

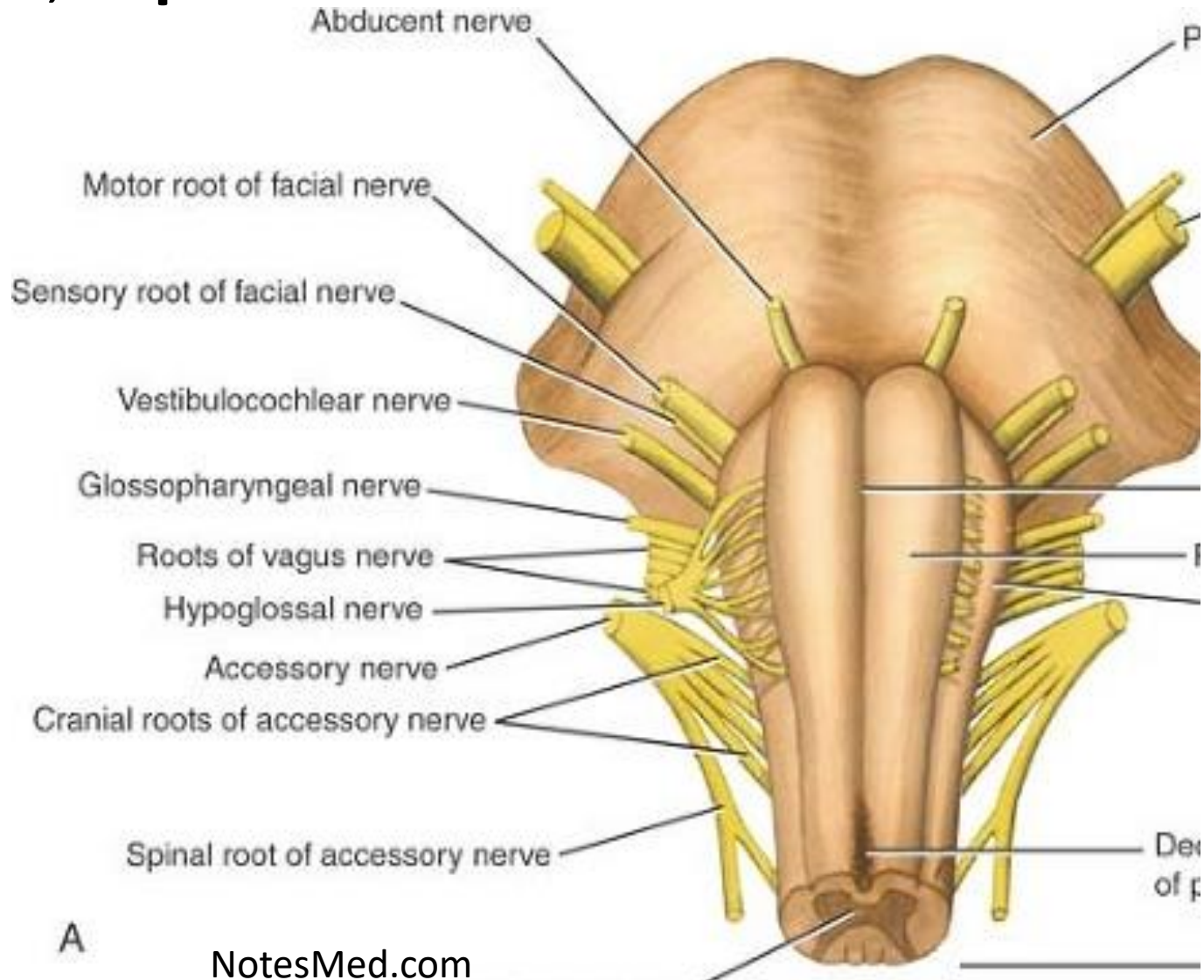
Pons

Pons

- The pons is a bulky broad transverse mass of the brainstem present between the midbrain and medulla.
- On either side, the pons is continuous as the middle cerebellar peduncle, thus forming a bridge between the two cerebellar hemispheres, hence its name pons (L. *pons* = *bridge*).

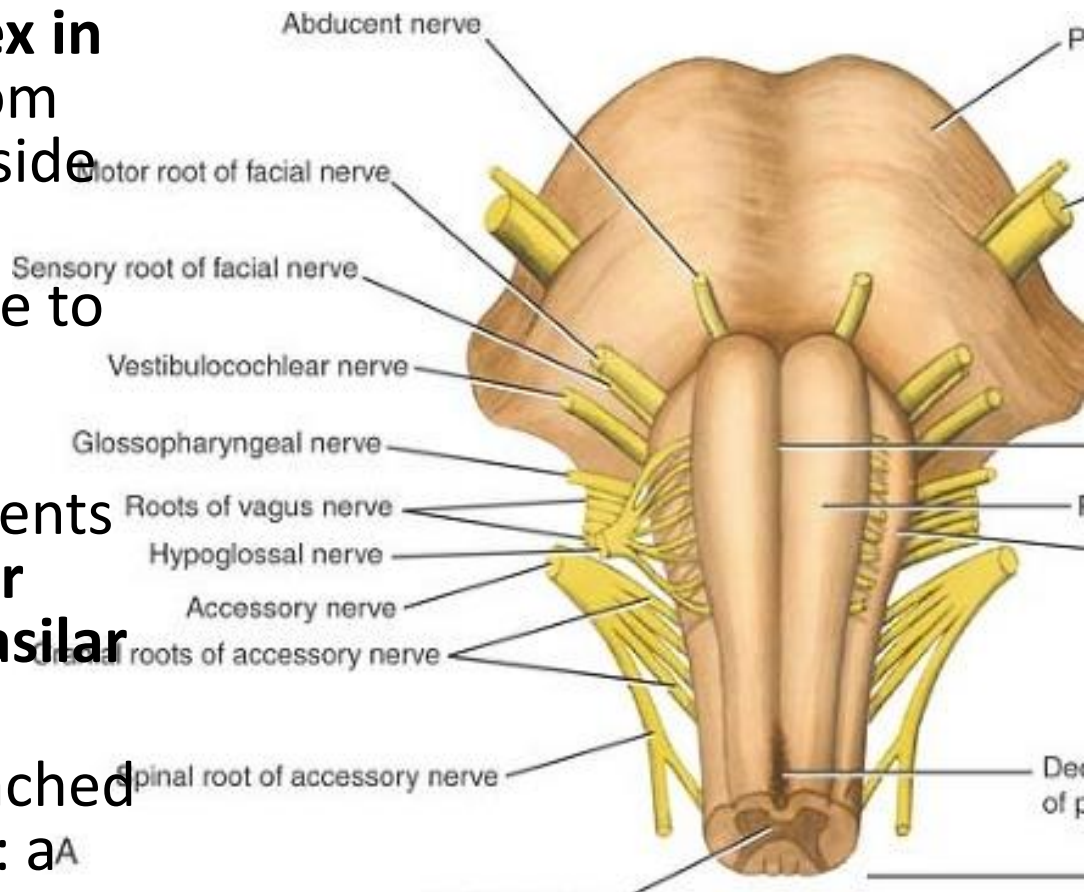
External features

- It has **ventral and a dorsal** surfaces two borders such as; **superior and inferior** borders.



