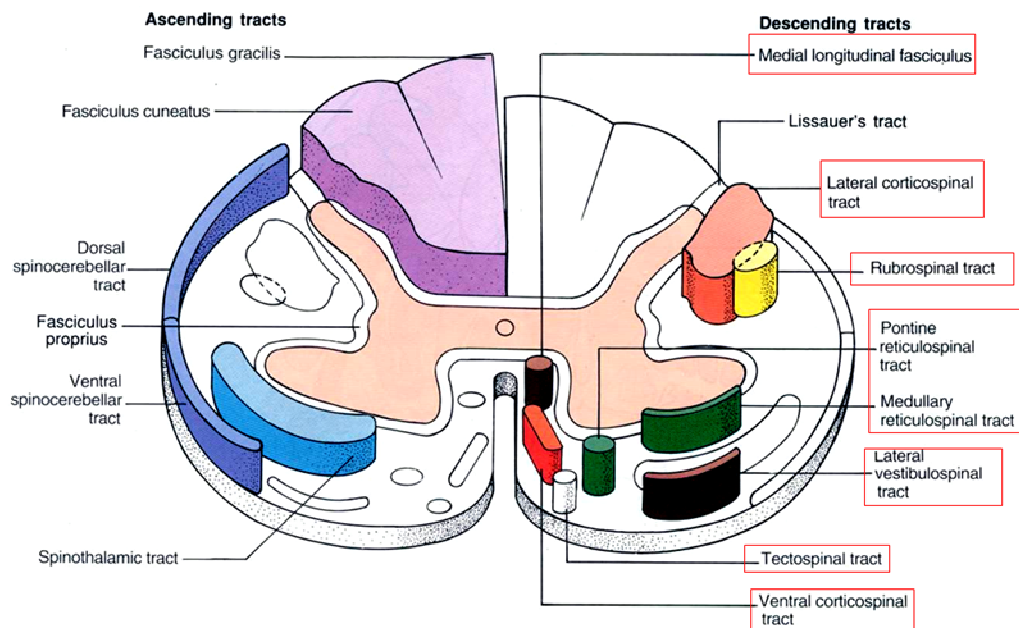


DESCENDING SPINAL TRACTS

DESCENDING TRACTS OF THE SPINAL CORD :



- **Major Descending Tracts :**
 - Corticospinal Tracts.
 - Rubrospinal Tract.
 - Vestibulospinal Tracts.
 - Tectospinal Tract.
 - Reticulospinal Tract.

CHARACTERISTICS OF DESCENDING TRACTS :

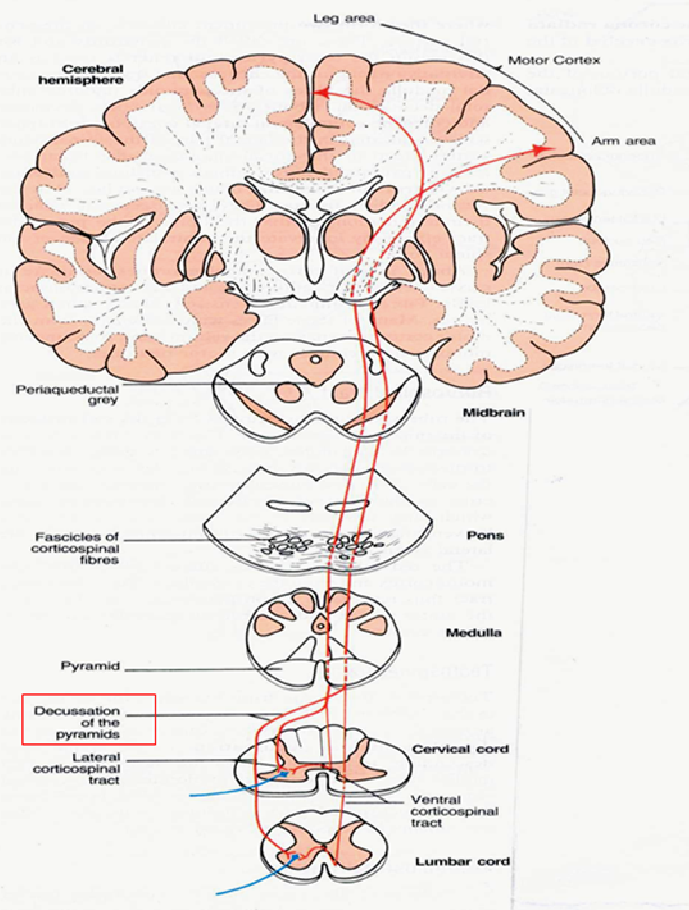
- **Origin :** from cerebral cortex & brainstem.
- **Concerned with :**
 - Control of movement.
 - Muscle tone.
 - Spinal reflexes.
 - Autonomic functions.

