



CENTRAL NERVOUS SYSTEM – Spinal Cord High-Yield Summary

External Features

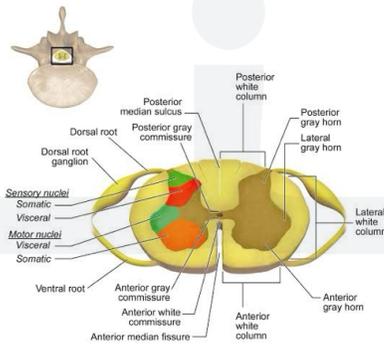
- Lower subdivision of CNS; lies in vertebral canal; elongated and cylindrical.
- Length ~45 cm; begins below foramen magnum as continuation of medulla.
- Ends as conus medullaris (L1–L2 in adults). Cauda equina below.
- Lumbar puncture done at L3–L4.

Enlargements

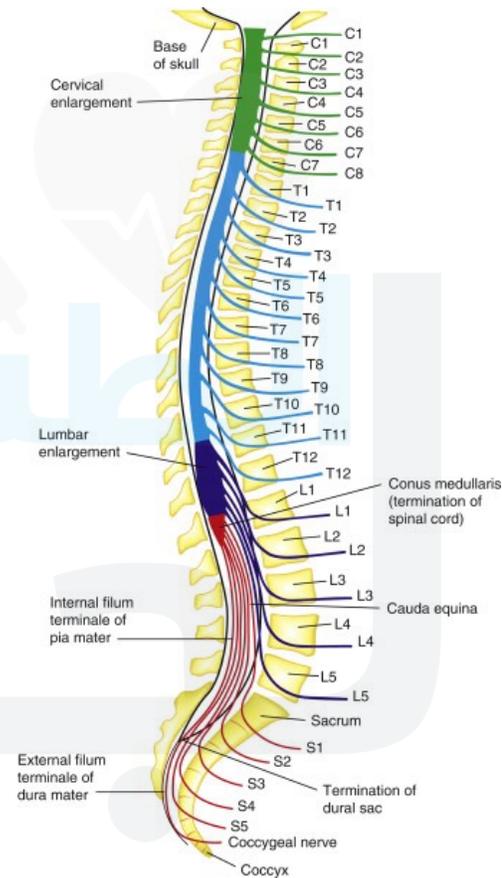
- Cervical enlargement → gives cervical & brachial plexuses.
- Lumbosacral enlargement → gives lumbar & sacral plexuses.

Surface Features

- Anterior median fissure (deep).
- Posterior median sulcus (shallow).
- Anterolateral sulci → motor roots.
- Posterolateral sulci → sensory roots.



Sectional Organization of the Spinal Cord

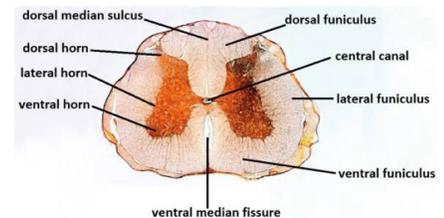


Spinal Cord Segments

- 31 segments: 8C, 12T, 5L, 5S, 1Co; each gives one spinal nerve pair.

Spinal Nerves

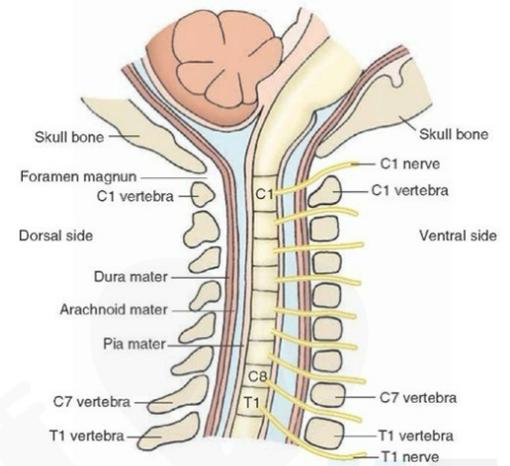
- Ventral root → motor; dorsal root → sensory (medial part to gracile/cuneate, lateral to posterior horn).



