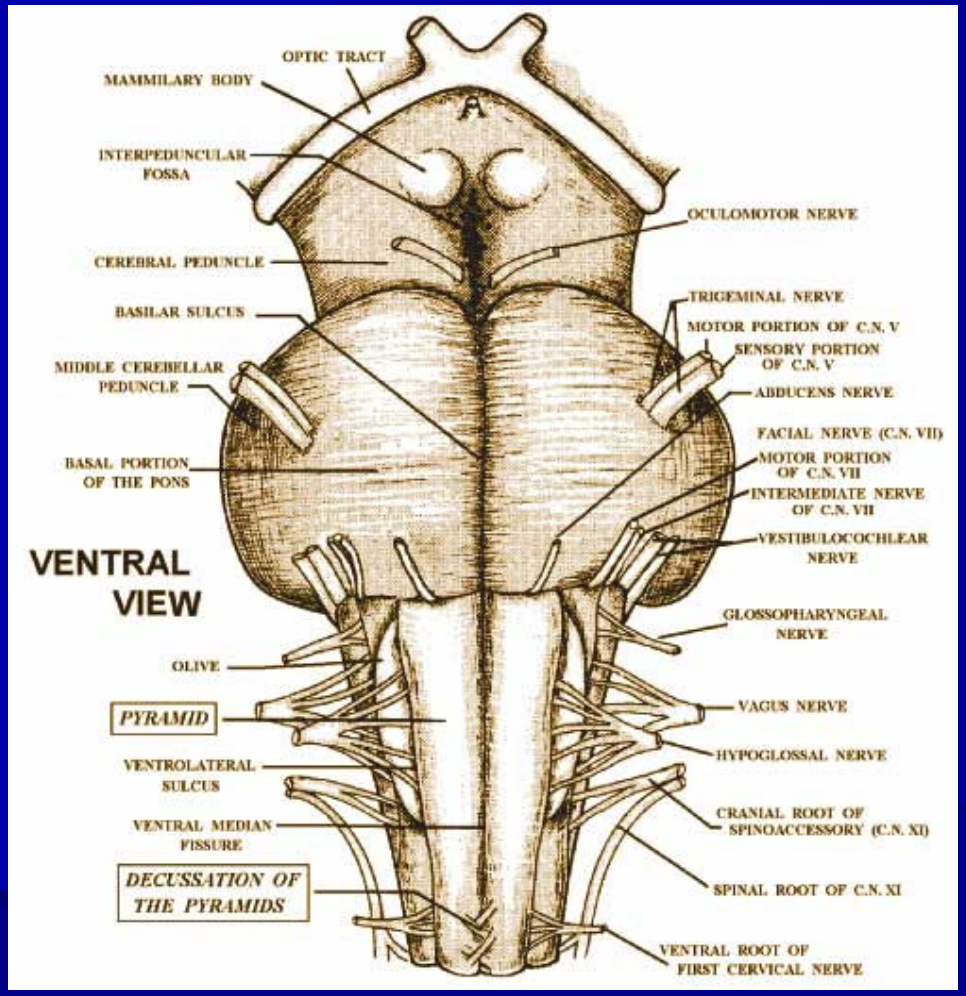
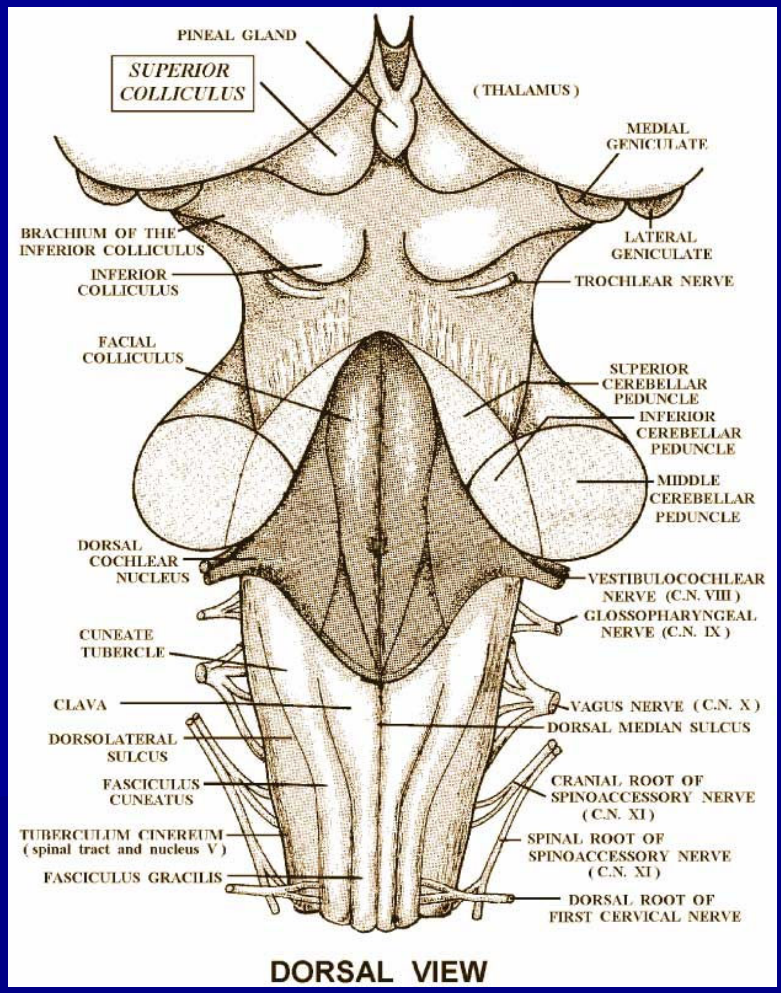
