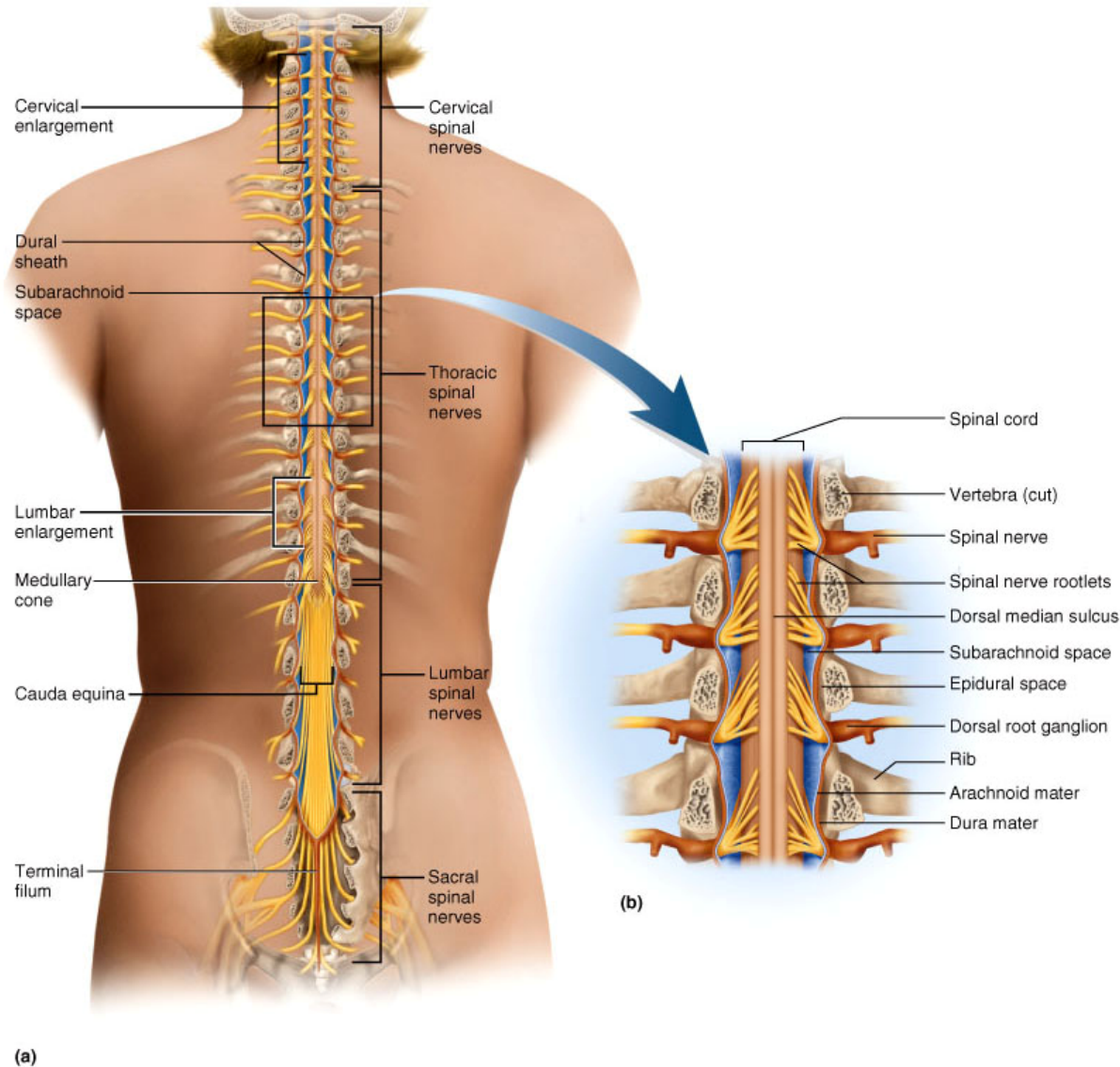


Spinal Cord, Spinal Nerves & Projection Tracts

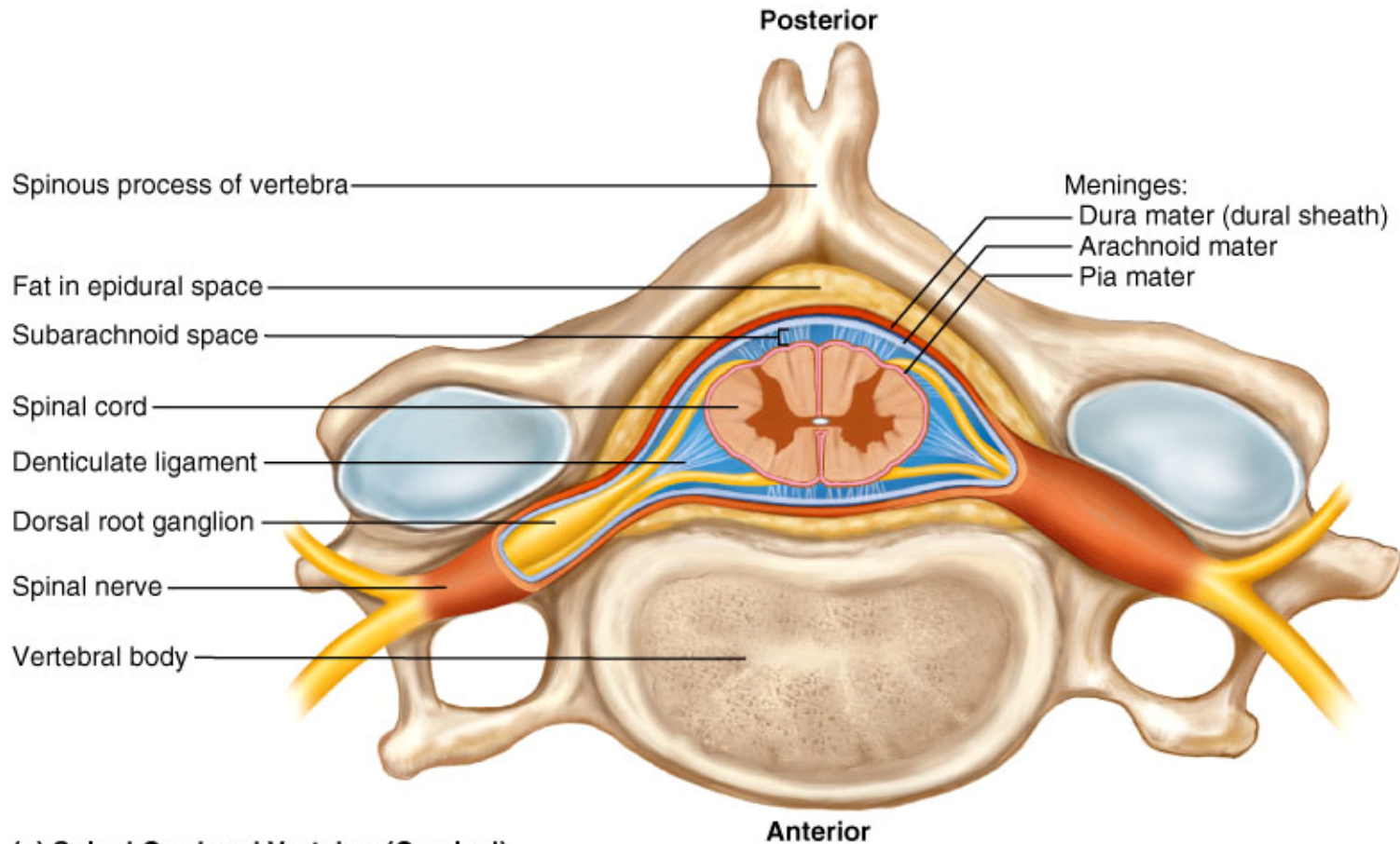
Gross Anatomy of Lower Spinal Cord