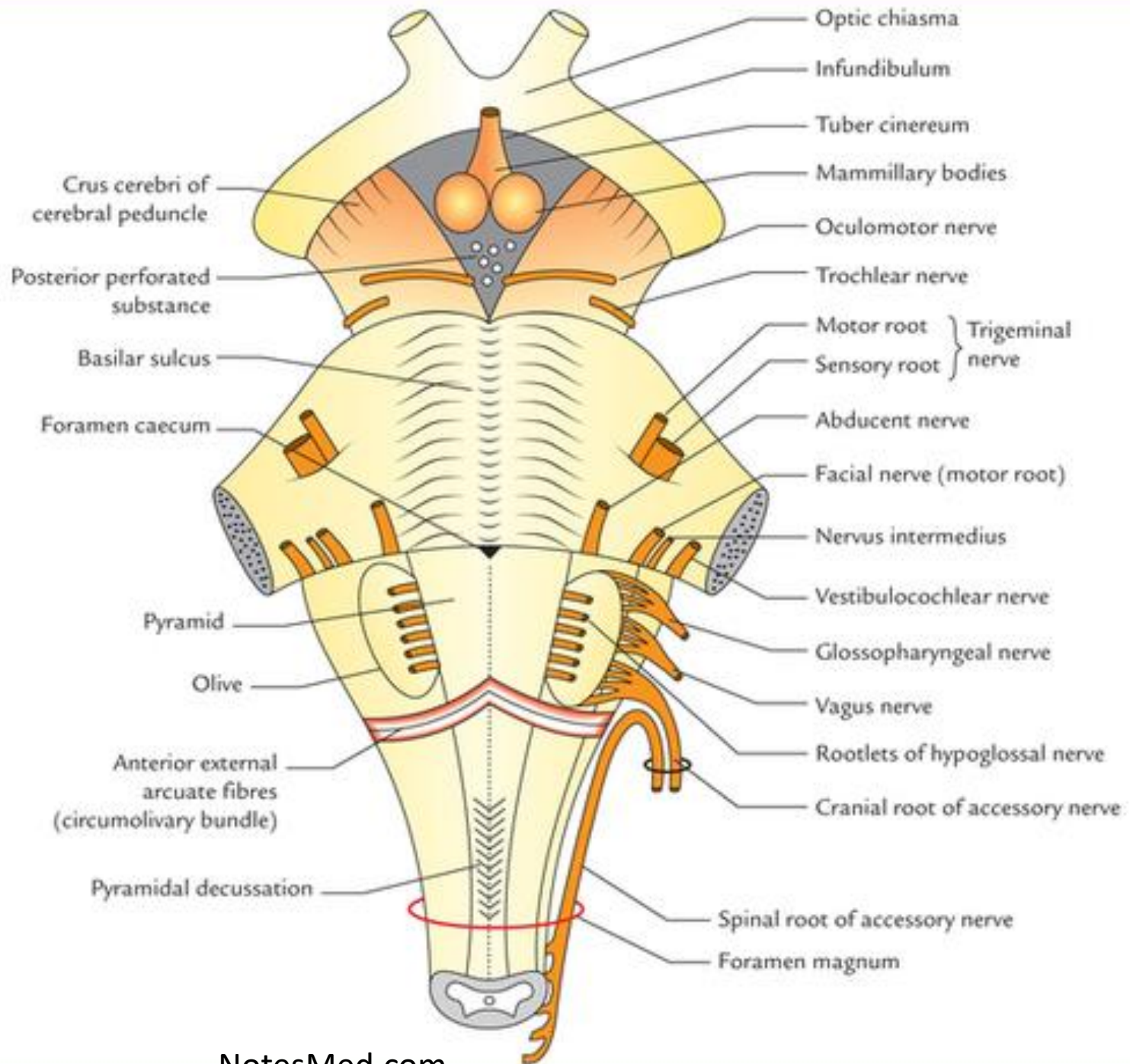
Ventral surface of pons

- The ventral surface is **convex in both the directions**, i.e., from before backward and from side to side.
- It is transversely striated due to underlying pontocerebellar fibres.
- In the median plane, it presents a vertical groove, the **basilar groove which lodges the basilar artery**.
- The **trigeminal nerve** is attached to this surface by two roots: a small motor and a large sensory root (the motor root lies medial to the sensory root).