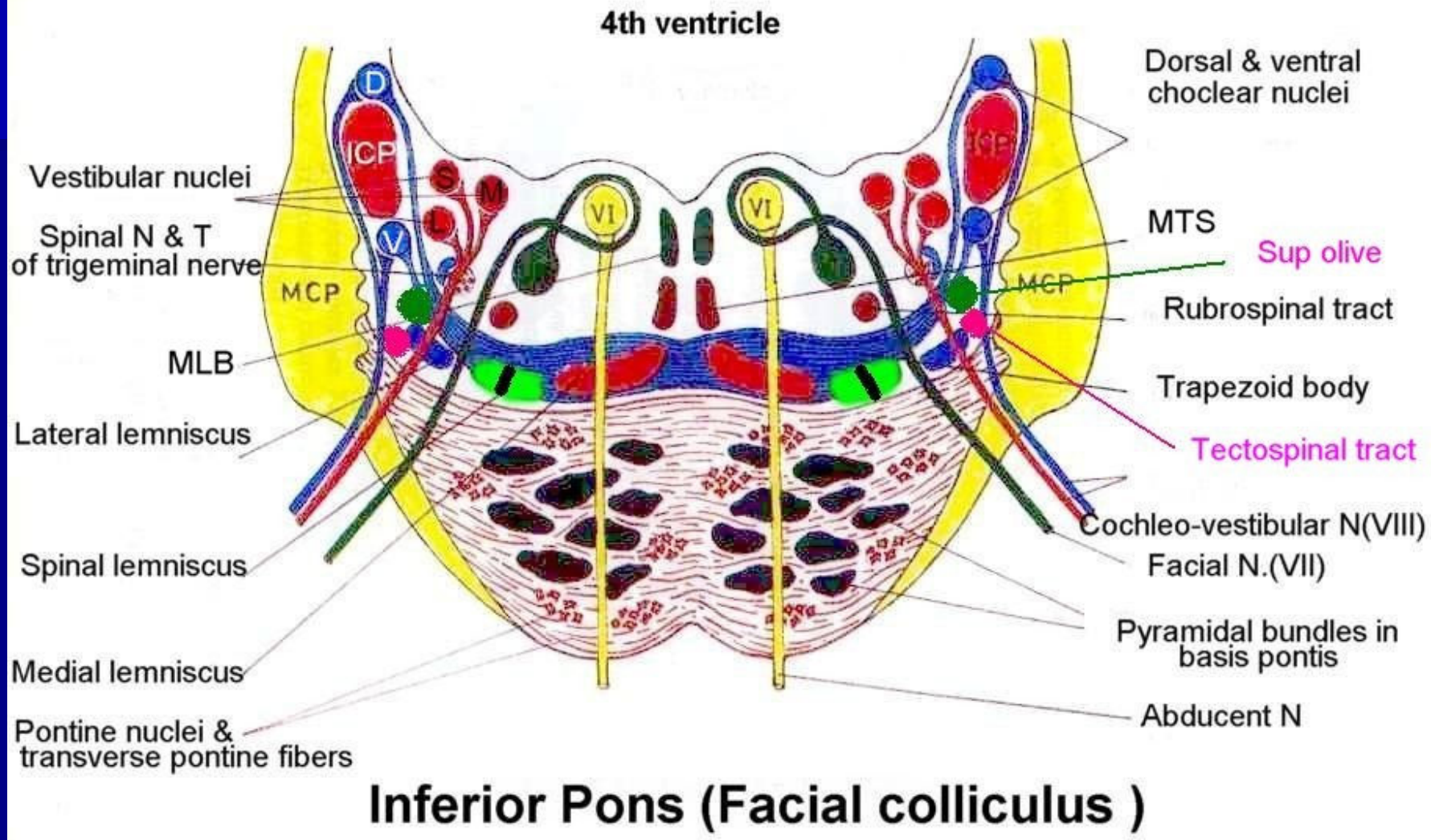
The Pons