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Meninges of Vertebra and Spinal Cord

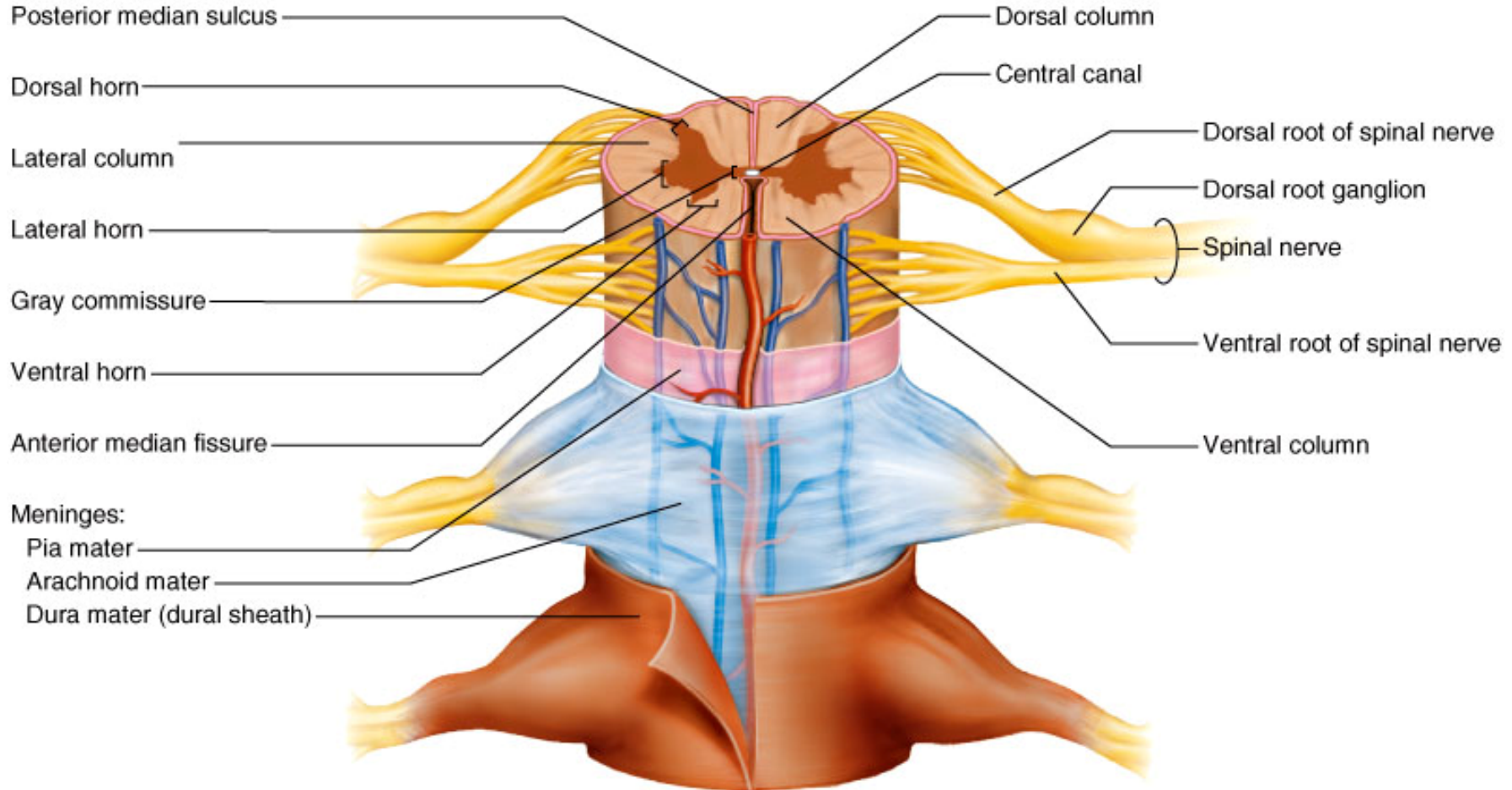
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(a) Spinal Cord and Vertebra (Cervical)