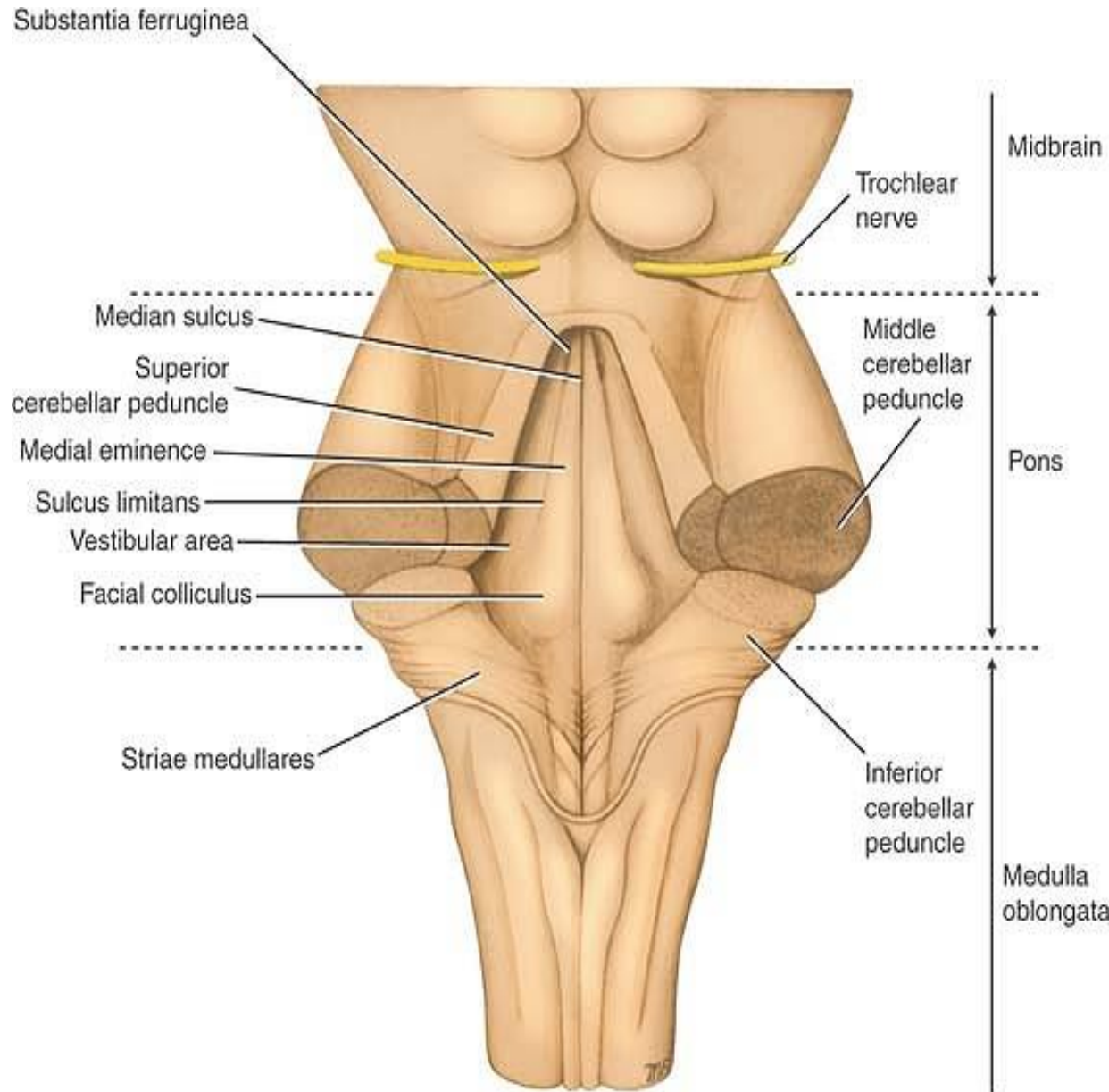
Ventral surface of pons

- Rostrally, the junction between the midbrain and pons is marked by **cerebral peduncles and the intervening interpeduncular fossa**; caudally the **pontomedullary junction** is marked by a shallow groove.
- In this groove, from medial to lateral, the abducent (VI), facial (VII), and vestibulocochlear (VIII) nerves emerge.
- The superior cerebellar arteries curve along the superior border, intervening between the oculomotor and trochlear nerves.
- The anterior inferior cerebellar arteries curve round the inferior border.



Dorsal surface of pons

- Covered by **cerebellum**
- Separated from it by the cavity of fourth ventricle.
- Triangular in shape and forms the upper part of the floor of the 4th ventricle.



Ventral View of the Brain

Frontal lobe

Olfactory bulb
(synapse point of
cranial nerve I)

Optic chiasma

Optic nerve (II)

Optic tract

Mammillary body (part of
hypothalamus)

