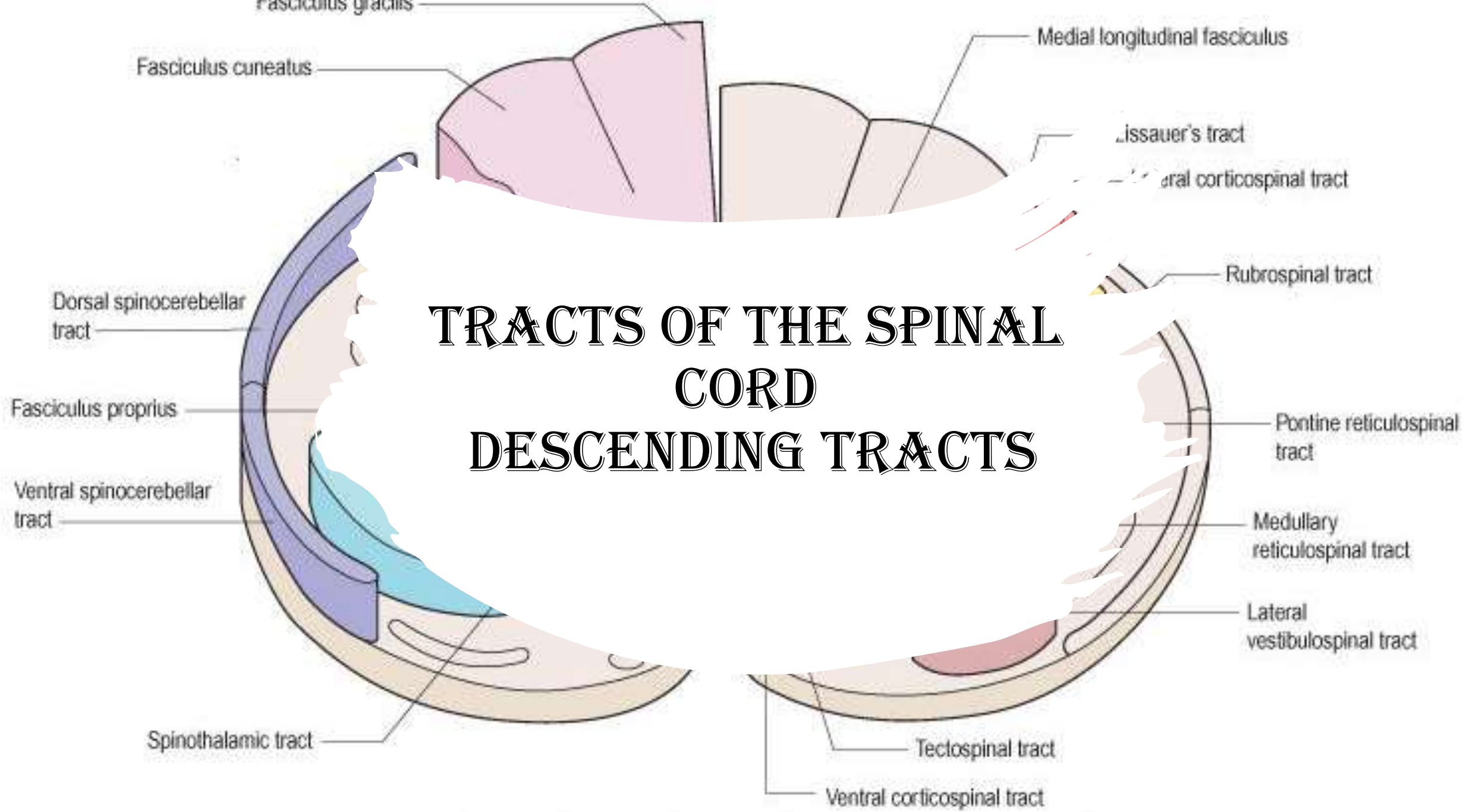
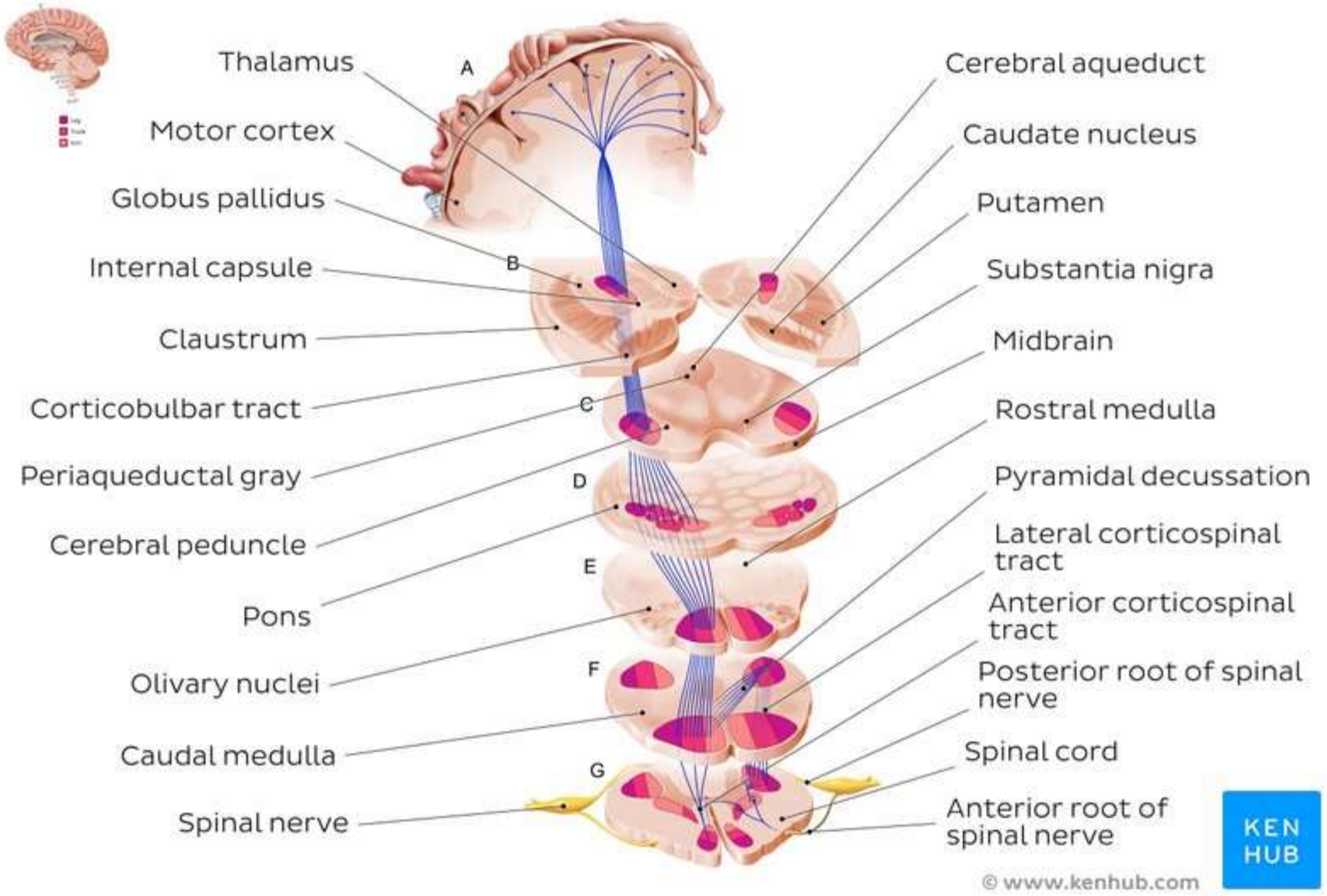
TRACTS OF THE SPINAL CORD
DESCENDING TRACTS

