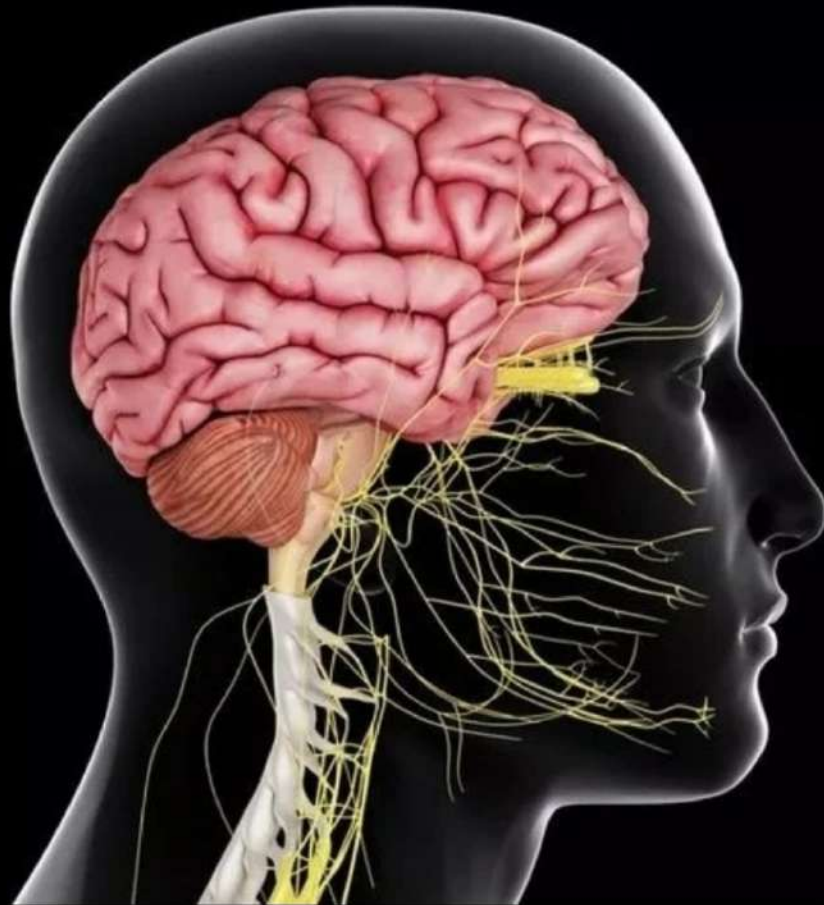




CENTRAL NERVOUS SYSTEM



SUBJECT : Anatomy

LEC NO. : 4

DONE BY : Raha Dwairi

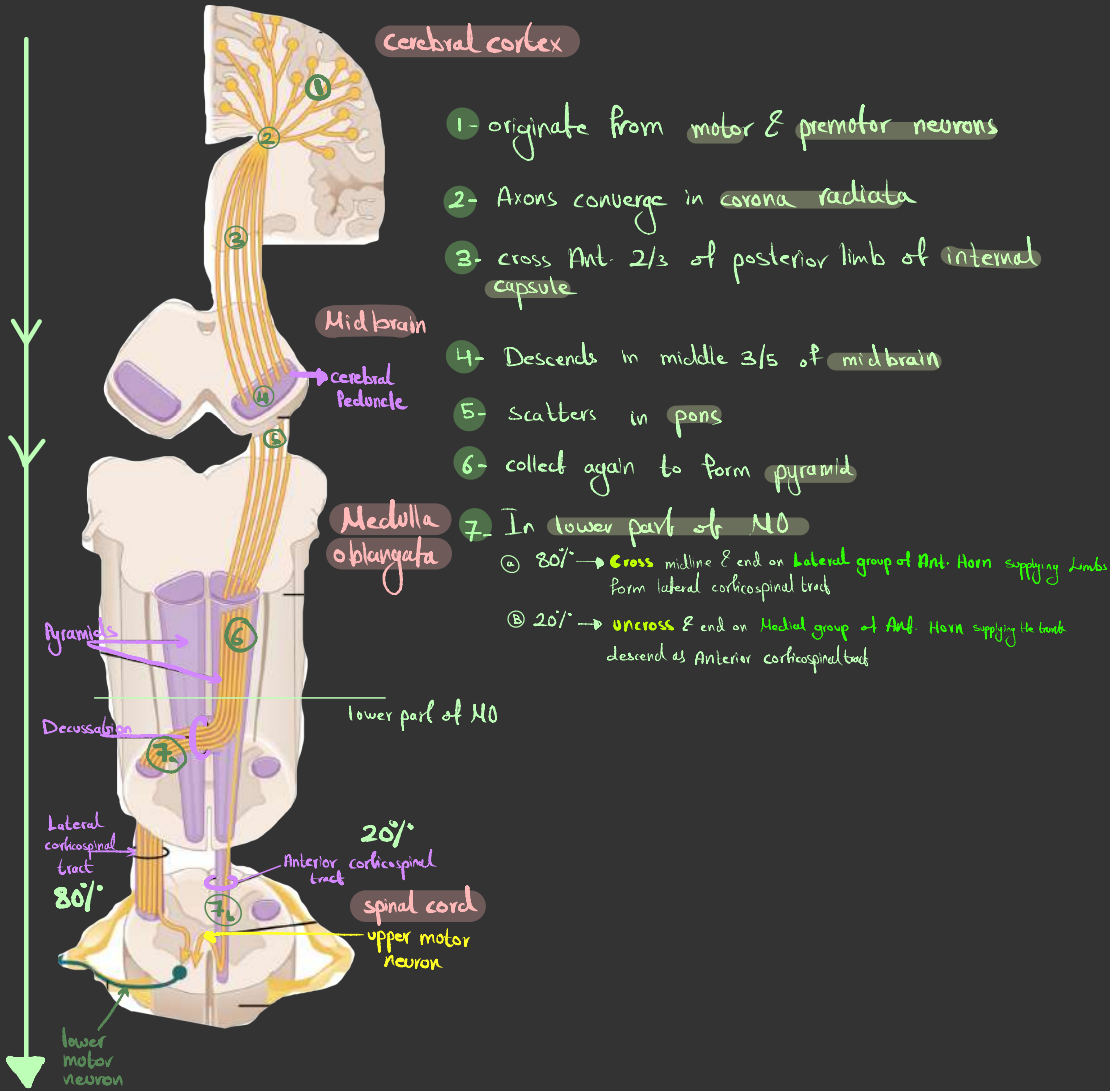
وَقُلْ رَبِّ زِدْنِي عِلْمًا

Descending tracts

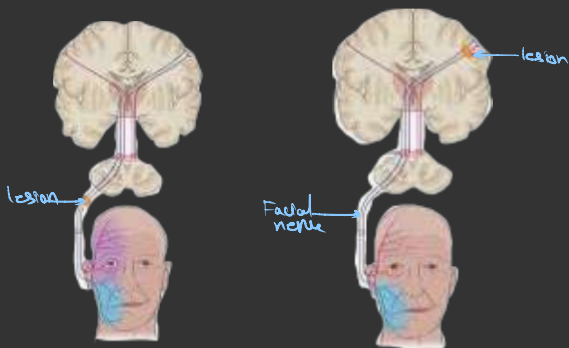
Pyramidal tract

"voluntary movements"

1 corticospinal tract (Lateral & Anterior)



2 corticobulbar tract "corticocranial tract"



All cranial nerve nuclei receive **Bilateral** corticobulbar

Except:

Facial nucleus → supplies muscle of lower part of face

Hypoglossal nucleus → supplies genioglossus

Both receive contralateral supply only:

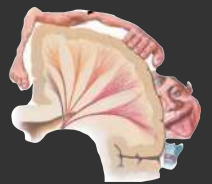
Lamination of pyramidal Tract:

Lamination in:

cerebral cortex → upside down

internal capsule → upper limb Anterior, lower limb post.

Brain stem & spinal cord → cervical are medial, sacral are lateral

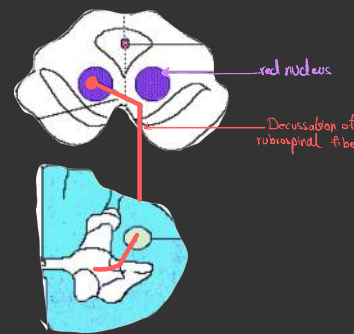


extrapyramidal tract

"Muscle tone, Posture, semiautonomic, swinging the arm"

- Descending tracts that influence AHC
- named according to the started point
- could be crossed, uncrossed, or combination
- could be excitatory or inhibitory