CORTICOSPINAL (PYRAMIDAL) TRACTS :

- Concern with the control of voluntary, discrete, skilled movements, especially those of distal part of the limbs, such movements are sometimes referred to as 'fractionated' movements.
- The cells of the origin are widely distributed in the motor & sensory cortices, including the precentral gyrus or **primary motor cortex** where the large **Betz cells** give rise to the largest diameter corticospinal axons.
- Fibres pass through corona radiata → internal capsule → crus cerebri → ventral part of pons → medulla.
- In Caudal medulla :
 - 75%-90% of fibres decussate → Lateral Corticospinal tract (contralateral), which is located in the lateral part of the spinal white matter, deep to the dorsal spinocerebellar tract.
 - 10%-25% remain ipsilateral (Ventral corticospinal tract), located lateral to ventral median fissure.
 - So as result, the fibers of the pyramidal tract effectively innervate the contralateral side of the spinal cord.

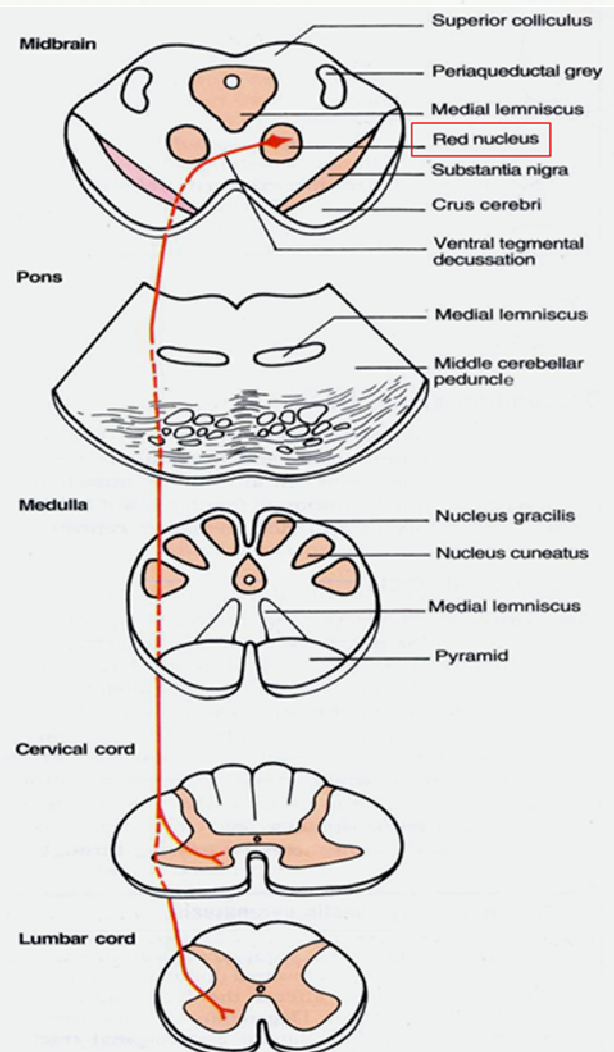
TERMINATION OF CORTICOSPINAL TRACTS :

- 55% of fibres terminate at Cervical levels.
- 20% of fibres terminate at thoracic levels.
- 25% of fibres terminate at lumbosacral levels.
- The fiber terminate extensively in the spinal grey matter.