Midbrain

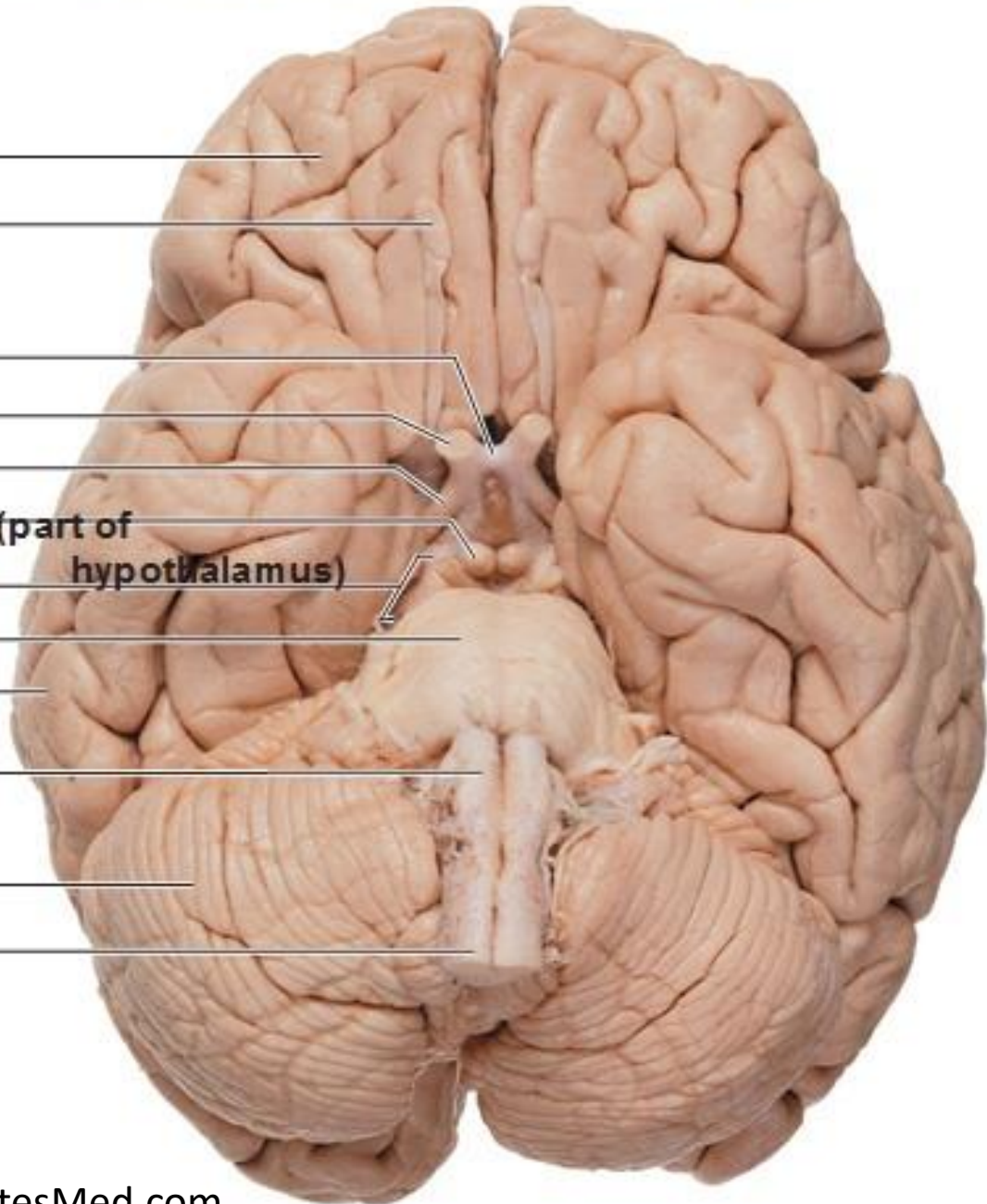
Pons

Temporal lobe

Medulla
oblongata

Cerebellum

Spinal cord

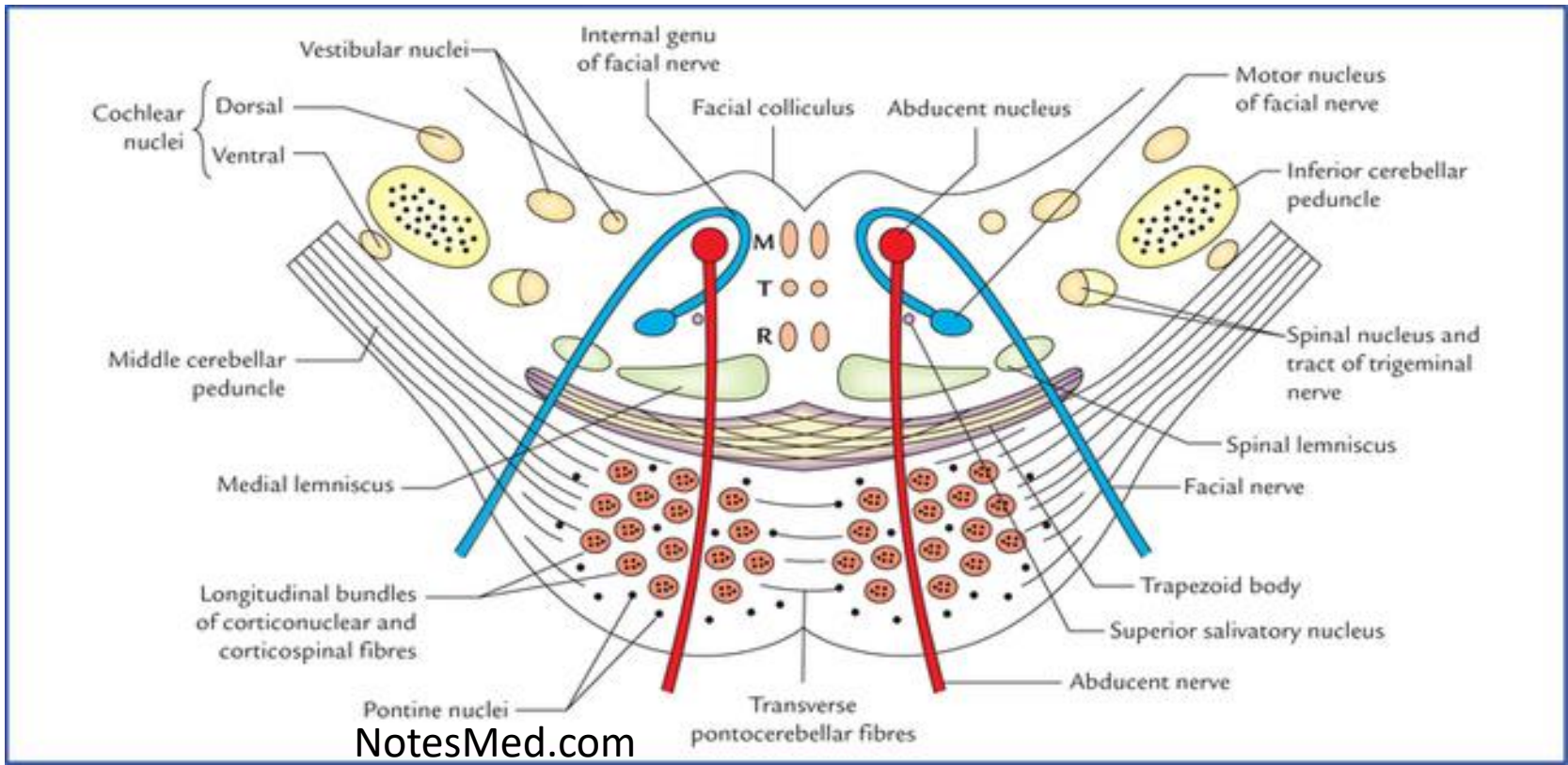


Structural components

Components	Functions
Grey matter	
• Pontine nuclei	Relay stations of corticopontine fibres and give origin to the pontocerebellar fibres
• Nuclei of V, VI, VII and VIII cranial nerves	Give or receive nerve fibres of these cranial nerves
• Pontine respiratory centre	Modifies the output of the respiratory centres in the medulla
White matter	
• Ascending and descending tracts	Subserves the motor and sensory functions
• Transverse pontocerebellar fibres	Form the distal segment of the recently evolved 'cortico-ponto-cerebellar pathway'

Internal features

- The **ventral** or **basilar part** is continuous inferiorly with the pyramids of the medulla and on each side with the middle cerebellar peduncle.
- The **dorsal** or **tegmental part** is a direct upward continuation of the medulla excluding the pyramids.