Cross-Sectional Anatomy of the Spinal Cord

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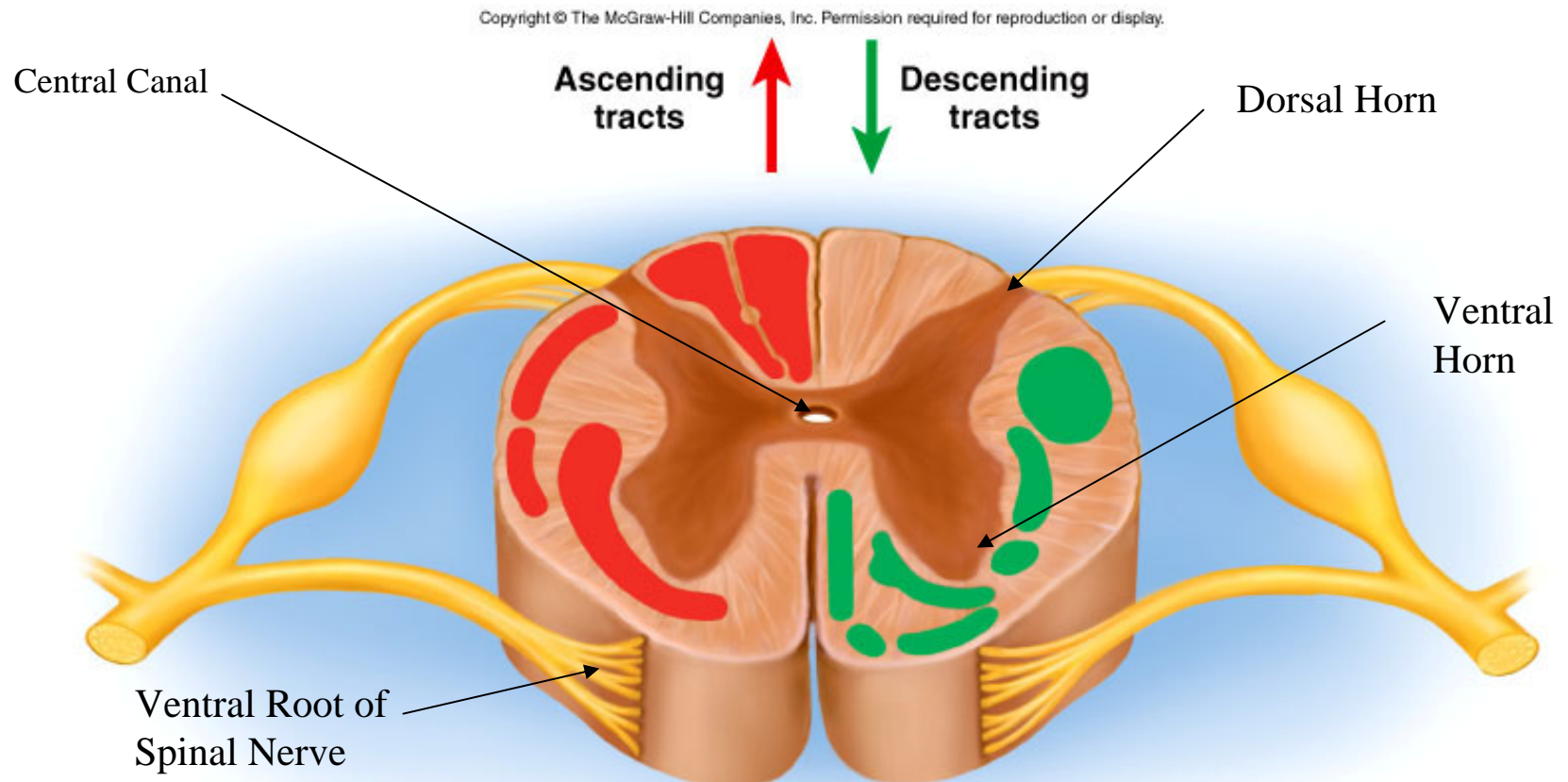


(b) Spinal Cord and Meninges (Thoracic)

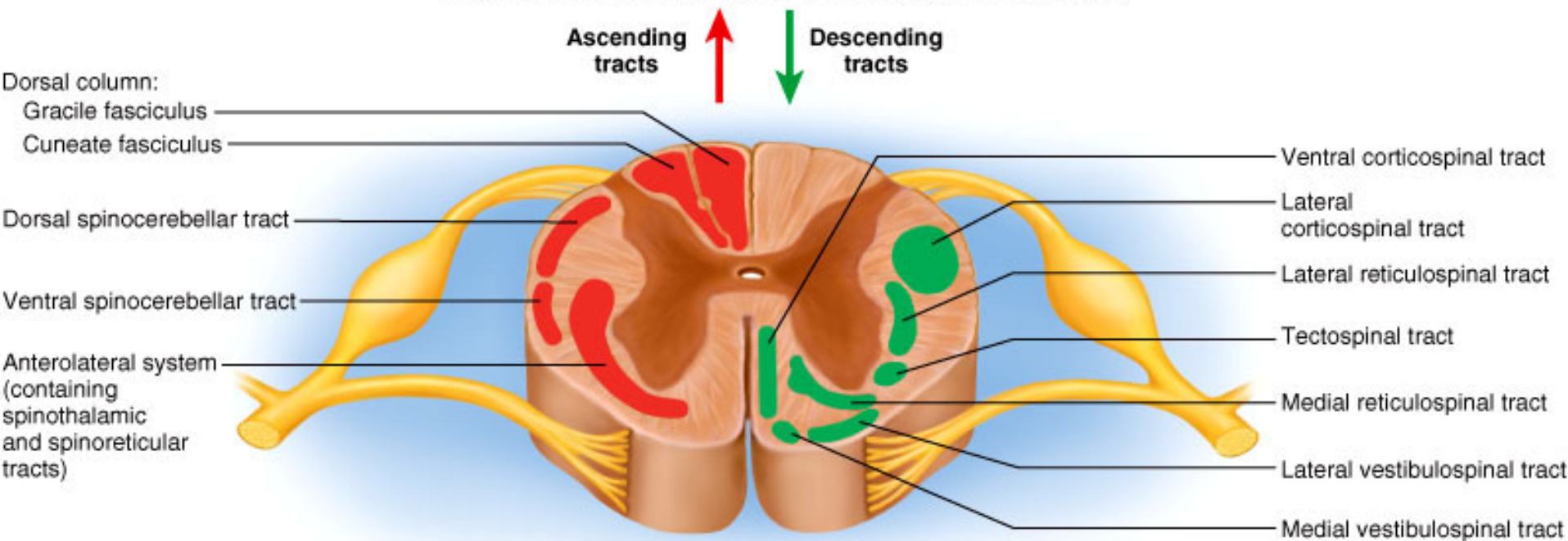
- Central area of gray matter shaped like a butterfly and surrounded by white matter in 3 columns
- Gray matter = neuron cell bodies with little myelin
- White matter = myelinated axons

Gray Matter in the Spinal Cord

- **Pair of dorsal or posterior horns**
 - dorsal root of spinal nerve is totally sensory fibers
- **Pair of ventral or anterior horns**
 - ventral root of spinal nerve is totally motor fibers
- **Connected by gray commissure punctured by a central canal continuous above with 4th ventricle**