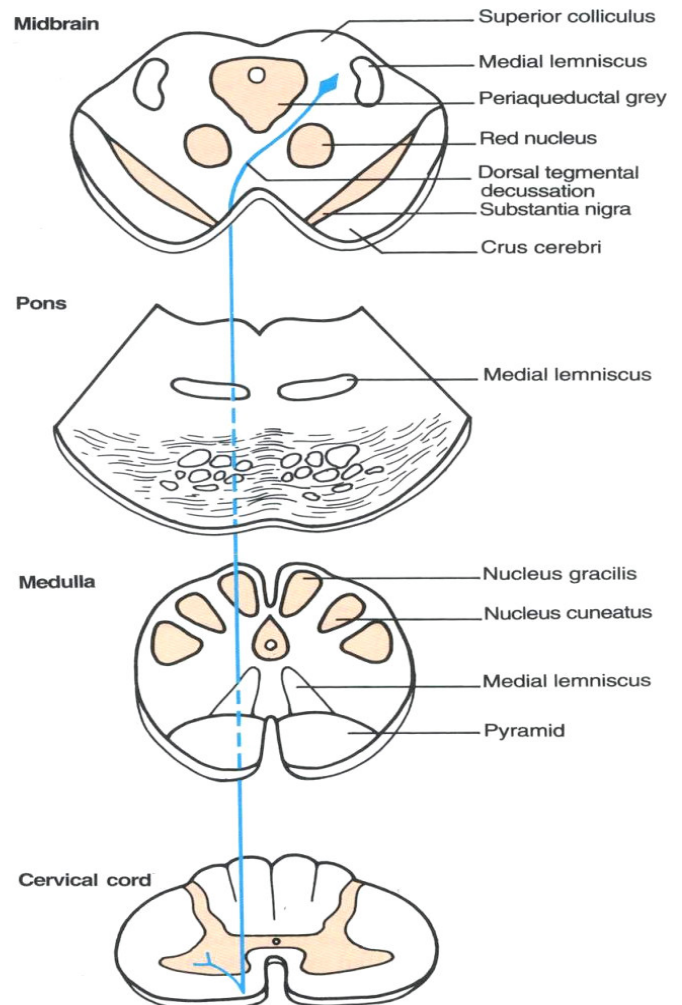
RUBROSPINAL TRACT :

- **Origin** : from red nucleus.
 - Red nucleus receives fibres from cerebral cortex & cerebellum.
- **Pathway** : from red nucleus → crossover in ventral tegmental decussation → spinal cord.
- **Location** : lies ventrolateral to, and partly intermingled with, Lateral corticospinal tract.
- **Function** : exerts control over tone of flexor limb muscles, being excitatory to the motor neuron of these muscle.
- Therefore, The tract represent non-pyramidal route by which the motor cortex and cerebellum can influence spinal motor activity.



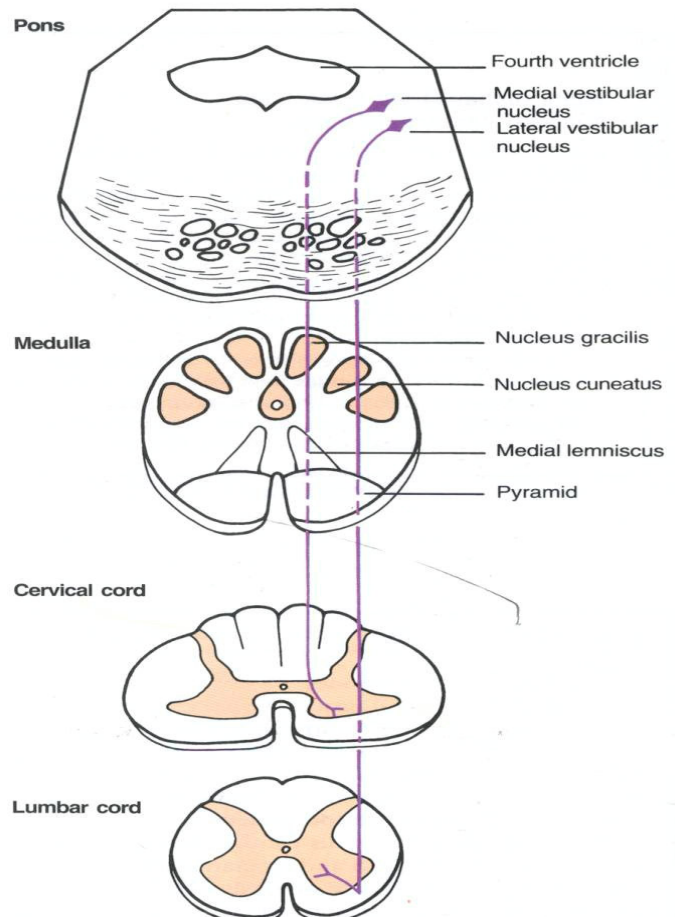
TECTOSPINAL TRACT :

- **Origin** : superior colliculus.
- **Pathway** : fibres pass forwards & medially :
 - Cross in dorsal tegmental decussation.
 - Descend in anterior funiculus, near ventral median fissure.
- **Terminates** mainly in cervical segments (esp. on spinal nucleus of XI).
- **Function** : reflex movements in response to visual input and the tectospinal tract is thought to mediate reflex movements in response to visual stimuli.