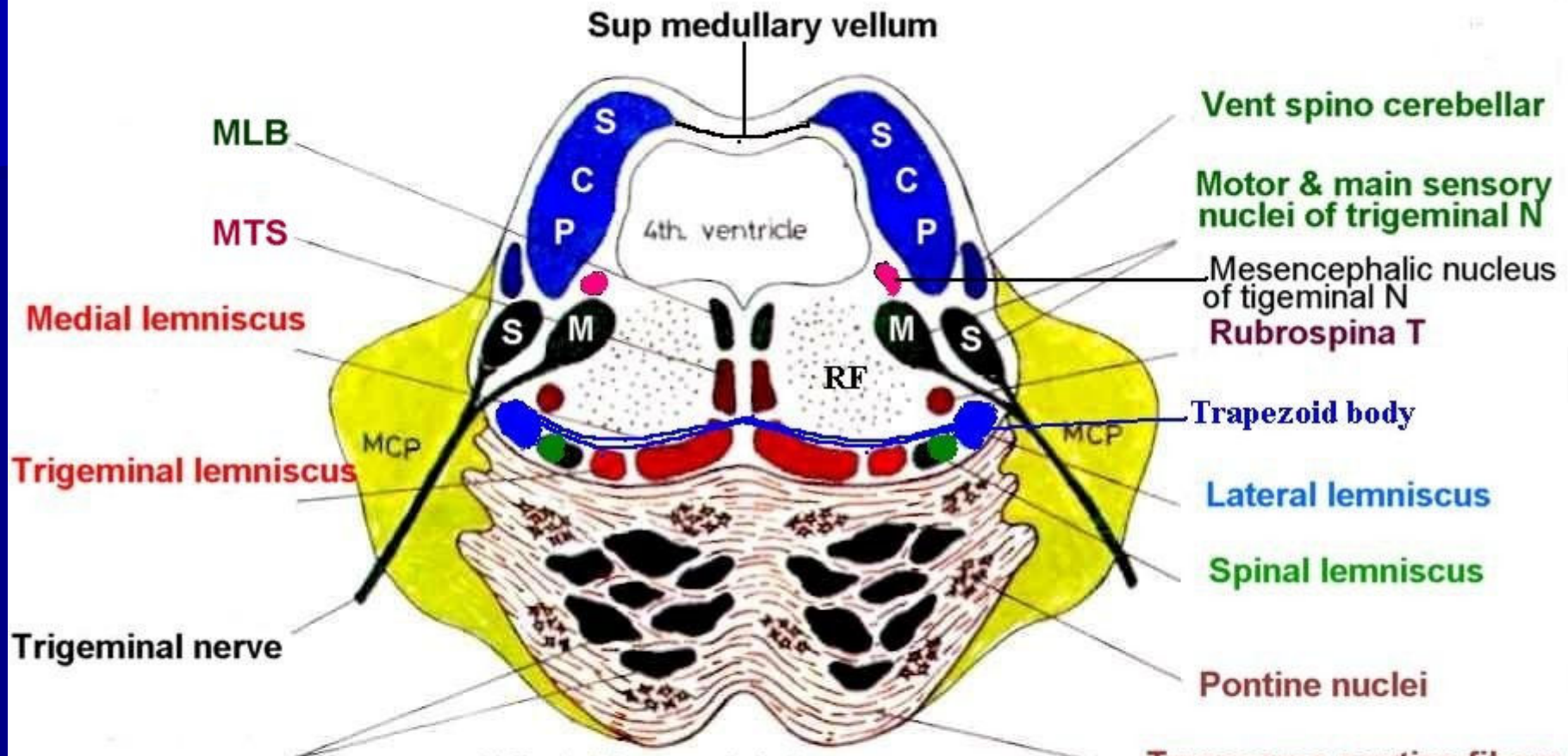

OPTIC TRACT
MAMMILARY BODY
INTERPEDUNCULAR FOSSA
CEREBRAL PEDUNCLE
BASILAR SULCUS
MIDDLE CEREBELLAR PEDUNCLE
BASAL PORTION OF THE PONS
VENTRAL VIEW
OLIVE
PYRAMID
VENTROLATERAL SULCUS
VENTRAL MEDIAN FISSURE
DECUSSATION OF THE PYRAMIDS
OCULOMOTOR NERVE
TRIGEMINAL NERVE
MOTOR PORTION OF C.N. V
SENSORY PORTION OF C.N. V
ABDUCENS NERVE
FACIAL NERVE (C.N. VII)
MOTOR PORTION OF C.N. VII
INTERMEDIATE NERVE OF C.N. VII
VESTIBULOCOCHLEAR NERVE
GLOSSOPHARYNGEAL NERVE
VAGUS NERVE
HYPOGLOSSAL NERVE
CRANIAL ROOT OF SPINOACCESSORY (C.N. XI)
SPINAL ROOT OF C.N. XI
VENTRAL ROOT OF FIRST CERVICAL NERVE


PINEAL GLAND
SUPERIOR COLLICULUS
(THALAMUS)
MEDIAL GENICULATE
LATERAL GENICULATE
BRACHIUM OF THE INFERIOR COLLICULUS
INFERIOR COLLICULUS
TROCHLEAR NERVE
FACIAL COLLICULUS
SUPERIOR CEREBELLAR PEDUNCLE
INFERIOR CEREBELLAR PEDUNCLE
MIDDLE CEREBELLAR PEDUNCLE
DORSAL COCHLEAR NUCLEUS
VESTIBULOCOCHLEAR NERVE (C.N. VIII)
GLOSSOPHARYNGEAL NERVE (C.N. IX)
CUNEATE TUBERCLE
CLAVA
VAGUS NERVE (C.N. X)
DORSAL MEDIAN SULCUS
DORSOLATERAL SULCUS
FASCICULUS CUNEATUS
CRANIAL ROOT OF SPINOACCESSORY NERVE (C.N. XI)
TUBERCULUM CINEREUM (spinal tract and nucleus V)
SPINAL ROOT OF SPINOACCESSORY NERVE (C.N. XI)
FASCICULUS GRACILIS
DORSAL ROOT OF FIRST CERVICAL NERVE
DORSAL VIEW