- Roots unite → spinal nerve → divides into dorsal & ventral rami.

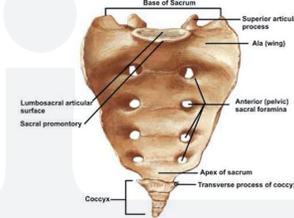
Segment-Vertebra Relations

- C8 opposite C7 (Segment = Vertebra +1).
- T6 opposite T4 (Segment = Vertebra +2).
- T12 opposite T9 (Segment = Vertebra +3).
- Lumbar segments opposite T10-T11.
- Sacral & coccygeal opposite T12-L1.

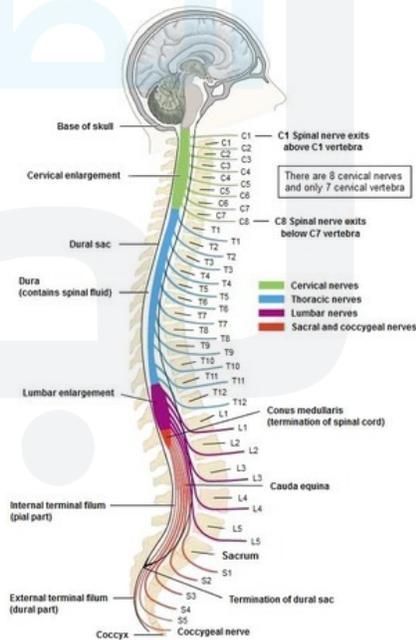


Exit of Spinal Nerves

- C1-C7 exit above corresponding vertebra; C8 exits below C7.
- Thoracic & lumbar exit below corresponding vertebra.
- S1-S4 via sacral foramina; S5 & Co via sacral hiatus.

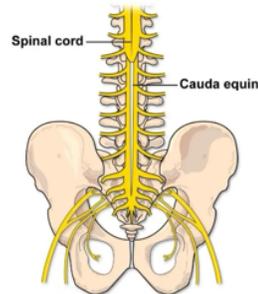


Spinal Nerve Root Relation to Vertebra



Cauda Equina

- Long vertical roots (lumbar, sacral, coccygeal); lies in subarachnoid space.

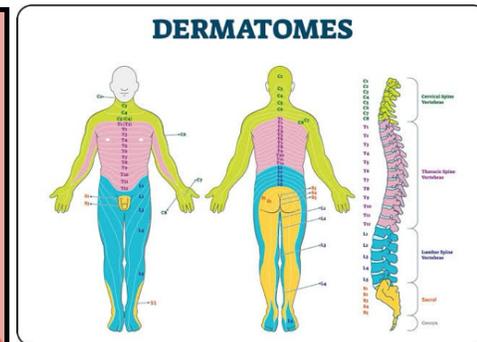
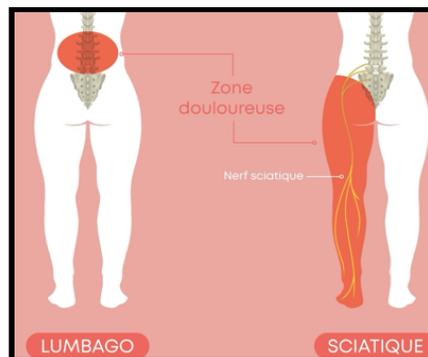


Dermatome & Lumbago

- Dermatome = skin area supplied by one spinal nerve.
- Lumbago/Sciatica due to compression of sacral nerves.

Internal Structure

General



- Central canal with CSF; grey matter inside, white outside.
- Connected by anterior grey, posterior grey, and anterior white commissures.

Grey Matter

- H-shaped; anterior, posterior, lateral horns.
- Lateral horn in thoracic + upper lumbar segments.