VESTIBULOSPINAL TRACT :

- **Origin** : Vestibular nuclei (in pons & medulla) and near the floor of the 4th ventricle.
 - Inputs from labyrinth (via CN VIII) and cerebellum.
- **Pathway** : axons of cells in Lateral Vestibular (Deiters') nucleus → descend ipsilaterally as lateral vestibulospinal tract, which is located in the ventral funiculus. Lateral vestibular tract fibers mediate excitatory influence upon extensor motor neuron. They serve to control extensor muscle tone in the anti-gravity maintenance of posture.
- The medial vestibular nucleus contributes descending fibres to the ipsilateral medial longitudinal fasciculus (MLF), also known as the medial vestibulospinal tract, which is located adjacent to the ventral median fissure.
- **Function** :
 - Excitatory to extensor muscles.
 - Controls extensor muscle tone in antigravity maintenance of posture.



RETICULOSPINAL TRACT :

- **Origin :** reticular formation of pons & Medulla.
- **Pathway :**
 - Axons from Pontine RF → **ipsilateral** → medial reticulospinal tract.
 - Axons from Medullary RF → **bilateral** → Lateral reticulospinal tract.
- **Both tracts run in anterior funiculus.**
- **Functions :**
 - By controlling both α and γ motor neurones :
 - Influence voluntary movement.
 - Reflex activity & muscle tone.
 - Pressor and depressor effects on the CVS.
 - Control of breathing.



THE END

LoveTomy Team 426

Team leader : Dr. hams

Dr. S Dr. noop Omar H

ابنسم !! همي بروحي

M.A.M Abo Slo7 Cute Killer

SELF QUIZ

1- Regarding the Corticospinal Tracts, all are true EXCEPT :

- a. Concern with the control of voluntary skilled movements.
- b. At cervical levels, more than half of fibres are terminated.
- c. Fibres pass through corona radiata, and not all of them will decussate.
- d. 75%-90% of fibres decussate to lateral corticospinal tract in rostral medulla.
- e. The large Betz cells give rise to the largest diameter corticospinal axons.

2- Regarding the Rubrospinal Tract, all are true EXCEPT :

- a. It exerts control over tone of flexor limb muscles.
- b. It excites the motor neuron of flexor limb muscles.
- c. Origin from red nucleus.
- d. Lateral corticospinal tract lies posteromedial to it.
- e. Crossover in ventral tectal decussation.

3- Regarding the Tectospinal Tract, all are true EXCEPT :

- a. Origin from midbrain.
- b. At cervical segments, most of its fibres are terminated on spinal nucleus of accessory nerve.
- c. Fibres pass forwards & medially, and cross in ventral tegmental decussation.
- d. Fibres descend in anterior column.
- e. Reflex movements in response to visual stimuli.

4- Regarding the Vestibulospinal Tracts, all are true EXCEPT :

- a. Origin from Vestibular nuclei.
- b. It gets inputs from labyrinth via statoacoustic nerve.
- c. Axons of cells in Deiters' nucleus descend ipsilaterally as lateral vestibulospinal tract.
- d. Medial vestibular tract fibers excite extensor motor neuron.
- e. They control extensor muscle tone in the anti-gravity maintenance of posture.

5- Regarding the Reticulospinal Tracts, all are true EXCEPT :

- a. Origin from reticular formation of pons & Medulla.
- b. Control of breathing by controlling both α and γ motor neurones.
- c. Axons from Pontine reticular formation run ipsilateral and give medial reticulospinal tract.
- d. Axons from Medullary reticular formation run contralateral and give Lateral reticulospinal tract.
- e. Have a depressor effects on the CVS.

1. d	2. e	3. c	4. d	5. b
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