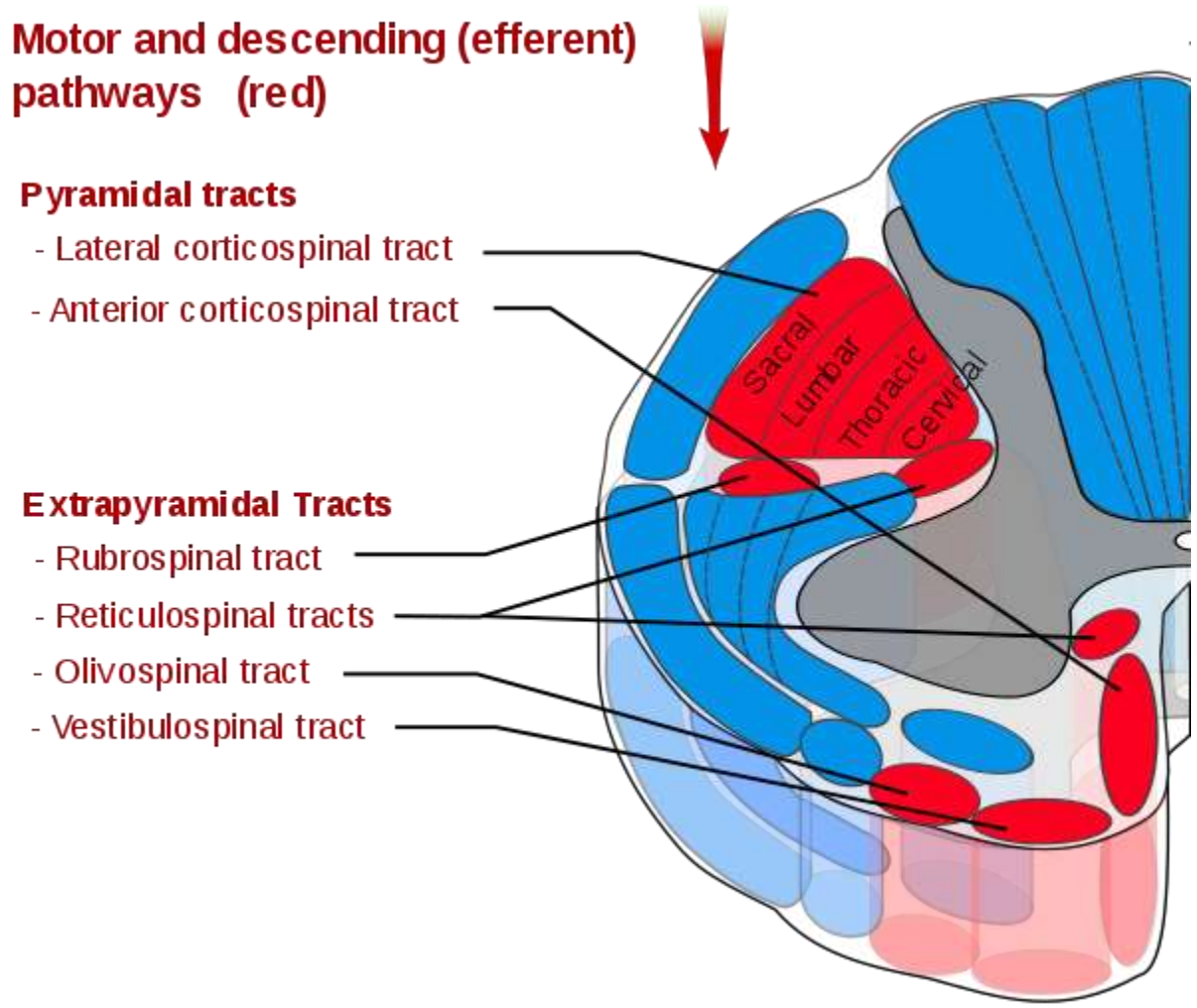


DESCEDING SPINAL TRACTS

- Are concerned with somatic and visceral motor activities.
- Have their cells of origin in the cerebral cortex or in the brainstem.



Descending (Motor) TRACTS



PyramidalTRACTS.

- **Corticospinal**
  1- Lateral corticospinal T.
  2- Ventral corticospinal T.
- **Corticobulbar T**

The motor systems outside of the pyramidal tract are often referred to collectively as the "extrapyramidal system".