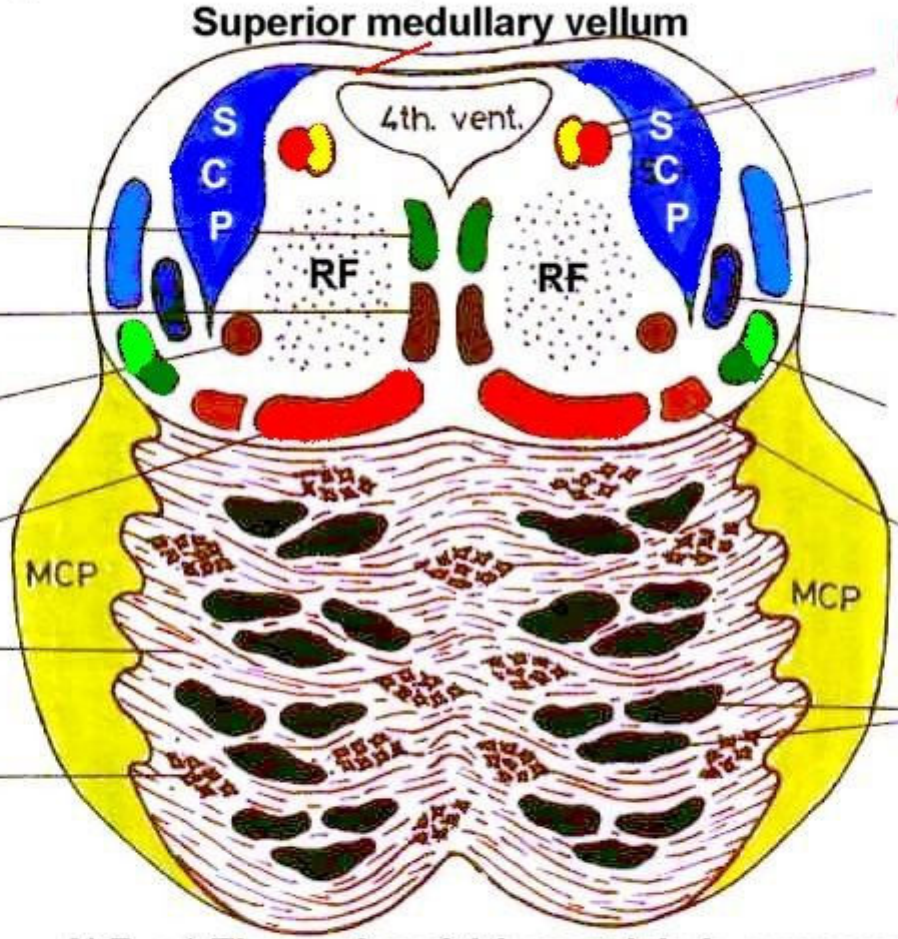
Inferior Pons (Facial colliculus)

Middle Pons (Trigeminal nuclei)



N.B: * 4th ventricle is narroww
*Its lateral boundaries are SCP
*Its dorsal bounary is the supperior medullary vellum
*Very well developed MCP

Superior Pons (Level of 4 lemnisci)



Mesencephalic N & T of trigrminal nerve

Lateral lemniscus

MLB

MTS

Ventral spino cerebellar

Robrospinal

Spinal lemniscus

Medial lemniscus

Trigeminal lemniscus

Transverse pontine fibers

Pyramidal tract bundles

Pontine nuclei

N.B. : * The cavity of 4th ventrivle is narrowed
* MCP is less developed than in the previous level
*The 4 lemnisci form a small arch
* The lateral lemniscus is well developed at this level

It consists of :

[1] Basis pontis

- Corticospinal , corticobulbar fibers
- Pontine nuclei
- Transverse pontine fibers (axons from the cerebellum via the middle cerebellar peduncle) (MCP)