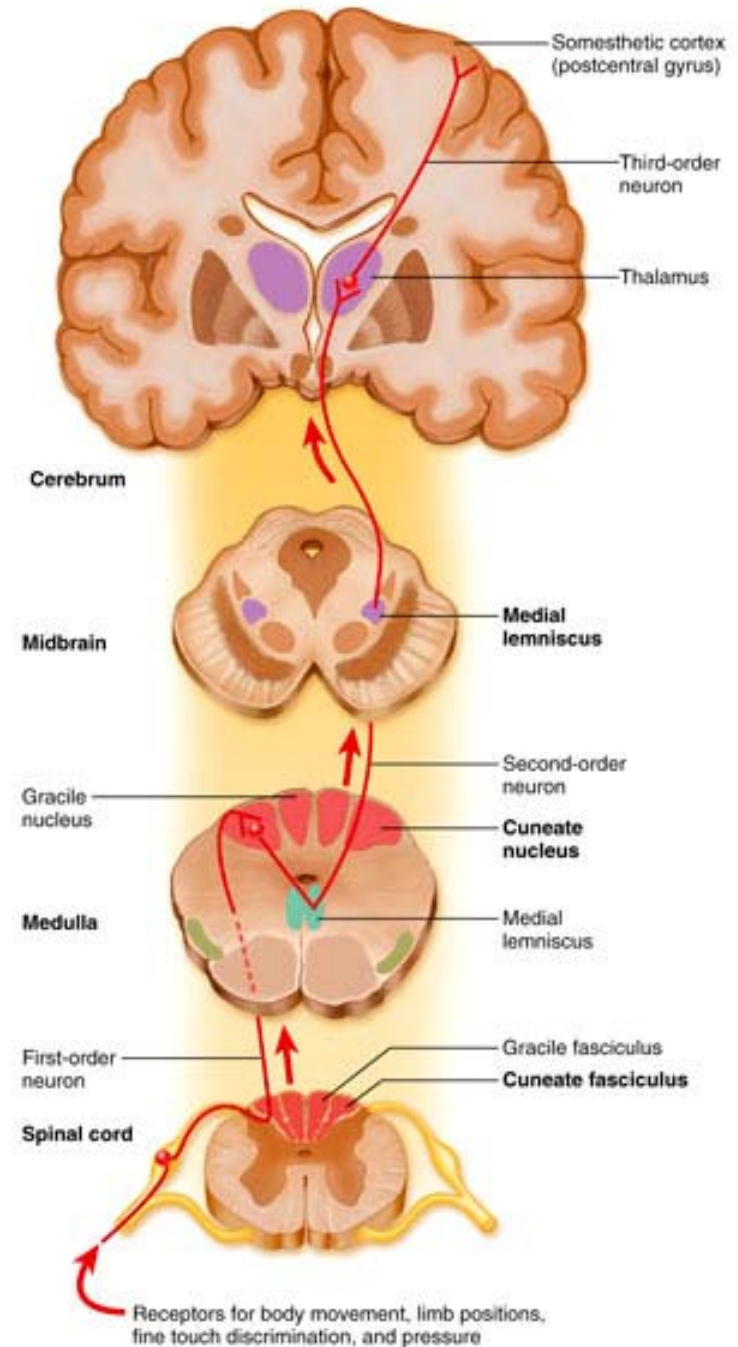
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- **Ascending and descending tract head up or down while decussation means that the fibers cross sides**
- **Contralateral means origin and destination are on opposite sides while ipsilateral means on same side**

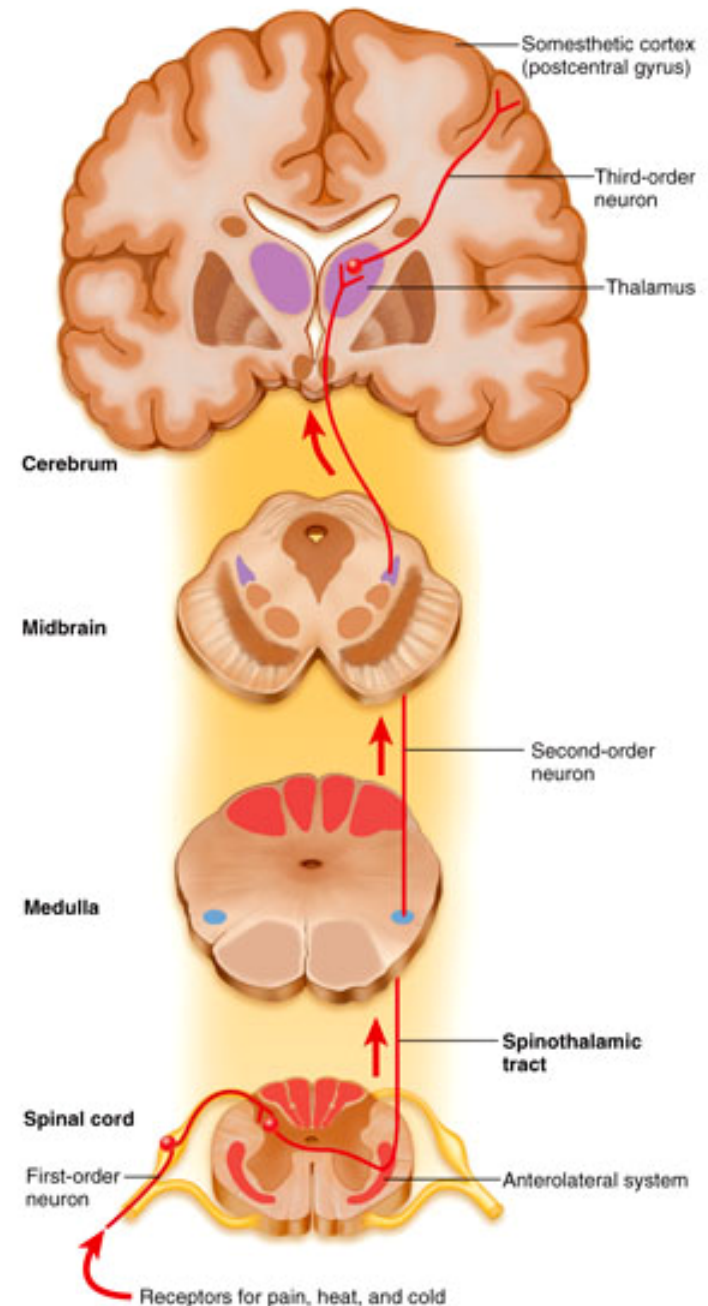
Dorsal Column Ascending Pathway

- **Deep touch, visceral pain, vibration, and proprioception**
- **Fasciculus gracilis and cuneatus carry signals from arm and leg**
- **Decussation of 2nd order neuron in medulla**
- **3rd order neuron in thalamus carries signal to cerebral cortex**