Basilar part

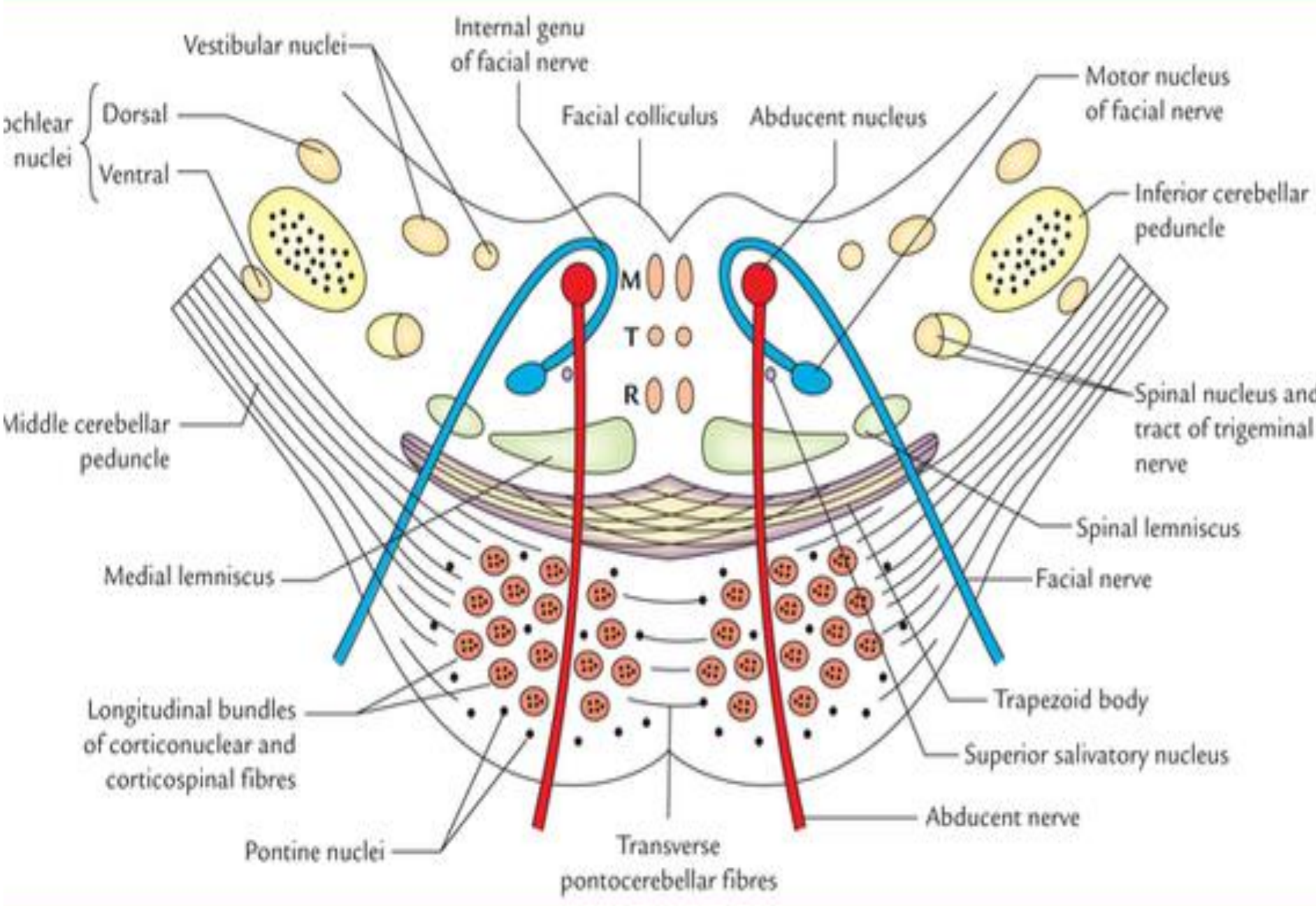
- Composed of the longitudinal bundles of fibres, the transverse fibres, and the pontine nuclei:
- **Longitudinal bundles of fibres include corticopontine, corticonuclear, and corticospinal fibres.**
 - a) The *corticopontine fibres relay in the ipsilateral pontine nuclei.*
 - b) The *corticonuclear fibres terminate in the contralateral (and to some extent ipsilateral) motor nuclei of the cranial nerves.*
 - c) The *corticospinal fibres converge toward the lower part of the pons and form the pyramids of the medulla.*

Basilar part

- **Transverse fibres** arise in the pontine nuclei and cross to the opposite side to form the middle cerebellar peduncle -*pontocerebellar fibres*.
- **Pontine nuclei** are scattered among the longitudinal and transverse fibres.

Tegmental part

- It is traversed by a number of ascending and descending tracts and contains a decussation of transversely running fibres, the **trapezoid body**.
- It also contains the nuclei of trigeminal (V), abducent (VI), facial (VII), and vestibulocochlear (VIII) nerves.
- Since the structure of tegmentum differs in the lower (caudal) and upper (cranial) parts of the pons, it is studied by examining transverse sections at these two levels.