Anterior Horn

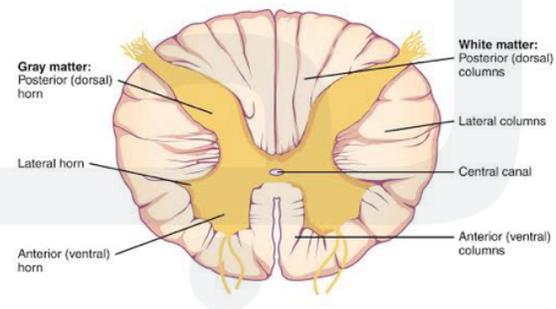
- Motor: medial (trunk), lateral (limbs), central (phrenic + accessory).

Lateral Horn

- Preganglionic autonomic fibers: sympathetic (T & upper L), parasympathetic (S2–S4).

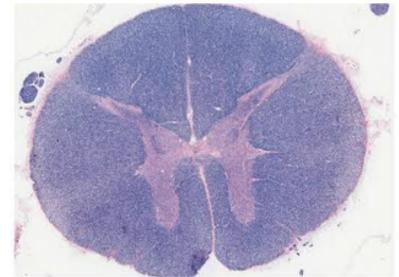
Posterior Horn

- Substantia gelatinosa → pain & temp → lateral spinothalamic.
- Nucleus proprius → touch & pressure → anterior spinothalamic.
- Clarke's nucleus → proprioception → spinocerebellar tracts.