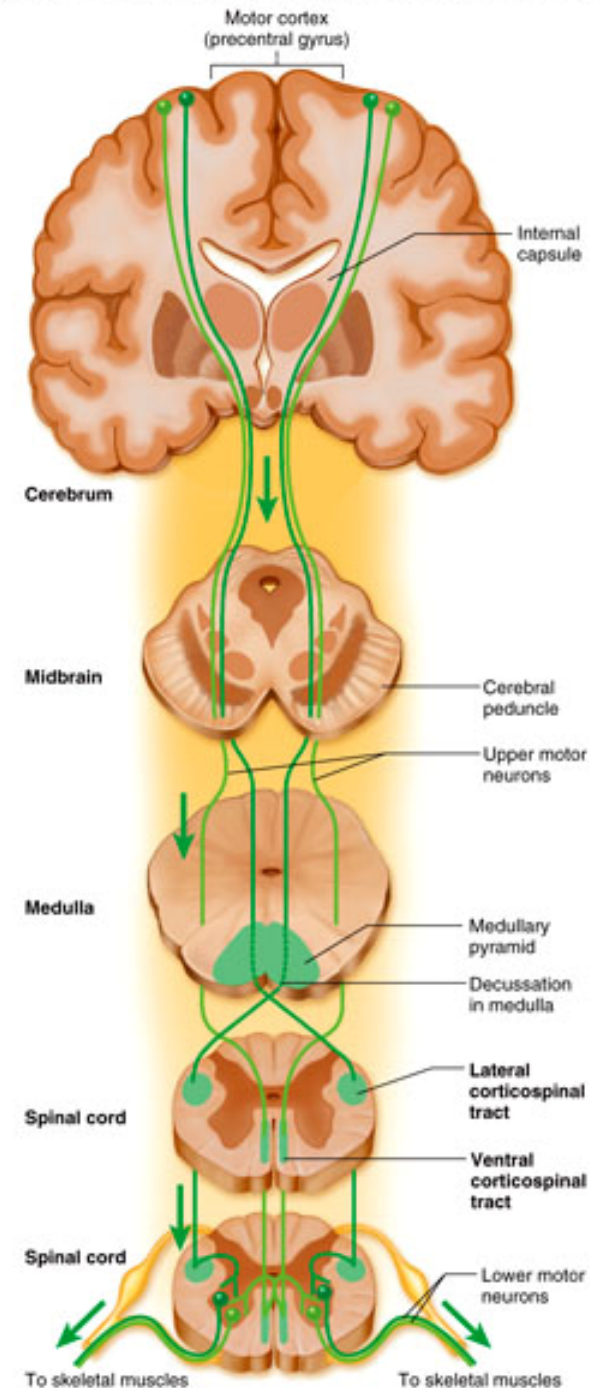
Spinothalamic Pathway

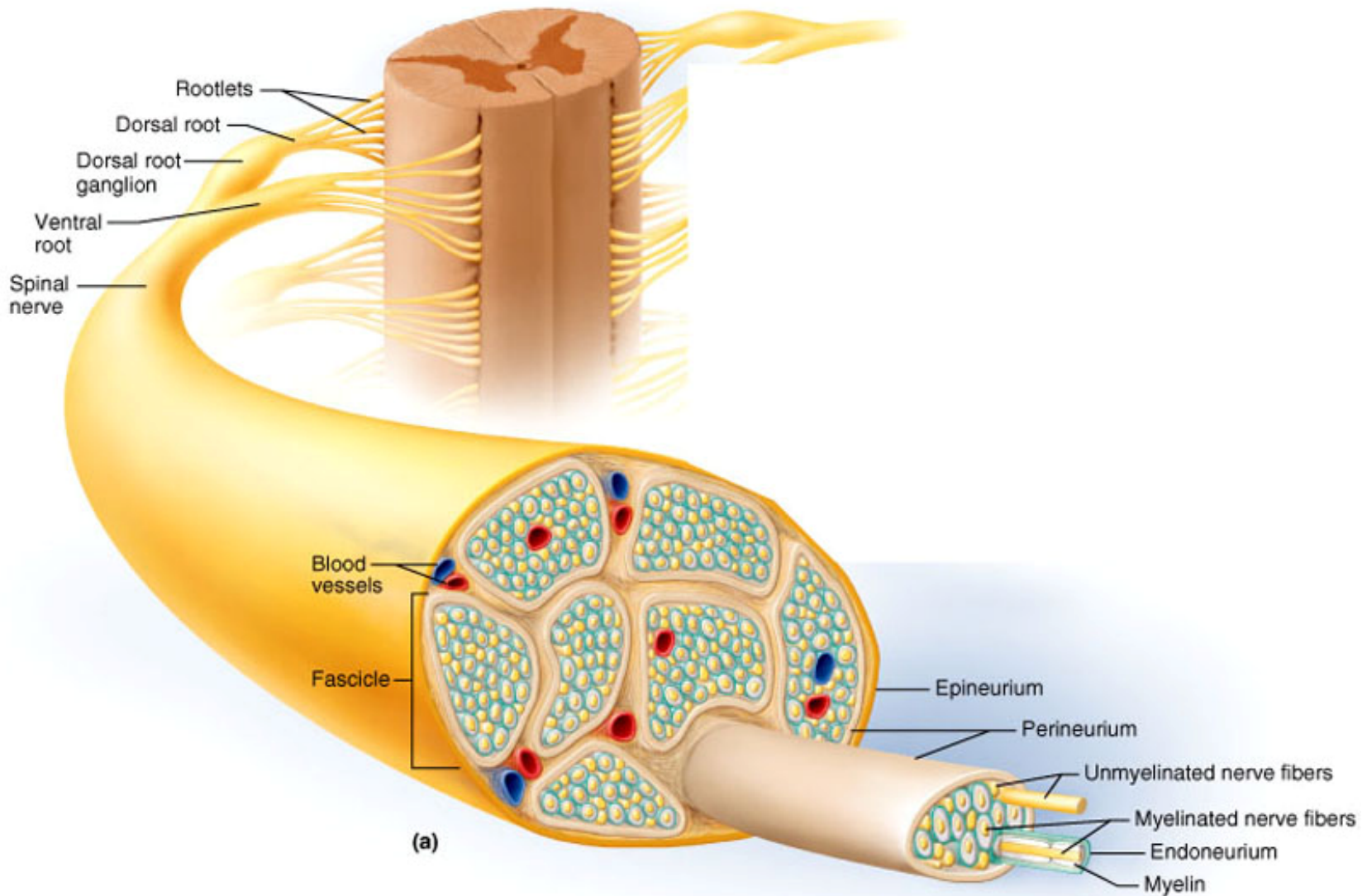
- Pain, pressure, temperature, light touch, tickle and itch
- Decussation of the second order neuron occurs in spinal cord
- Third order neurons arise in thalamus and continue to cerebral cortex