[2] The tegmentum

- Upward continuation of the medulla
- Contains MLB –MTS- ML

  Contains crainial nerve nuclei of

  VIII –VII –VI –V

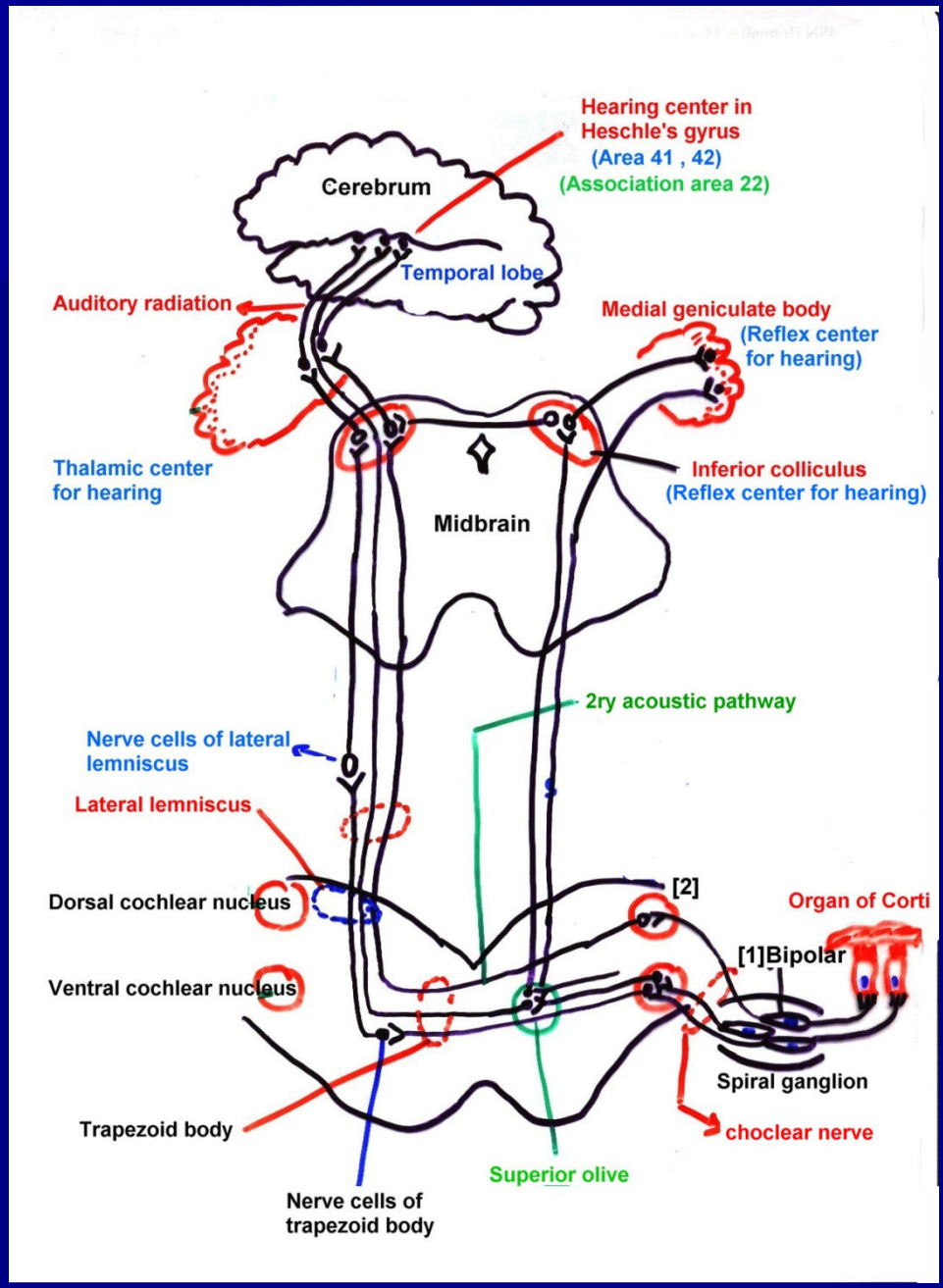
  Contains : ICP-RF|

The cochlear or auditory pathway

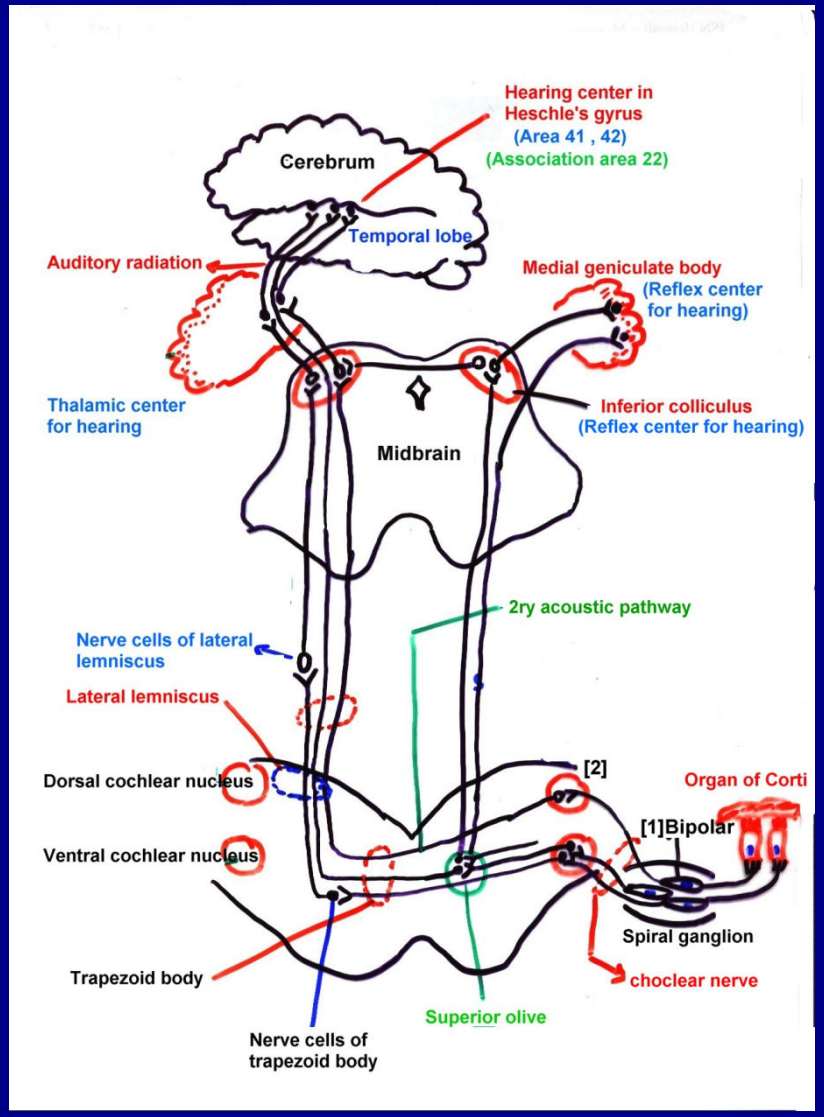
Lateral lemniscus & trapezoid body

1st order neurone:

- **Receptors** : inner & outer hair cells of organ of Corti in cochlea
- bipolar nerve cells of spiral ganglion
- Axons of bipolar nerve cells → cochlear nerve which enters the lower level of pons

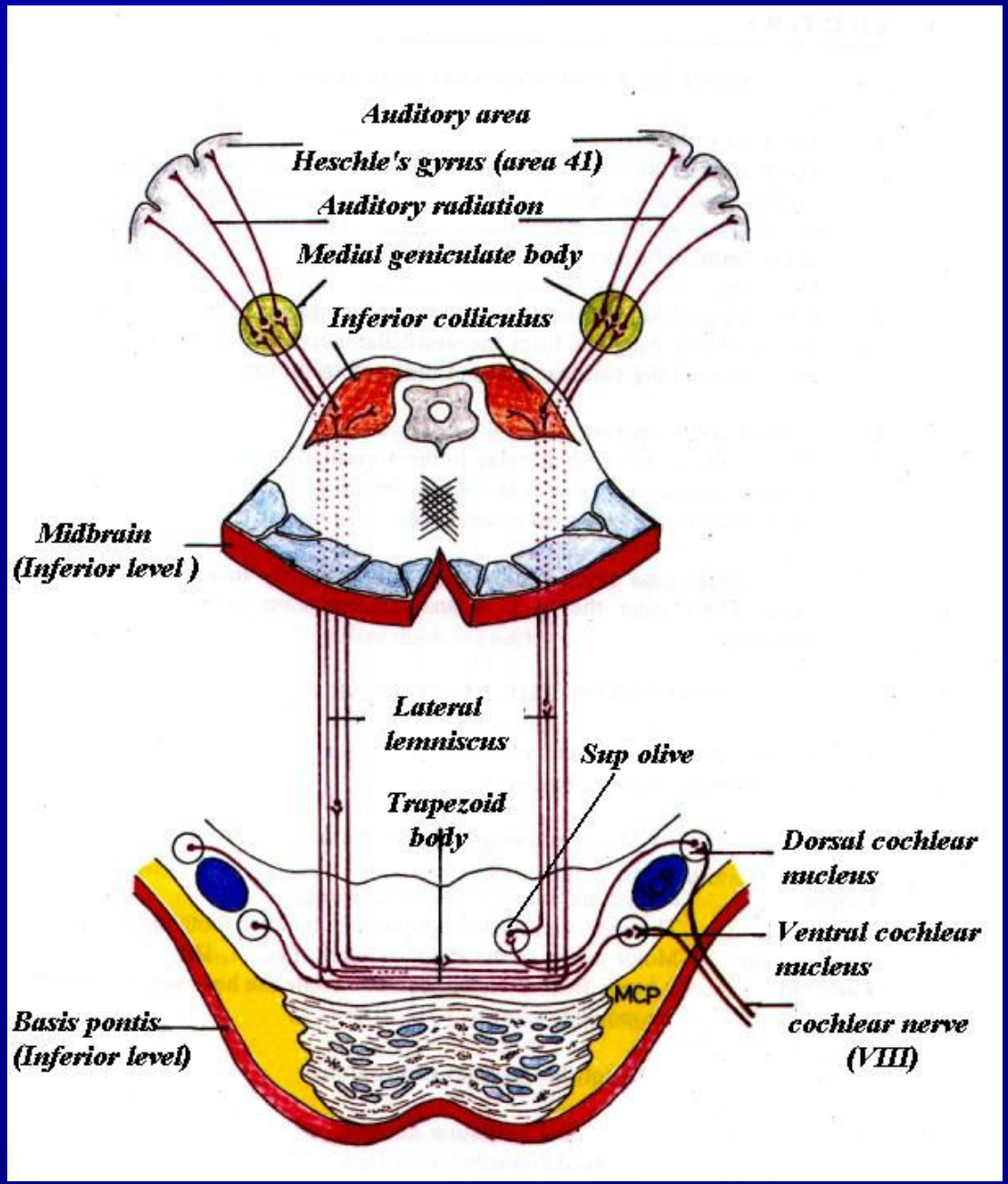