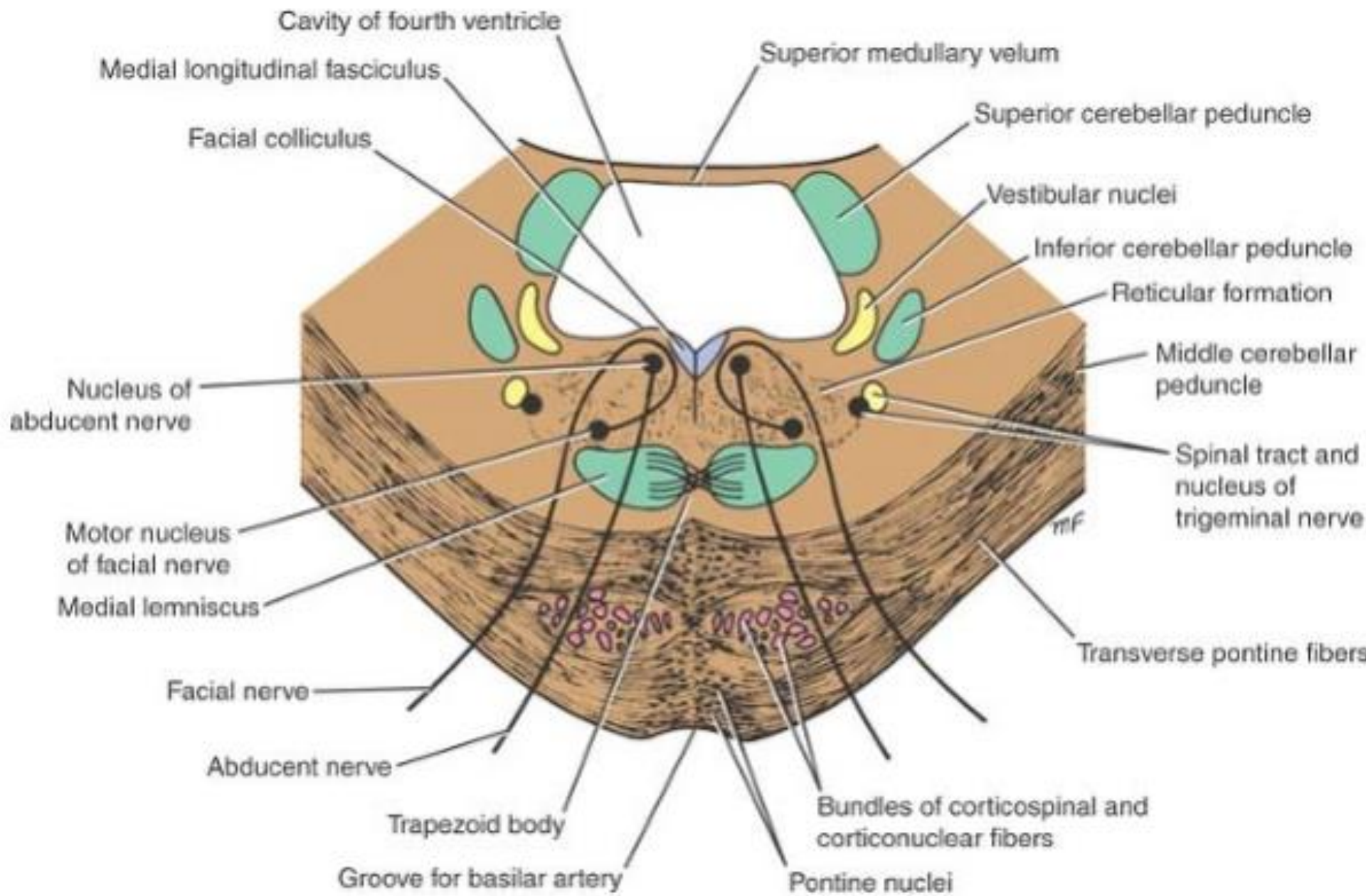


Figure 5-19 Transverse section through the caudal part of the pons at the