Corticospinal Tract

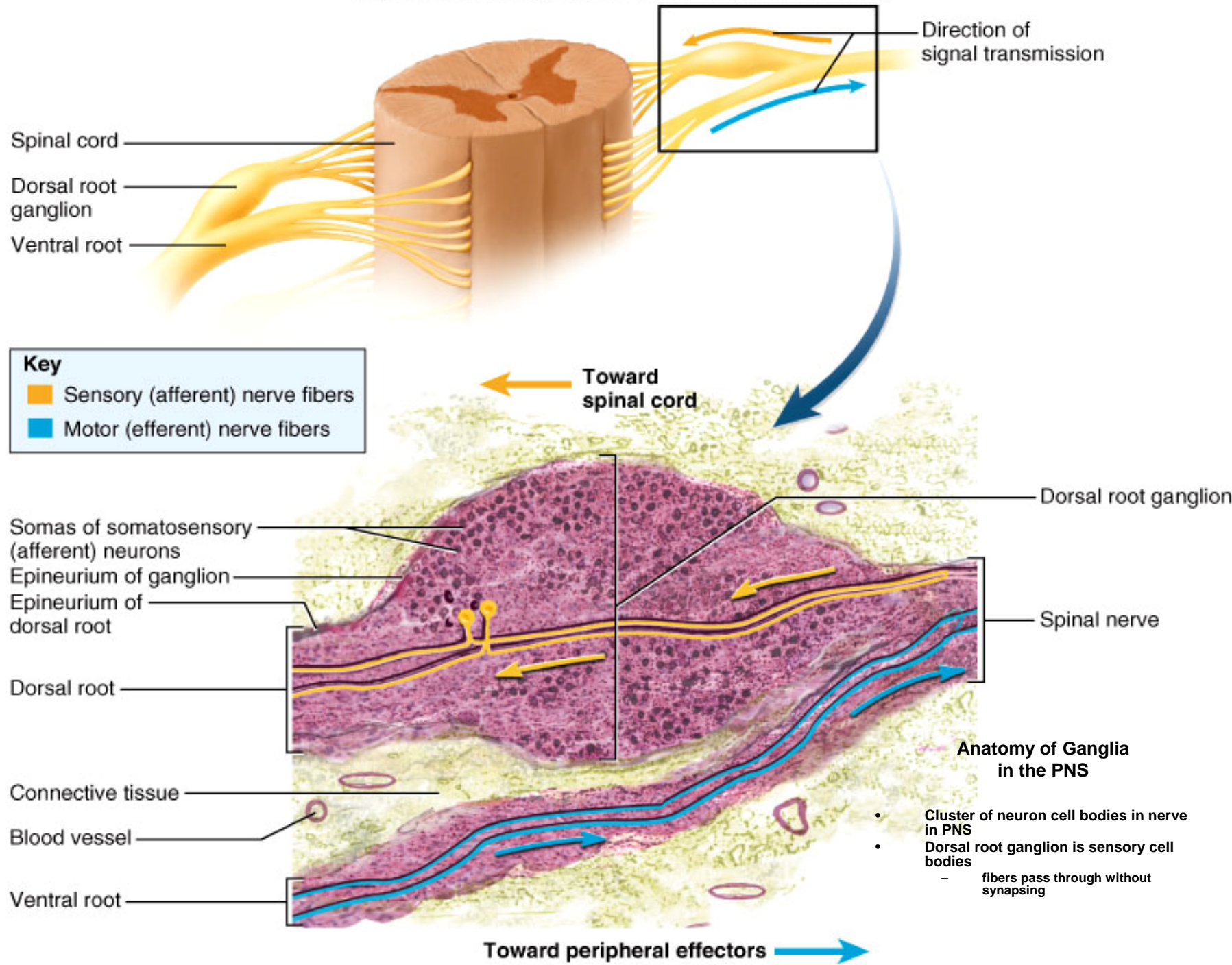
- **Precise, coordinated limb movements**
- **Two neuron pathway**
 - upper motor neuron in cerebral cortex
 - lower motor neuron in spinal cord
- **Decussation in medulla**