Rubrospinal tract



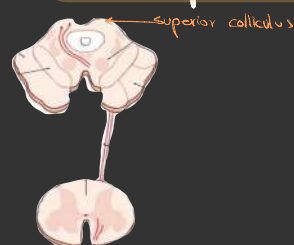
origin: Red nucleus

Decussate: ventral part of Midbrain

Lies in: lateral white column of cervical segment

Function: Facilitate flexors of upper limb

Tectospinal tract



origin: Superior colliculus

Decussation: Dorsal of midbrain

End in: medial group of cervical AHC

Function: Turn Head & Neck in response to visual & Auditory response

Reticulospinal Tract

Medial & Lateral tracts

vestibulospinal tract

Medial & Lateral Tracts
Responsible of Balance

Anterior spinal Artery

Origin: single branch formed by union of 2 ant. spinal Arteries, Branches from vertebral Artery

Course: Ant. median fissure of s.c

Distribution: Ant. 2/3 of cross sectional of s.c

- Ant. & lateral white column
- ventral, lateral, Base of Dorsal horn

Posterior spinal Artery

commonly from PICA
maybe from vertebral A.

Descends from foramen magnum along posterolateral sulcus dividing into Ant & post branches descending along Dorsal root of spinal N

Post 1/3 of s.c

- Post White column
- Post Horn

Radicular (segmental) Artery

Ascending cervical Artery
Posterior intercostal Artery
1st lumbar Artery

Some of Radicular Arteries may be large and called: feeder Arteries

one of them arise from 11th intercostal A and may be main supply of lower 2/3 of cord

Arterial supply of spinal cord

Upper & Lower Motor Neuron Lesions

Upper motor neuron: neurons from cerebral cortex $\xrightarrow{\text{Descends}}$ AHC or Motor nuclei of cranial N.

Lower motor neuron: neurons of AHC or motor cranial nerve nuclei

	Upper Motor Neuron Lesion [UMNL]	Lower Motor Neuron Lesion [LMNL]
Means	Lesion of the pyramidal tract e.g. capsular hemiplegia. <i>(internal capsule)</i>	Lesion of AHCs or motor cranial nuclei e.g. poliomyelitis.
Movements	Only voluntary movements are lost while the involuntary & emotional movements are intact i.e. it is Paralysis of movement	All movements are lost & the muscle cannot be moved by any means i.e. it is Paralysis of muscle
Muscle tone	Clasp knife spasticity occurs due to interruption of inhibitory fibers (from area 4 S) which suppress the stretch reflex arc	Hypotonia [flaccidity] occurs due to Interruption of the stretch reflex arc
Tendon jerks	Exaggerated & clonus may occur.	Lost.
Superficial reflexes	Abdominal & cremasteric reflexes are absent	Usually not affected
Plantar response	Extensor response [+ve Babinski sign] = scratching the lateral side of foot causes dorsiflexion of big toe & fanning of outer toes	Lost N.B: the normal plantar response is flexion of all the toes
Atrophy	Does not occur	Disuse atrophy occurs

Note:

cervical part of S.C supplied by
 → Anterior spinal A. (ASA)
 → Posterior spinal A. (PSA)

Lower segments of S.C supplied by
 → Radicular Arteries

- Most liable to become ischemic → Mid thoracic segments
- Richest Blood supply of segments → Lumbar region

Spinal cord Lesions

complete transverse section

- Above C5 → paralysis of Diaphragm
- C5 - T2 → Quadriplegia
- Below T4 → paraplegia

Hemisection of spinal cord

Brown sequard syndrome

- At level of lesion:
 - loss of all sensations (ipsilateral) *Damage of Dorsal root*
 - LMNL (ipsilateral) *Damage of Ant. Horn*
- Below level of lesion (ipsilateral)
 - Loss of proprioceptive sensa
 - UMNL ⇒ effect of lateral corticospinal tract
- Below level of lesion (contralateral)
 - loss of pain & temperature Due to affection of lateral spinothalamic tract

Anterior spinal occlusion syndrome

- Bilateral UMNL paralysis
- Bilateral loss of pain & temperature
- preservation of Dorsal column tract (proprioception + touch)

Syringomyelia

- jackpot pain & Temperature**
- cavitation around central canal in cervical & upper thoracic segments
- degeneration of crossing fibers carrying pain & Temp
- Bilateral loss of pain & temperature sensation