level of the facial colliculus.

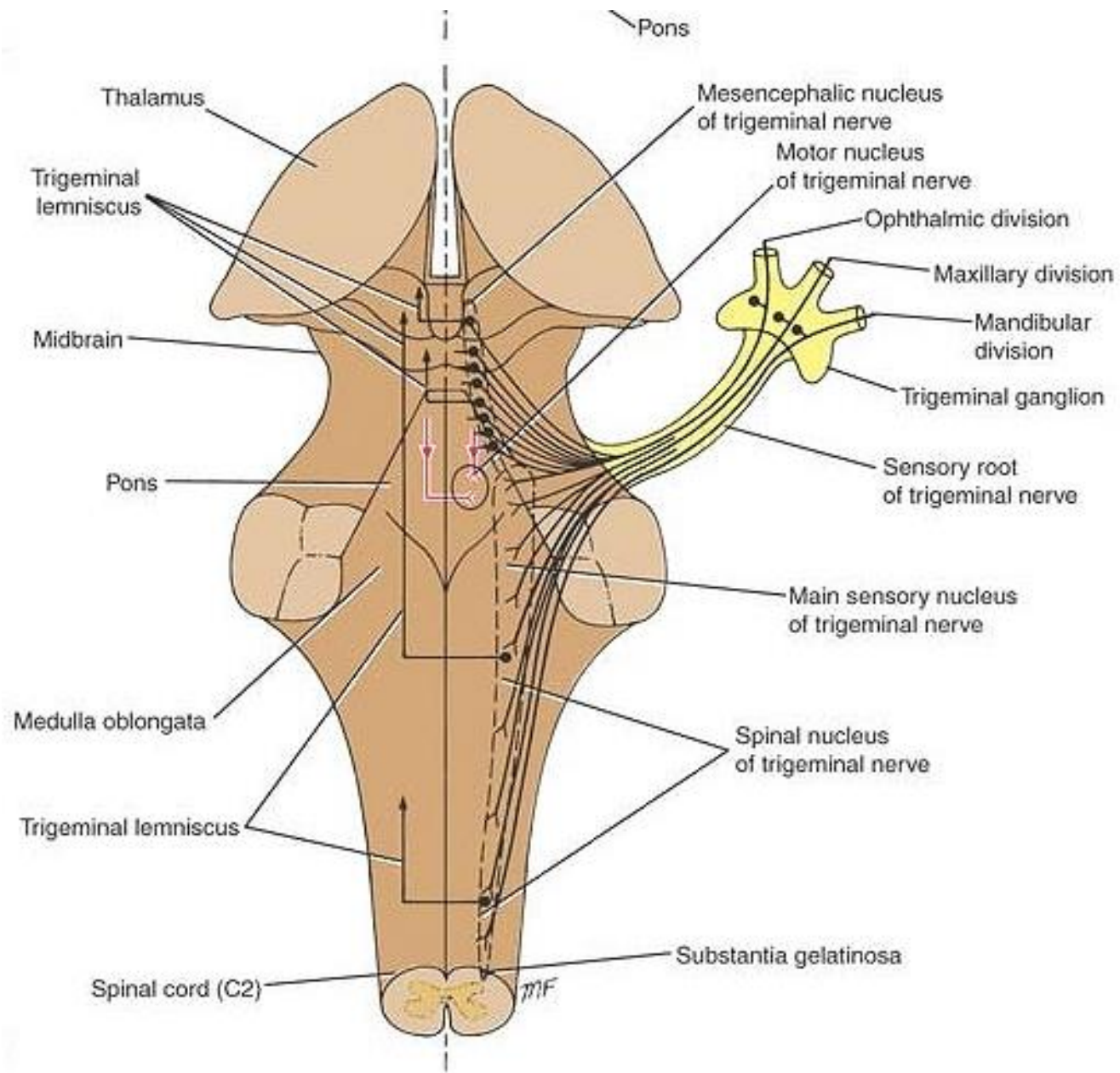
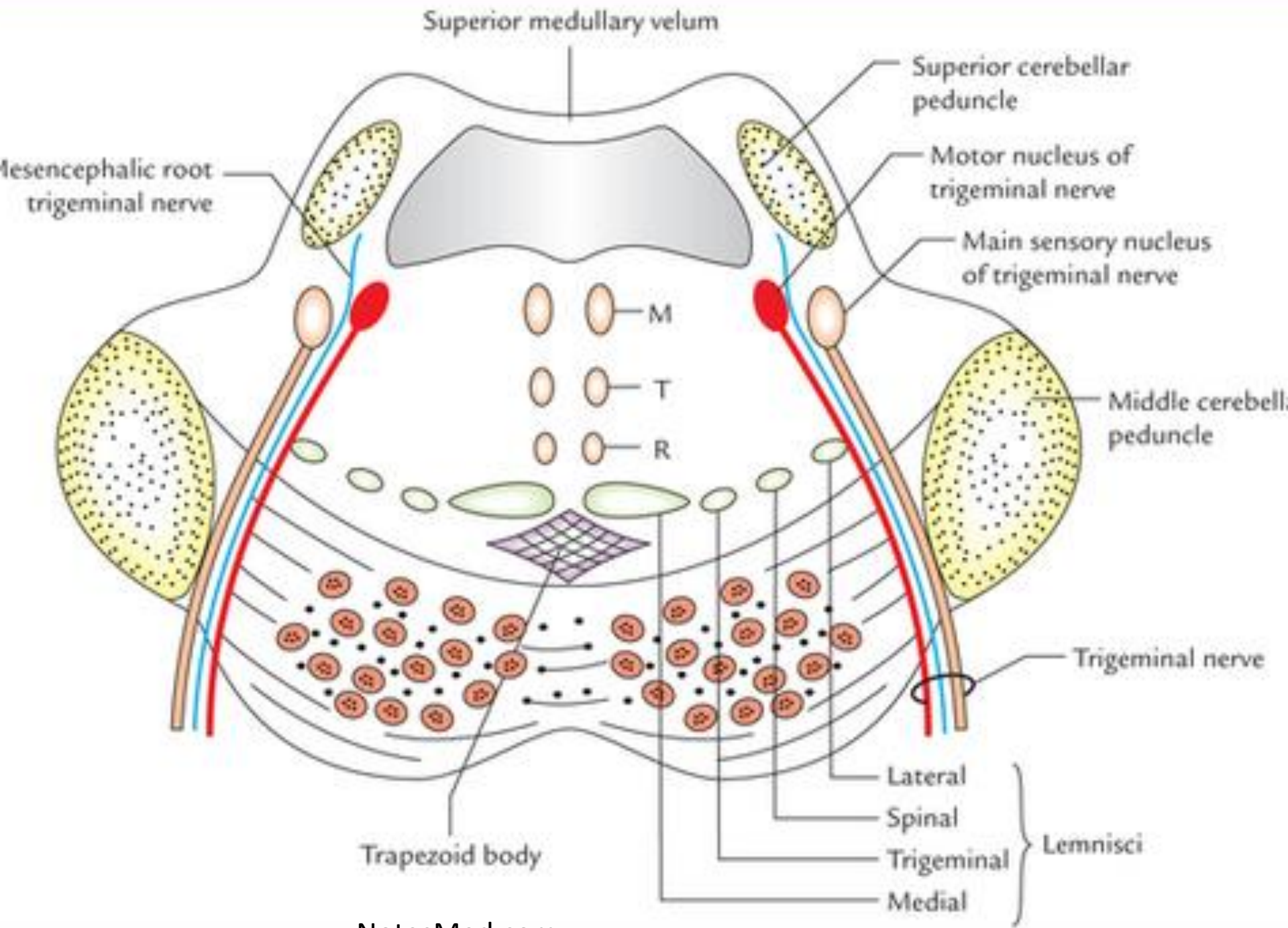