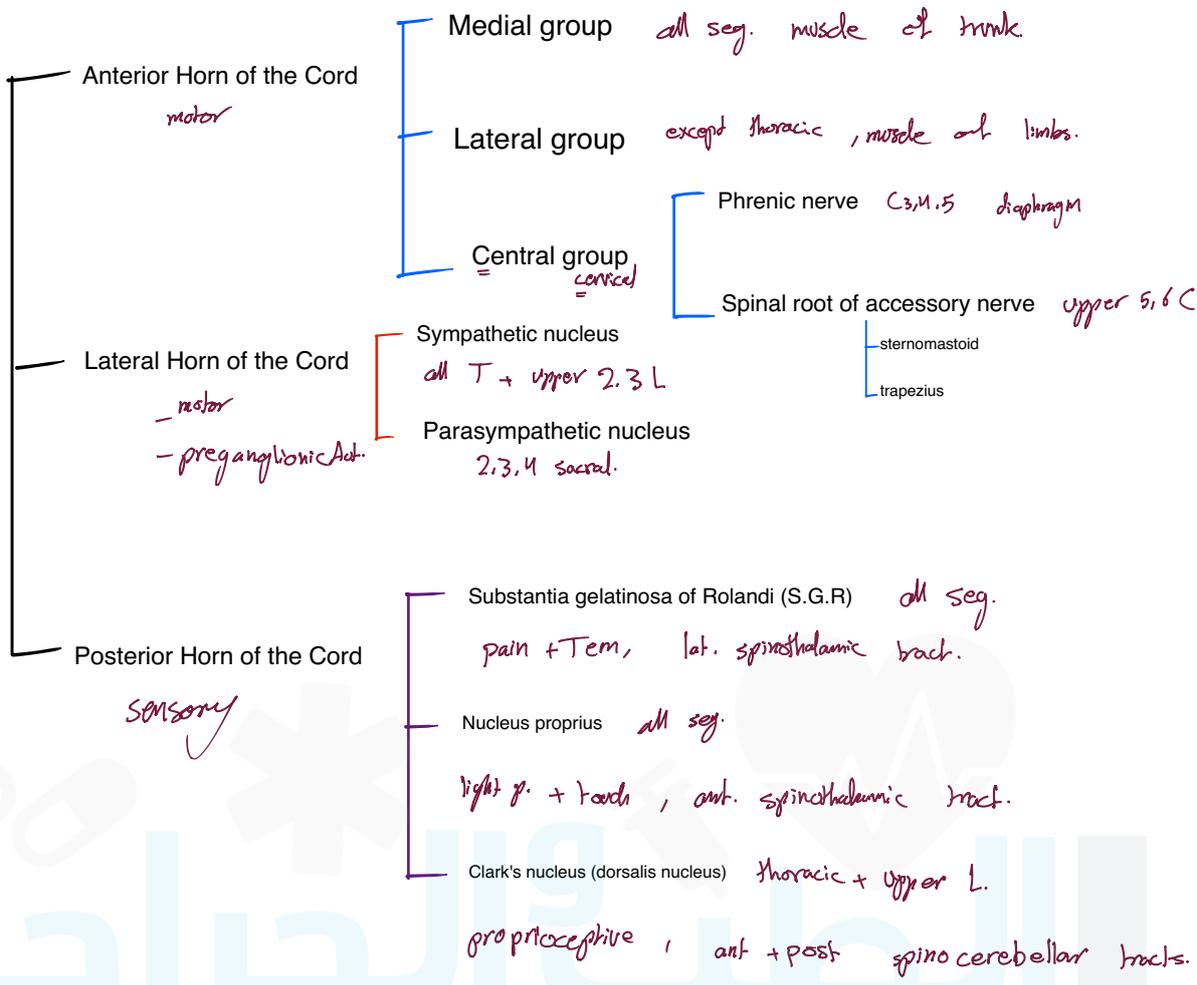
White Matter

- Posterior column → ascending tracts.
- Lateral column → ascending & descending tracts.
- Anterior column → descending tracts.

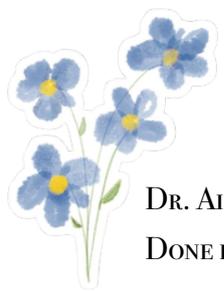
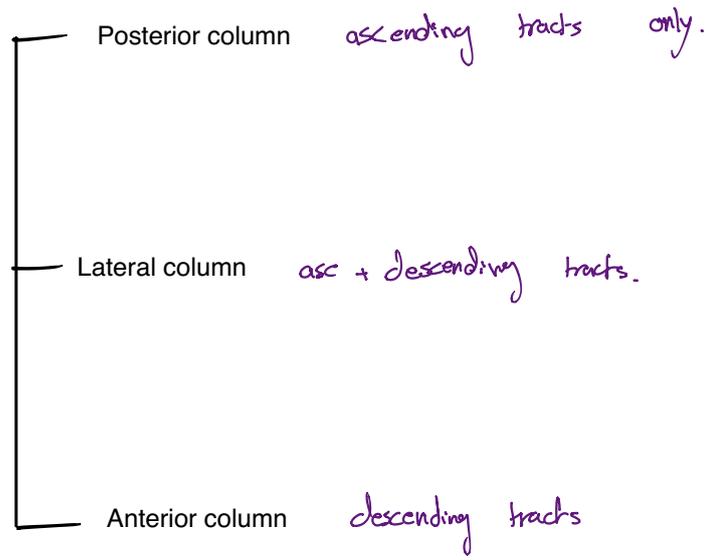


* grey matter

matter



* White matter



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DONE BY : RAGHAD MRAYAT

ونخاف أن نموت ونفنى ولا يبقى لنا أثر ، ونخاف أن نموت ونفنى ولا يبقى لنا عمل نُؤجّر عليه ، ونخاف أن نموت ونفنى فنكون من ضلّ سعيهم في الحياة الدنيا وهم يحسبون أنهم يحسنون صنعا .
رَبَّنَا ثَقِِّلْ مَنَّا ، وَاسْتَعْمِلْنَا وَلَا تَسْتَبْدِلْنَا ، وَوَقِّفْنَا ، وَدَلَّنَا عَلَى الْخَيْرِ