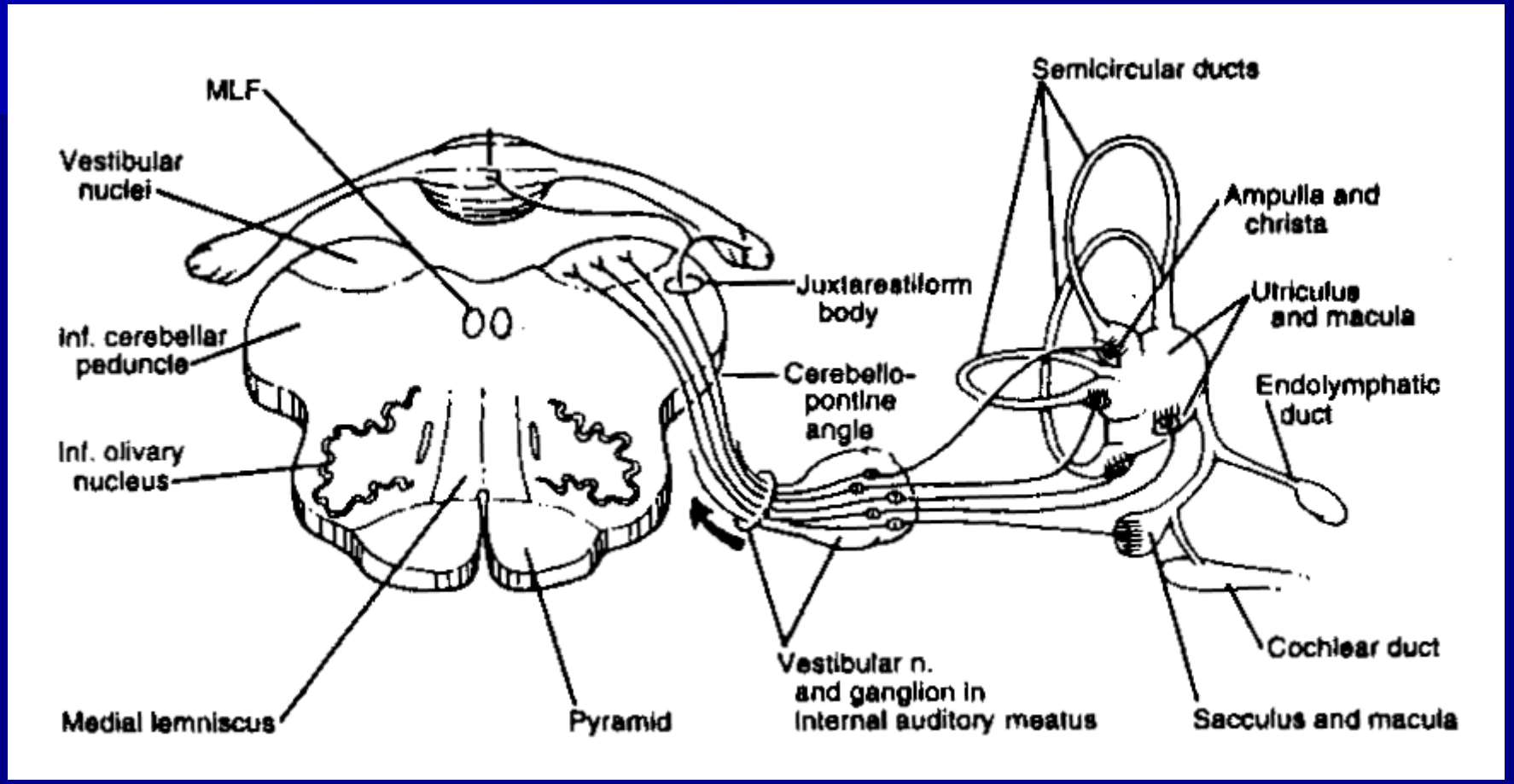
- **2nd order neurone:**
- **Dorsal & ventral cochlear nuclei**
- **Axons of these nuclei cross to the opposite side or ascend on the same side & relay in many stations before reaching the auditory area**