Figure 11-7 A: Trigeminal nerve nuclei seen in a coronal section of the pons. B: Trigeminal nei



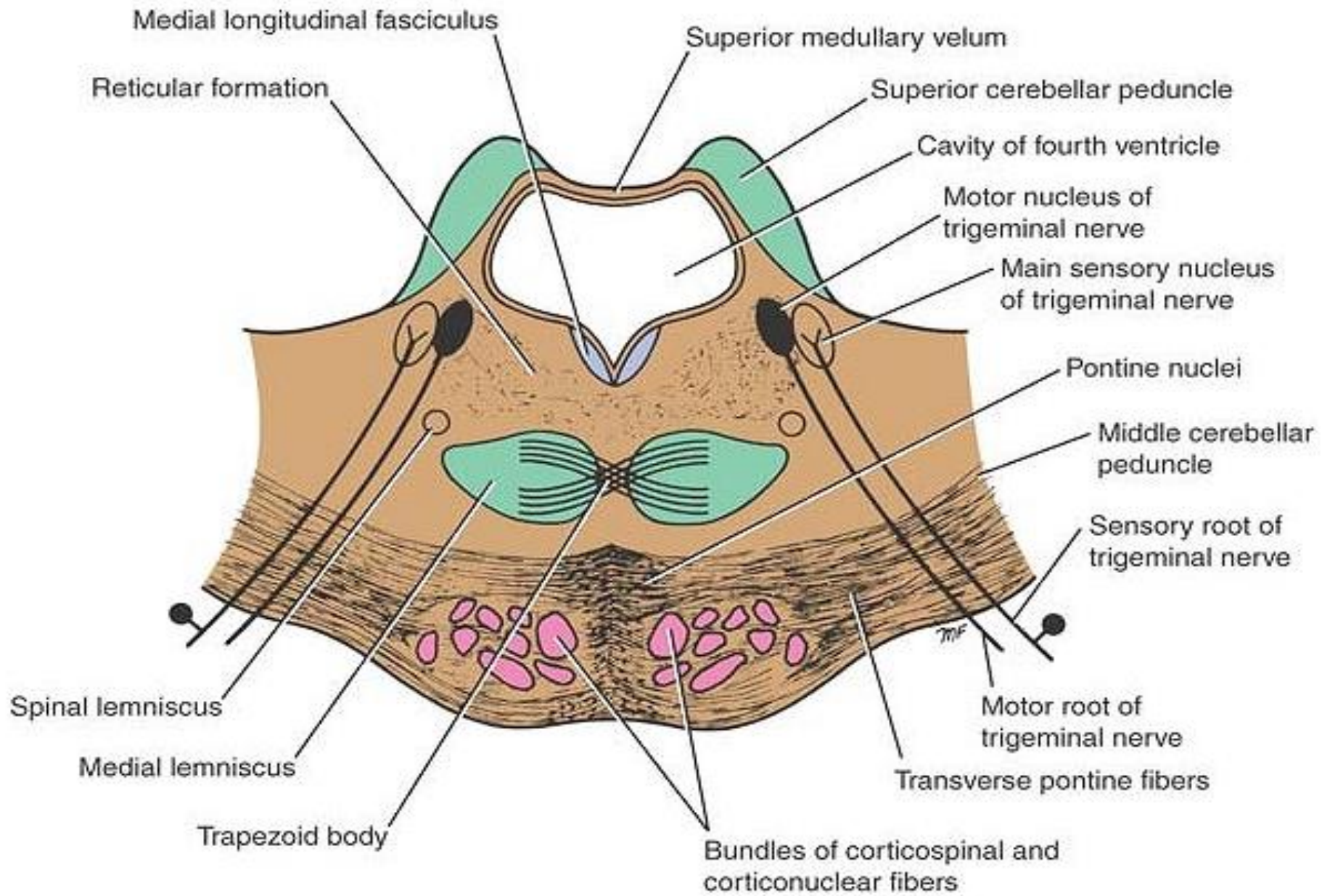


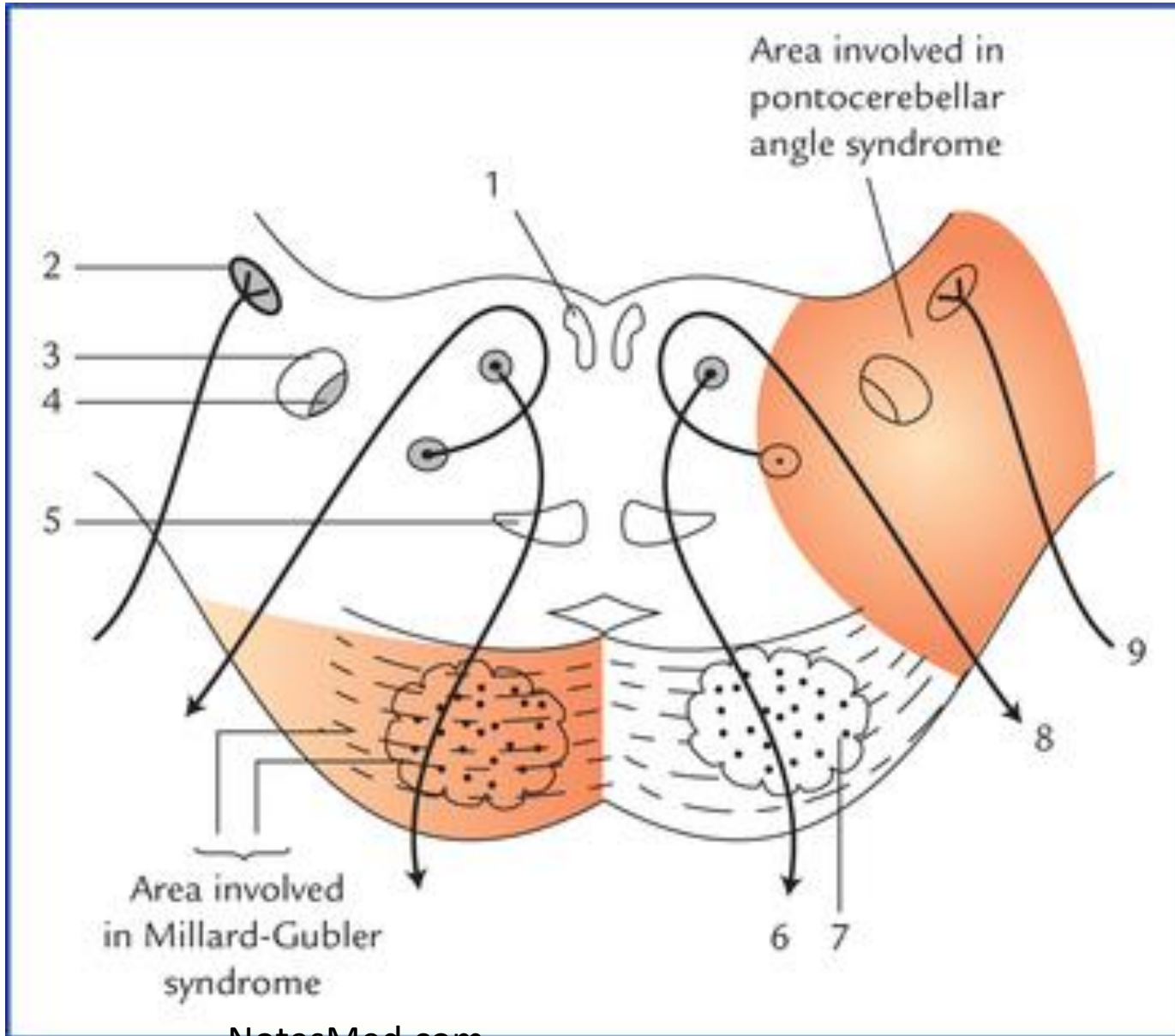
Figure 5-20 Transverse section through the pons at the level of the trigeminal nuclei.

	Lower part	Upper part
Grey matter	<p>Contain nuclei of VI, VII, VIII and nucleus of spinal tract of trigeminal nerve .</p> <p>Superior salivatory, inferior salivatory, and lacrimatory nuclei lying medial to the motor nucleus of the facial nerve.</p>	Contain motor and chief sensory nucleus of trigeminal nerve
White matter	Contain medial and spinal lemniscus and trapezoid body.	Contain 4 lemnisci medial ,trigeminal, spinal and lateral lemniscus and trapezoid body

Arterial supply

- Numerous (pontine) branches from the basilar artery.
- Anterior inferior cerebellar artery.

Applied Anatomy



Millard-Gubler syndrome (Medial inferior pontine syndrome)

- It results from a lesion in the lower part of the pons, which includes the pyramidal tract, the emerging fibres of the abducent and facial nerves.
 - ***Ipsilateral medial squint*** (*inward deviation of eye towards the side of lesion*) due to involvement of ***abducent nerve***.
 - ***Ipsilateral facial palsy***, due to involvement of facial nerve fibres.
 - ***Contralateral hemiplegia***, due to involvement of corticospinal tract.

Pontocerebellar angle syndrome

- *Tinnitus, progressive deafness, and vertigo* due to damage of **VIII cranial nerve**.
- *Ipsilateral ataxia and staggering gait* due to compression of **cerebellar peduncle**.
- *Ipsilateral lower motor neuron type of facial palsy*, due to involvement of **facial nerve**.
- *Ipsilateral loss of pain and temperature sensation and loss of corneal reflex* due to involvement of **spinal tract and nucleus of trigeminal nerve**.