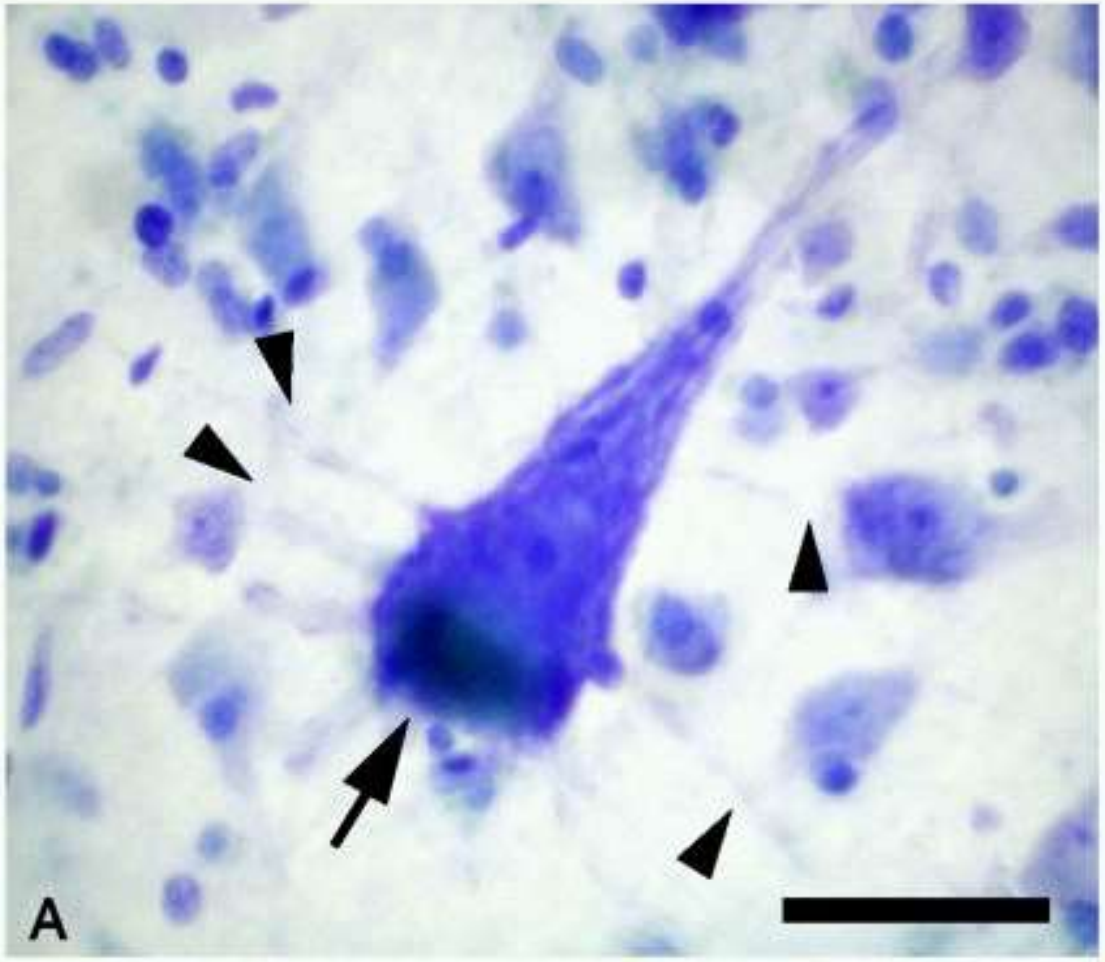
Extra-Pyramidal Ts.

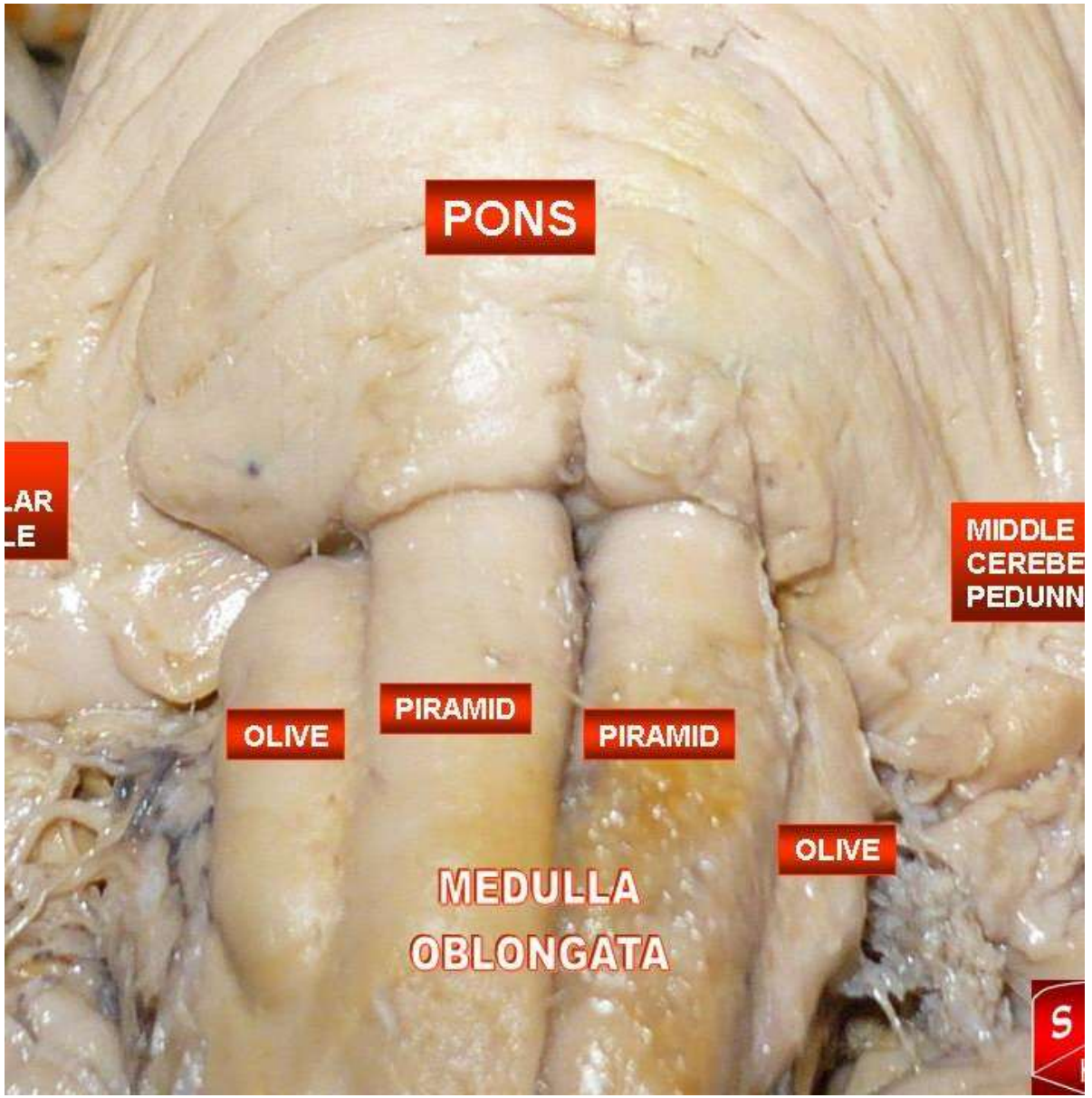
3- Rubrospinal T.