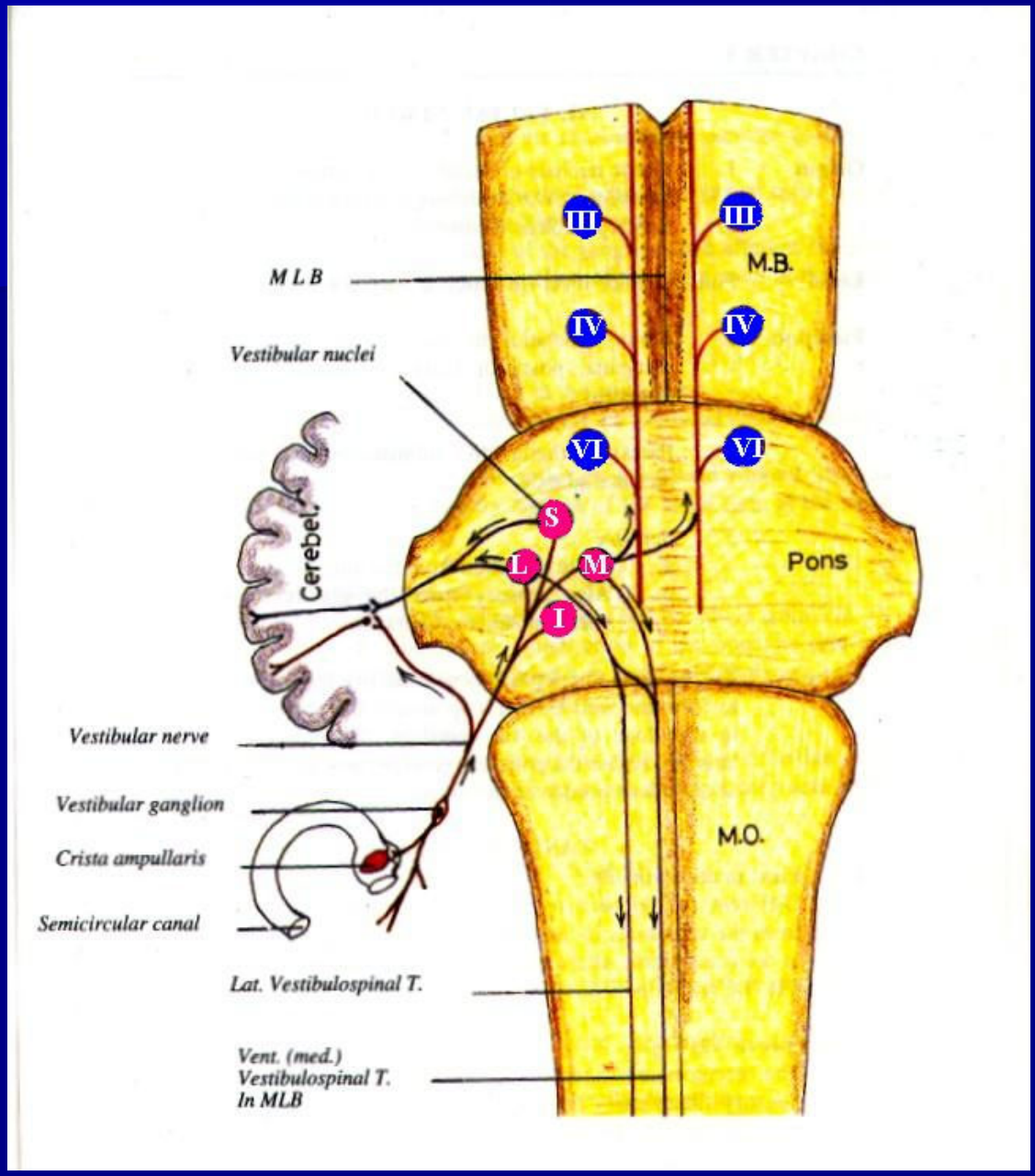


The next order neurons:

- Most of the axons of DCN & VCN cross to opposite side forming the **trapezoid body**
- The transverse fibers of the trapezoid body cross to opposite side forming the **lateral lemniscus**
- Some of the fibers synapse in cells of **superior olive** then ascend in lateral lemniscus of the same side
- Other fibers may synapse in the **trapezoid body nuclei or lateral lemniscus nuclei**
- Therefore each lateral lemniscus contain fibers carrying sensations from **both ears**
- Axons of DCN cross to opposite side **(2ry acoustic pathway)**
- Most of the fibers of lateral lemniscus relay in the **inferior colliculus** of the midbrain **(reflex center for hearing)**
- Fibers leave the inferior colliculus to relay in the **medial geniculate body (thalamic center for hearing)** . Some fibers reach this body without relaying in inferior colliculus
- Axons of MGB form auditory radiations which pass in the internal capsule to reach auditory area in **Heschle's gyrus (area 41) in temporal lobe bilaterally**


Auditory area
Heschle's gyrus (area 41)
Auditory radiation
Medial geniculate body
Inferior colliculus
Midbrain
(Inferior level)
Lateral
lemniscus
Sup olive
Trapezoid
body
Dorsal cochlear
nucleus
Ventral cochlear
nucleus
MCP
Basis pontis
(Inferior level)
cochlear nerve
(VIII)


MLF
Vestibular nuclei
Inf. cerebellar peduncle
Inf. olivary nucleus
Medial lemniscus
Pyramid
Juxtarestiform body
Cerebello-pontine angle
Vestibular n. and ganglion in internal auditory meatus
Semicircular ducts
Ampulla and crista
Utriculus and macula
Endolymphatic duct
Cochlear duct
Sacculus and macula


III
III
M.B.
M L B
IV
IV
Vestibular nuclei
VI
VI
Cerebel.
S
L
M
Pons
I
Vestibular nerve
Vestibular ganglion
M.O.
Crista ampullaris
Semicircular canal
Lat. Vestibulospinal T.
Vent. (med.)
Vestibulospinal T.
In MLB

Connections of vestibular nuclei

1- Vestibulo spinal
2- Vestibulo ocular
3- Vestibulo reticular
4- Vestibulo bulbar
5- Vestibulo cerebellar

[1] Vestibulo- spinal

Lateral	Ventral (Medial)
▪From lateral vestibular nucleus (Dieter's nucleus)	▪ From lateral , medial & inferior vestibular nuclei
▪ Descends without crossing to the AHCs	▪ Descends without crossing (through the MLB) to the AHCs

Function :

- ▪Strengthen the tone of extensor muscles of limbs
- ▪Supports the body against gravity & maintains an upright position

[2] Vestibulo-ocular

- **Origin** : Medial , inferior & lateral vestibular nuclei
- **Pathway** : via MLB
- **Termination** : III , IV , VI motor nuclei of eye movements
- **Function**: It keeps the field of vision the same while the head & body are moving

[3] Vestibulo – reticular

- **Origin**: From all vestibular nuclei
- **Pathway** : via MLB
- **Termination** : Ends in nerve cells of R.F.
- **Function** : It inhibits the vomiting center From RF
  Reticulospinal tracts ⟶ lateral & anterior horns of the SC

[4] Vestibulo-bulbar

Origin: From lateral vestibular nuclei
Pathway : via MLB
Termination : Ends in nucleus of accessory n.

Function : Strengthen the tone of extensor muscles of the neck

Supports the head against gravity

[5] Vestibulo-cerebellar

- **Origin**: Superior vestibular nucleus
- **Pathway** : Enters cerebellum through ICP
- **Termination** :

through SCP → thalamus

↘

Cerebral cortex