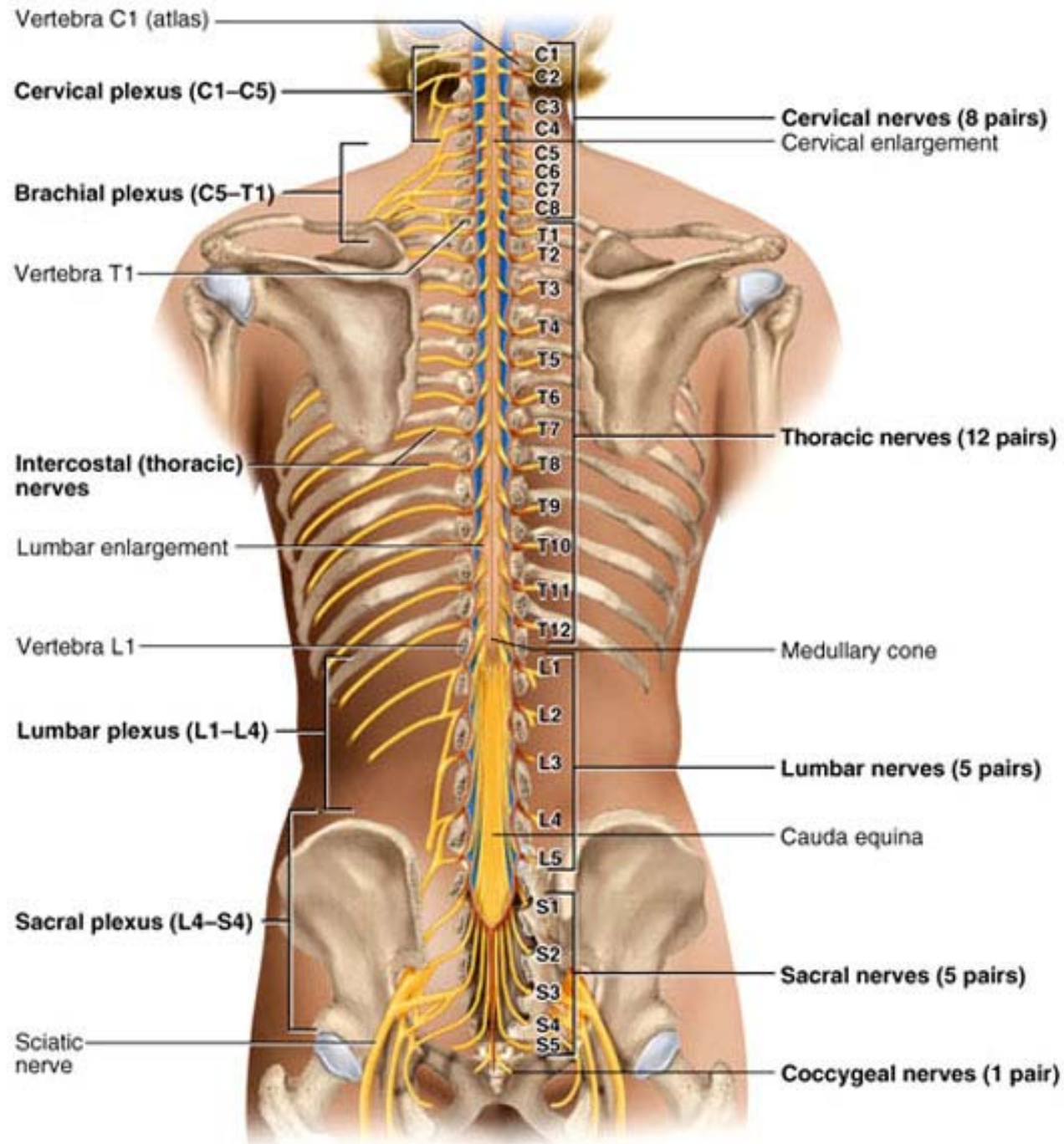


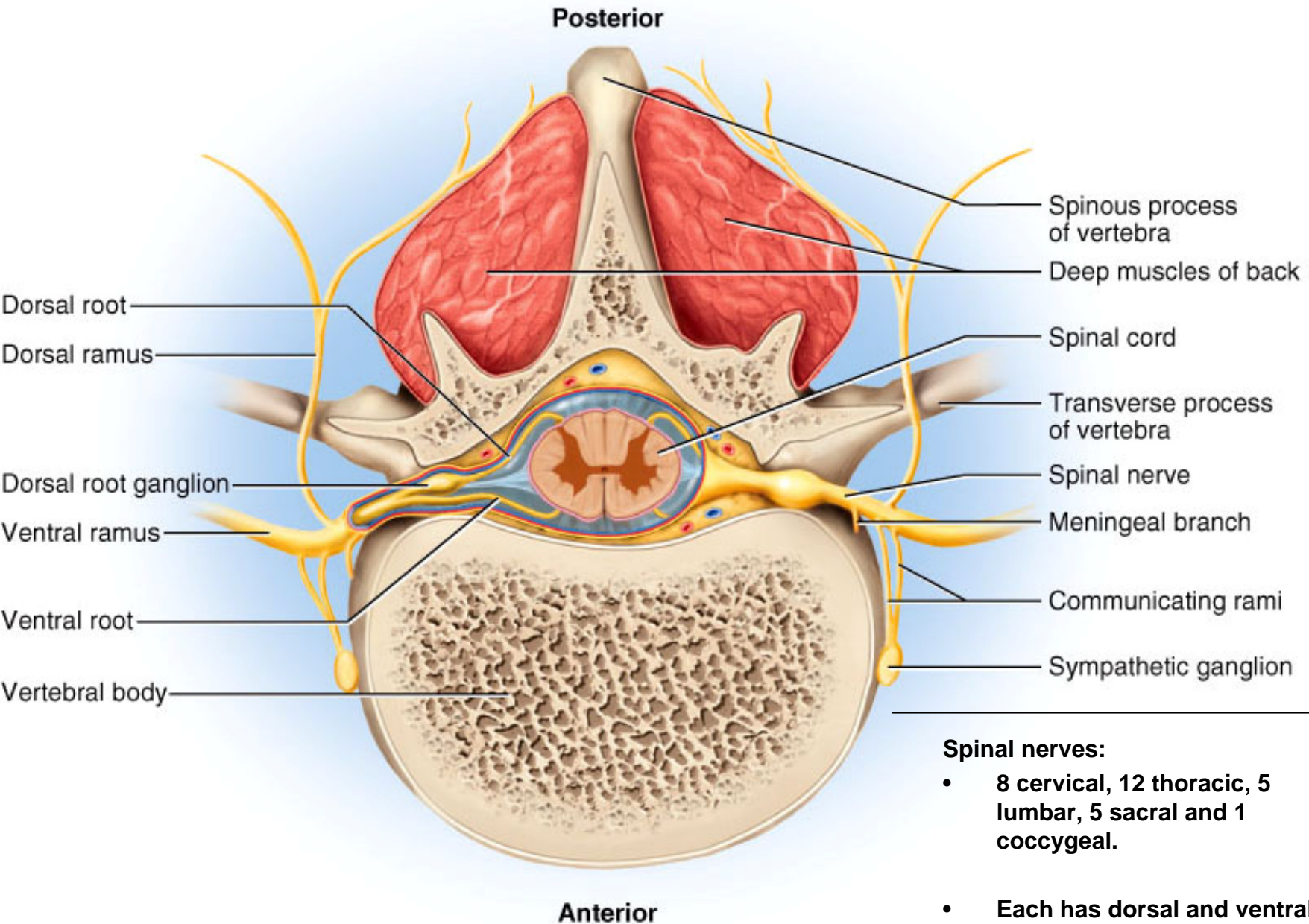
Anatomy of a Nerve

- A nerve is a bundle of nerve fibers (axons)
- Epineurium covers nerves, perineurium surrounds a fascicle and endoneurium separates individual nerve fibers
- Blood vessels penetrate only to the perineurium