4- Lateral tecto, reticulo, vestibulo spinal Ts.

5- Ventral tecto,reticulo, vestibulo spinal Ts.

Pyramidal TRACTS





differences between pyramidal and extra pyramidal system.

PYRAMIDAL TRACTS	EXTRA PYRAMIDAL TRACTS
- Lateral corticospinal - ventral corticospinal - Corticobulbar ▪ located in precentral gyrus. ▪ descend directly from cerebral cortex to spinal cord. ▪ 80% cross in medulla 20% cross in spinal cord. ▪ Function: - Lateral : fine movement: Eg: needle work - Ventral: Postural movement	▪ -Rubrospinal -Vestibulospinal -Reticulospinal -Tectospinal ▪ originate in brainstem nuclei No direct control of motor cortex ▪ 3- all of them cross except Vestibulospinal ▪ Function: - Control of body posture - involuntary movements muscle

IMPORTANT TERMS

- UPPER MOTOR NEURONS

(UMNs)

- The upper motor neurons originate in the cerebral cortex and travel down to the brain stem or spinal cord, while the

- LOWER MOTOR NEURONS (LMNs)
- lower motor neurons begin in the spinal cord and go on to innervate muscles and glands throughout the body

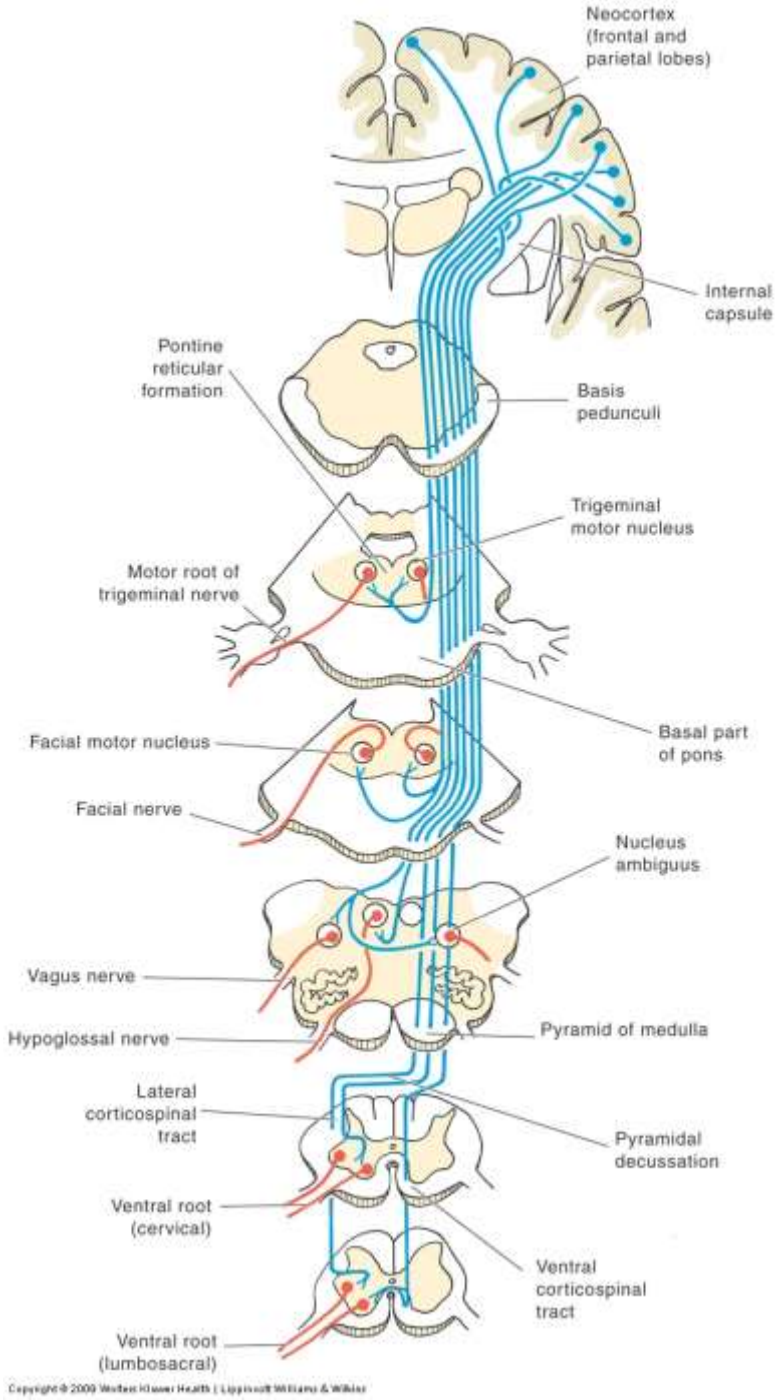
Corticospinal Tract

• Control of precision and speed of skilled movements, particularly of distal limb muscles (e.g. digits).

• Tract forms visible ridges referred to as the ‘pyramids’ on the anterior surface of the medulla, so also called the **pyramidal tract**. About 85% of fibres cross in the caudal medulla at the **decussation of the pyramids**.

• Crossed fibres form the **Lateral** CST.

• Uncrossed fibres form the **Ventral** CST, which cross segmentally.



