu, retrolentiform and sublenticular parts.





# Corpus callosum

- ▶ This is the largest commissure in the brain interconnecting almost all parts of the cerebral cortex of the two hemispheres.
- ▶ Subdivided into: An anterior genu
  - Main trunk
  - posterior splenium