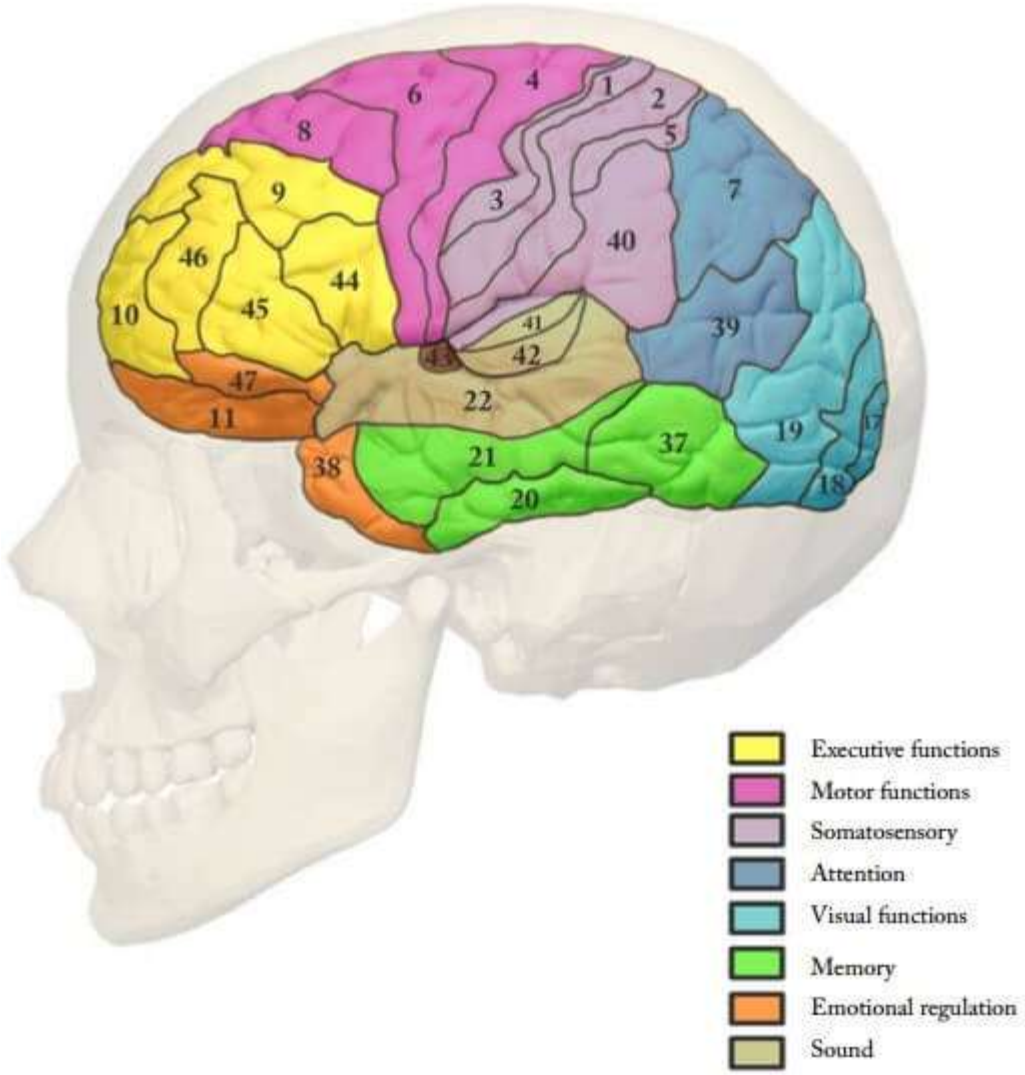
Lateral Corticospinal (pyramidal) Tract

2. Origin and termination:

Origin:

• Arises from lamina V of the cerebral cortex from three cortical areas, in equal proportions:

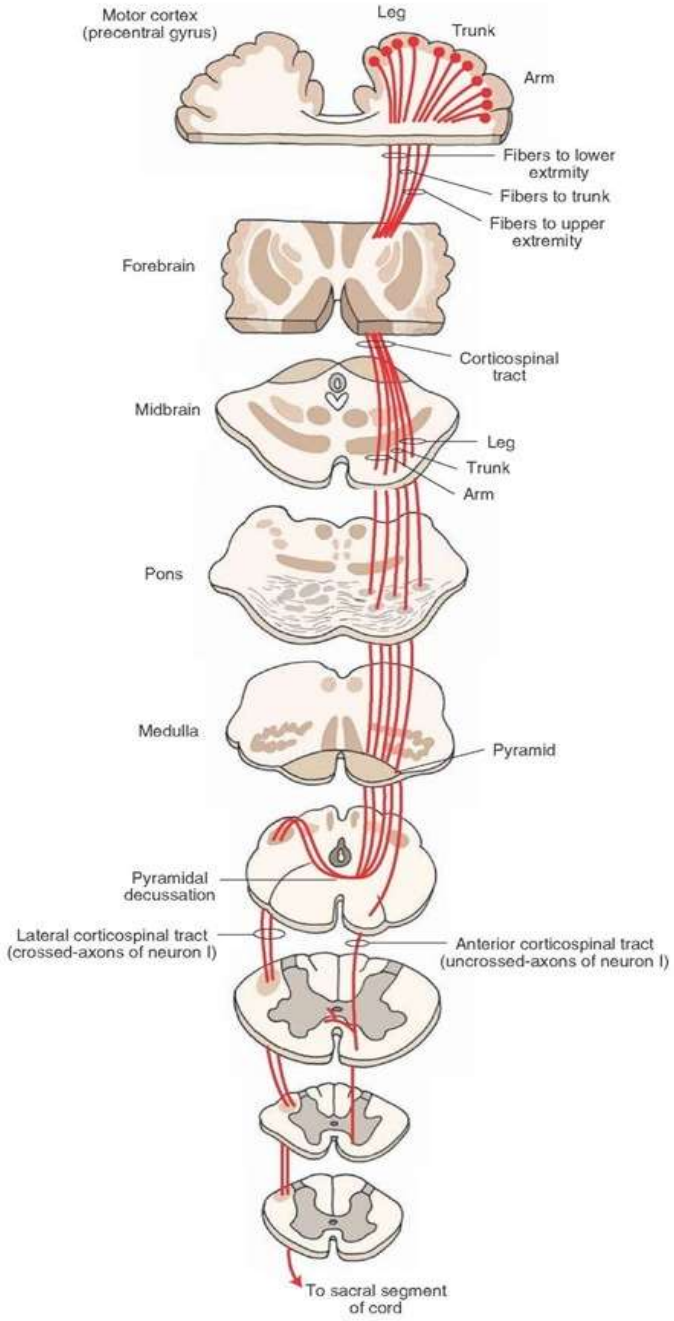
- ✓The premotor cortex (area 6);
- ✓The precentral motor cortex (area 4);
- ✓ And the postcentral sensory cortex (areas 3, 1, and 2)



VENTRAL Corticospinal (pyramidal) Tract

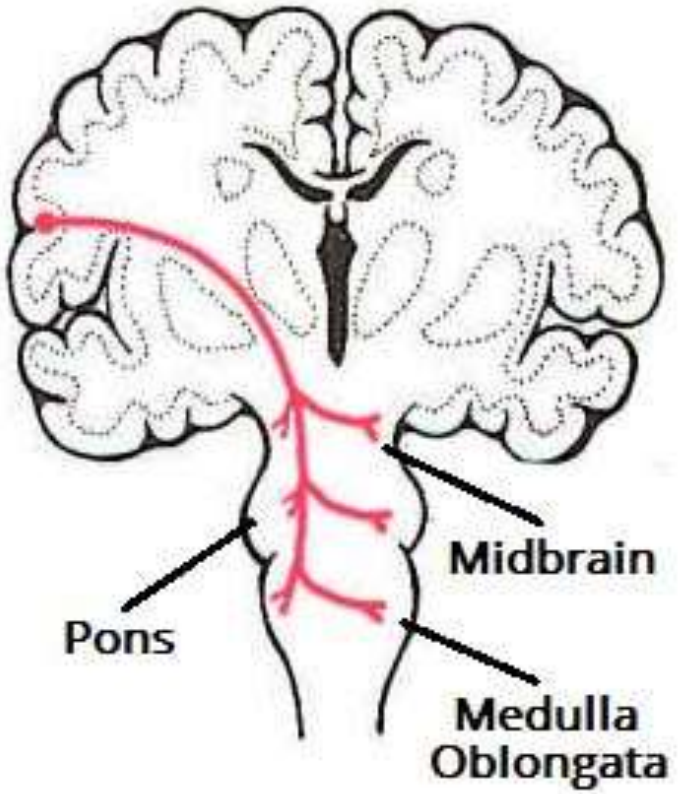
- IS A SMALL UNCROSSED TRACT THAT DECUSSATES AT SPINAL CORD LEVELS IN T VENTRAL WHITE COMMISSURE.

- IS CONCERNED WITH THE CONTROL OF AXIAL MUSCLES.



Corticobulbar (Corticonuclear) Fibers

- Arise from precentral and postcentral gyri.
- Corticobulbar tract supplies upper motor neuron innervation to the cranial nerves supplying head and face Corticobulbar tract supplies input bilaterally to trigeminal, facial, and hypoglossal nerve nuclei



Rubrospinal tract

- Arises in the contralateral red nucleus of the midbrain.
- Plays a role in the control of flexor tone.
- Is ventral to the lateral corticospinal tract.

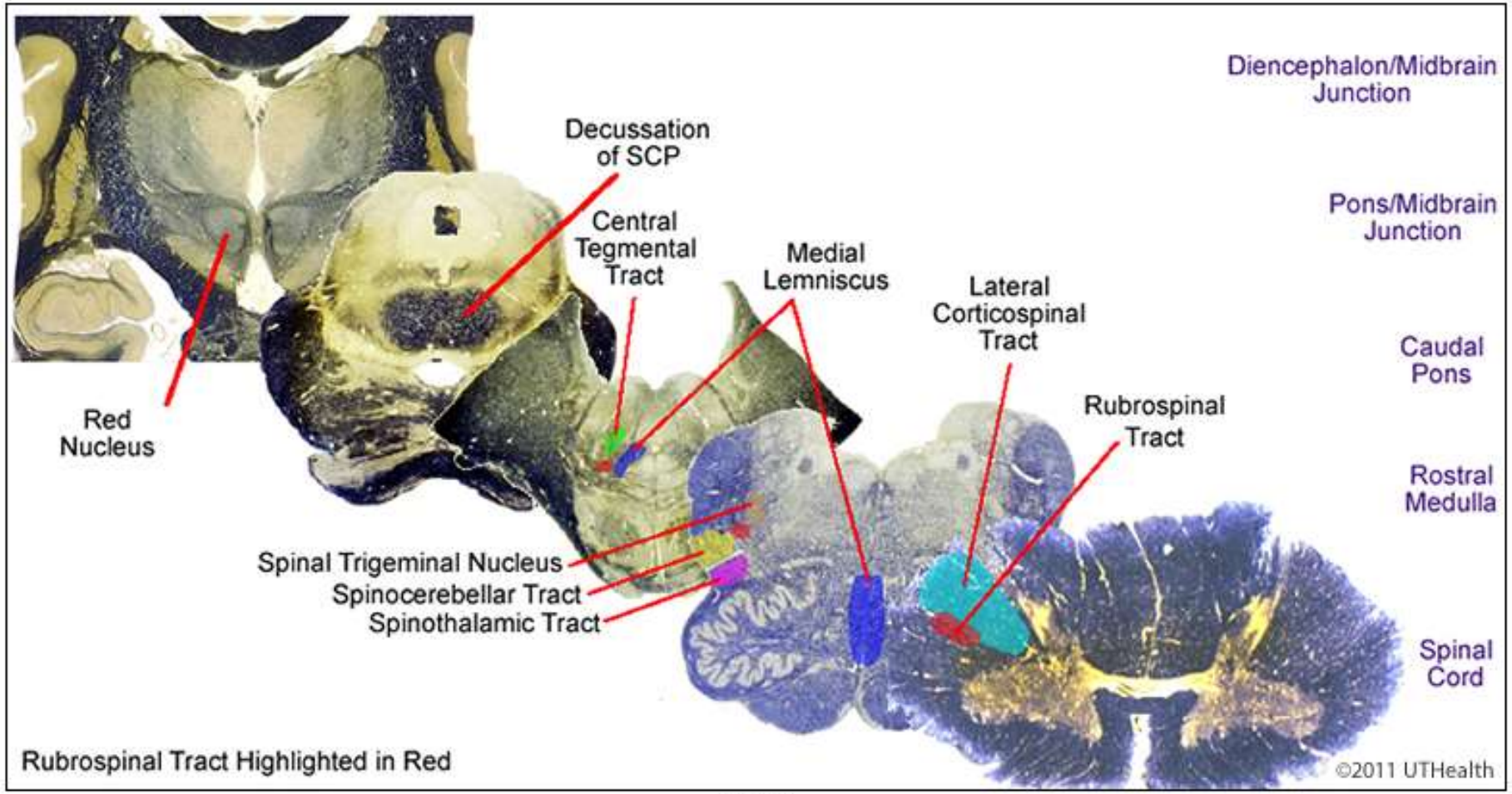
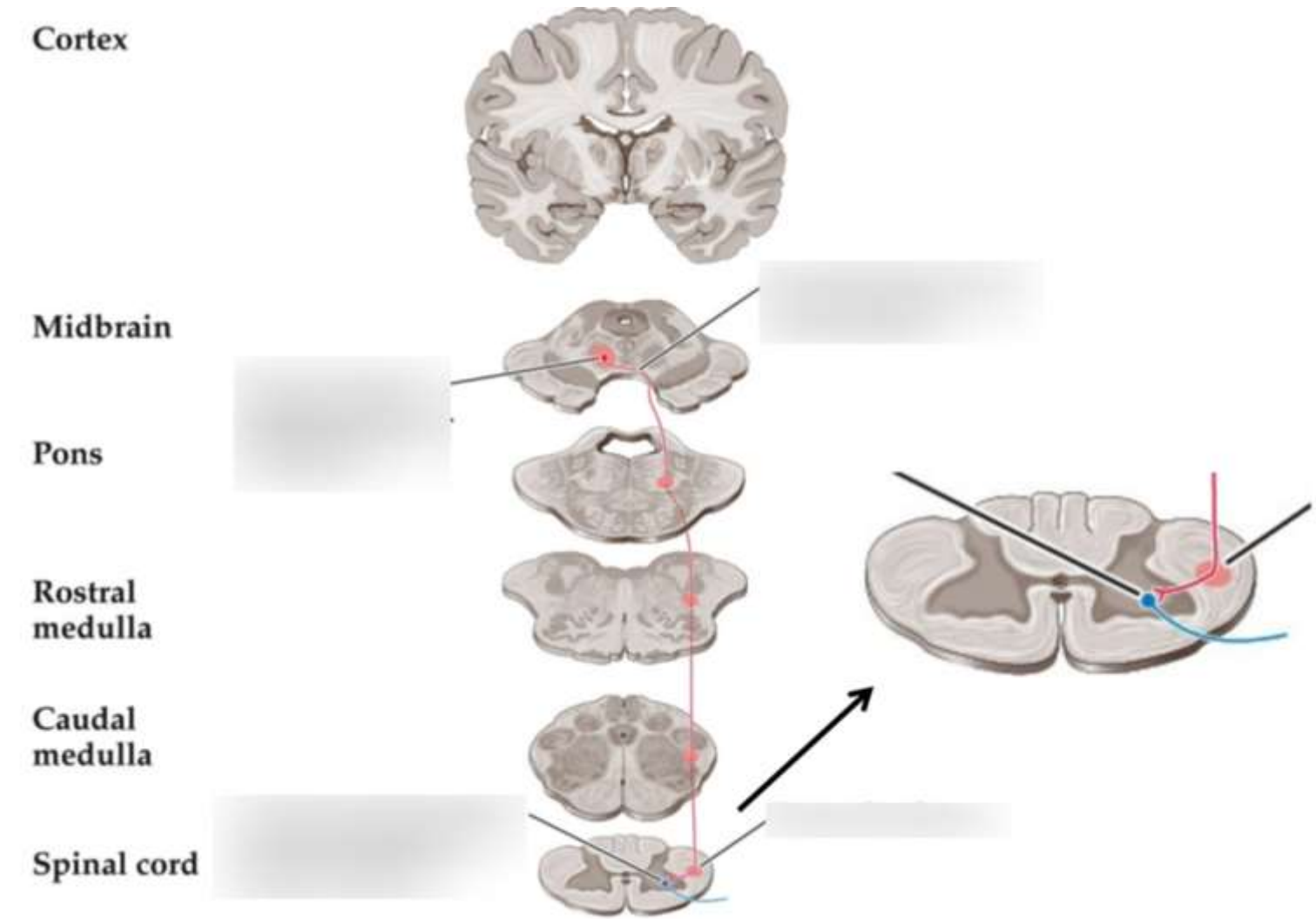


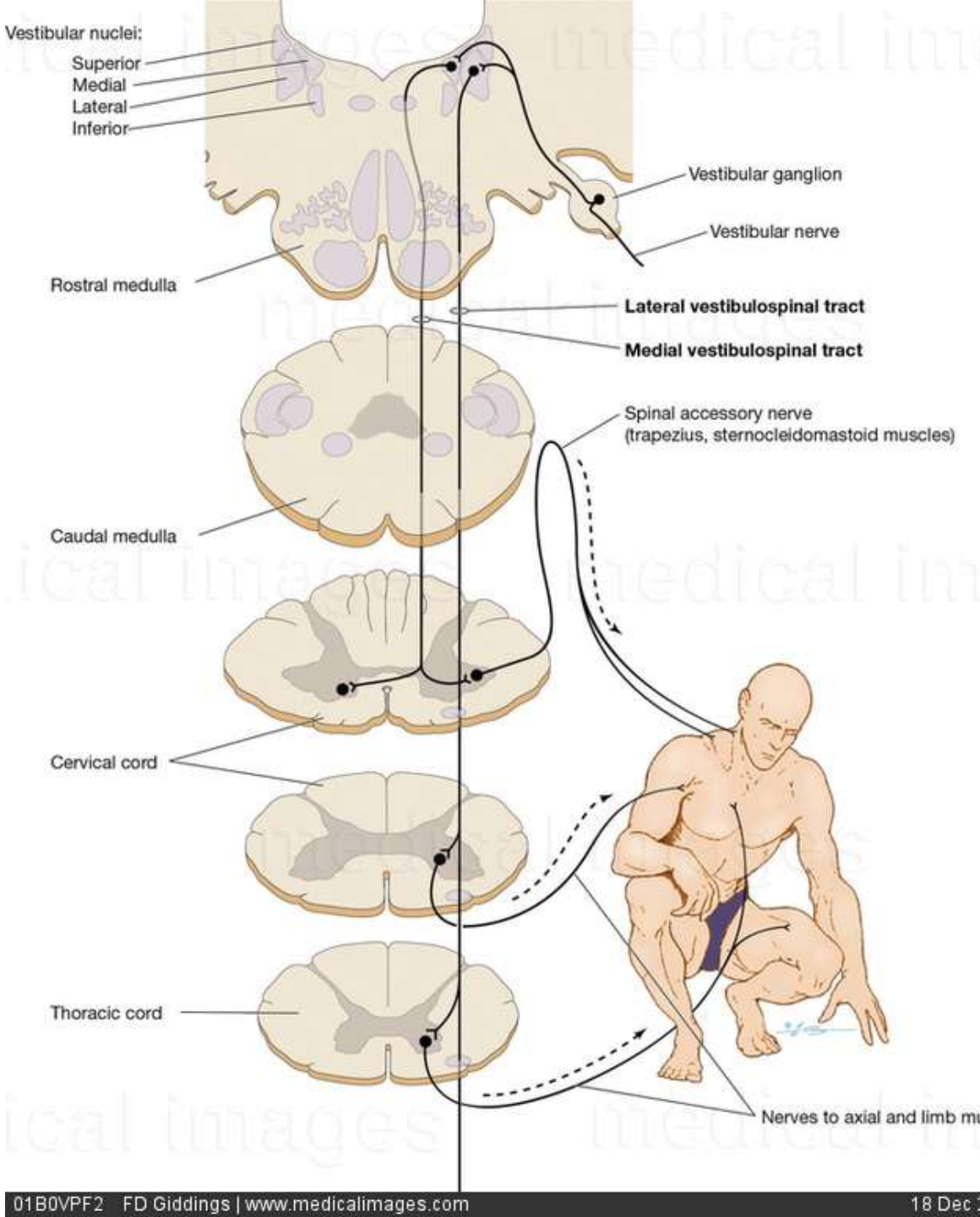
Figure 1



(B) **Rubrospinal tract**

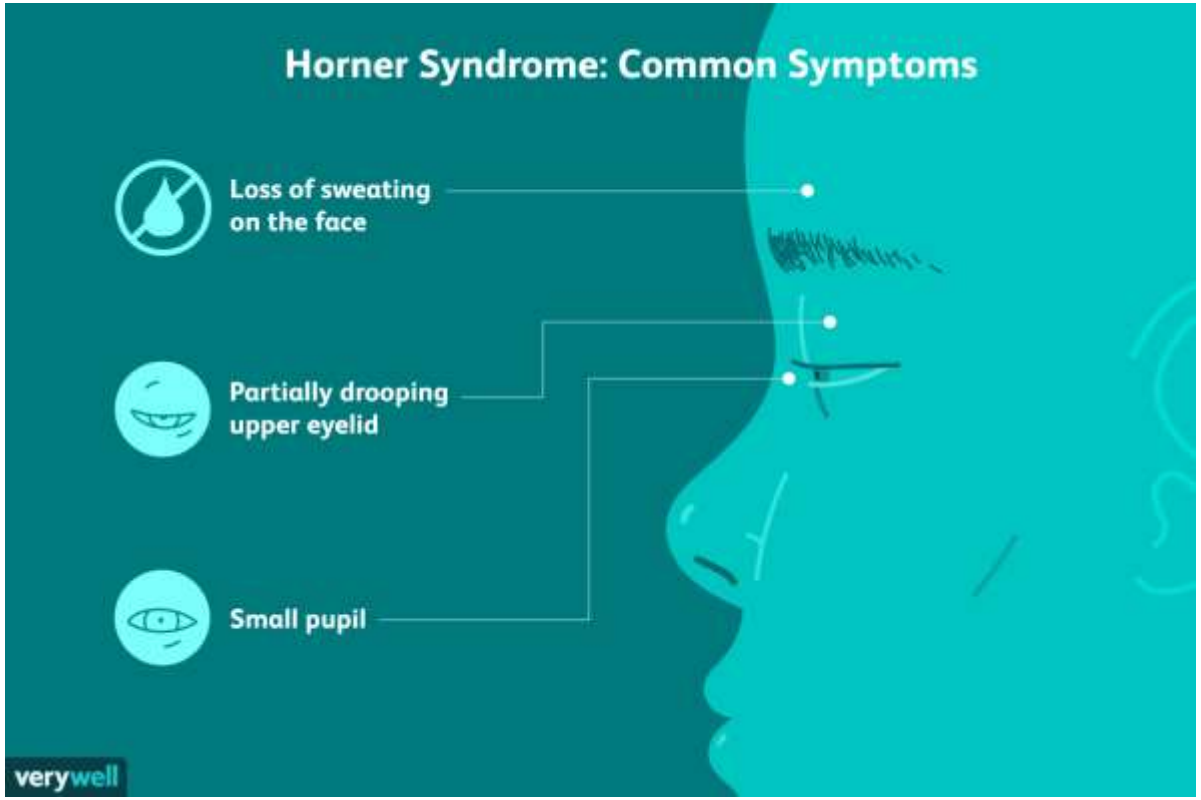
Vestibulospinal Tract

- Arises from the giant cells of Deiters in the ipsilateral lateral vestibular nucleus.
- Plays a role in the control of extensor tone
- Is located in the ventral funiculus.



Descending autonomic tracts

• project to sympathetic (T1–L3) and parasympathetic (S2–S4) centres in the spinal cord.
• innervate :
✓ The ciliospinal center (T1–T2),
✓ a pupillary center;
• interruption of this tract results in Horner syndrome.



TRACT	Function	ORIGIN	CROSSED ?	End	NOTE
Lateral CorticoSpinal Tract	carries motor signals from the primary motor cortex in the brain, down the spinal cord, to the muscles of the trunk and limbs.	1. premotor cortex (area 6) 2. precentral motor cortex (area 4) 3. postcentral sensory cortex (areas 3, 1, and 2)	YES	Contralateral dorsal quadrant of the lateral funiculus of the spinal cord	1. not fully myelinated until the end of the second year 2.Transection results in spastic hemiparesis with the Babinski sign
Ventral CorticoSpinal tract	control of axial muscles.	Same as above {SAME SIDE OF CORTEX}	NO	Ipsilateral ventral white matter in spinal cord	Smaller than Lateral corticospinal tract
CORTICOBULBAR tract	carries **efferent**, motor, information from the primary motor cortex to the muscles of the face, head and neck	**Primary motor cortex** **Premotor cortex** **Supplementary motor area**	**Only 50% of the corticobulbar fibers decussate**	BRAIN STEM	

TRACT	Function	ORIGIN	CROSSED?	End	NOTE
Rubrospinal tract	plays a role in the control of flexor tone.	arises in the contralateral red nucleus of the midbrain	YES	Spinal cord white matter	is ventral to the lateral corticospinal tract
Vestibulospinal tract	plays a role in the control of extensor tone.	ipsilateral lateral vestibular nucleus	NO	located in the ventral funiculus.	
Descending autonomic tracts	1.innervate the ciliospinal center (T1–T2), a pupillary center	project to sympathetic (T1–L3) and parasympathetic (S2–S4) centers in the spinal cord.			interruption results in Horner syndrome.

From: Natural History Museum