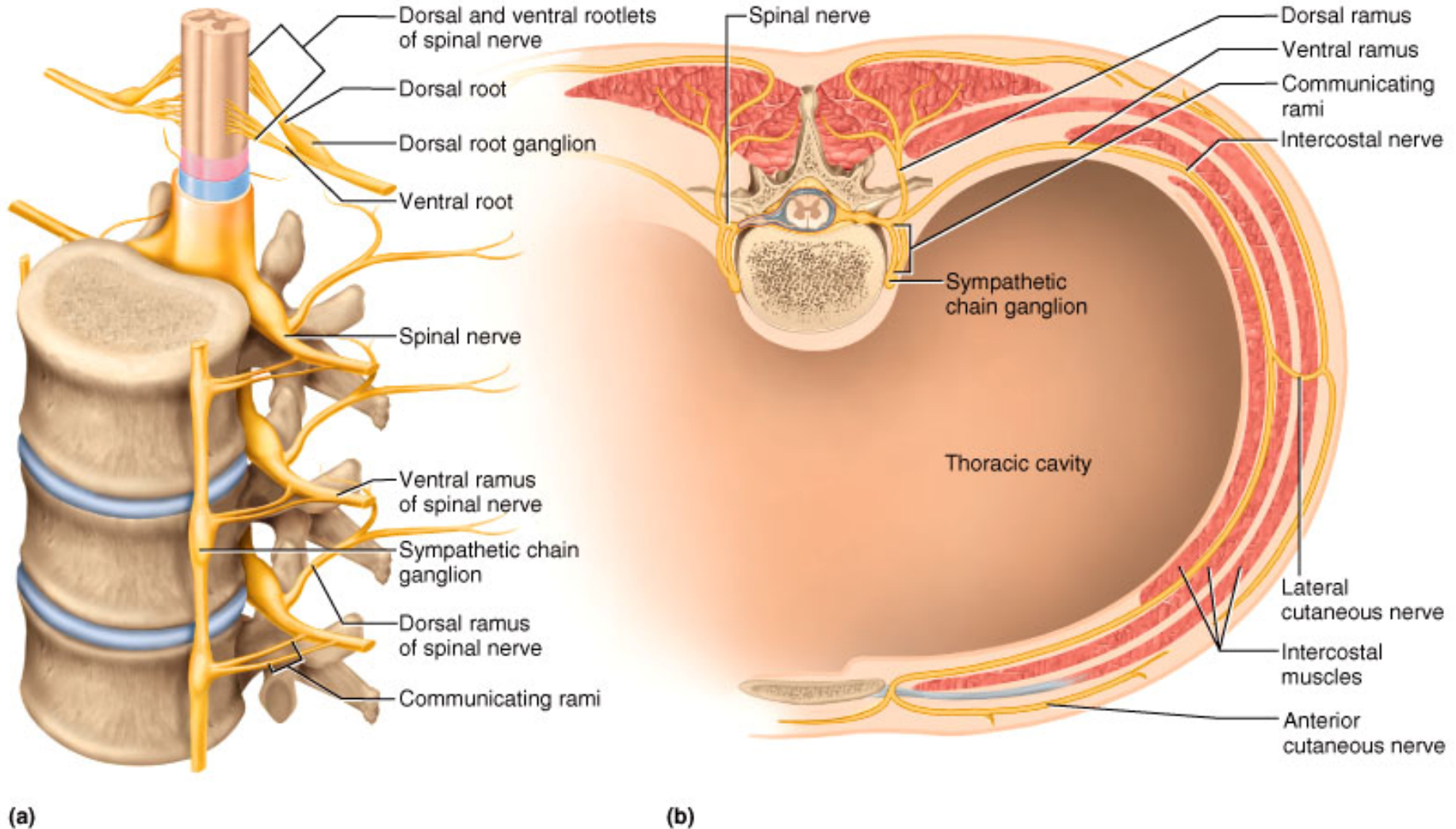
Spinal Nerve Roots and Plexuses



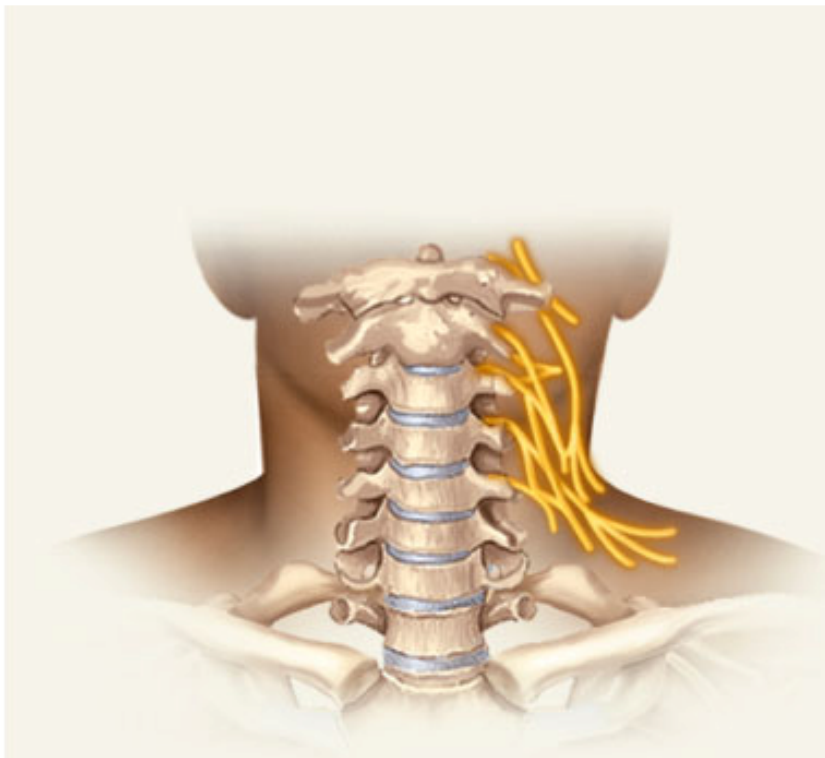


Rami of Spinal Nerves

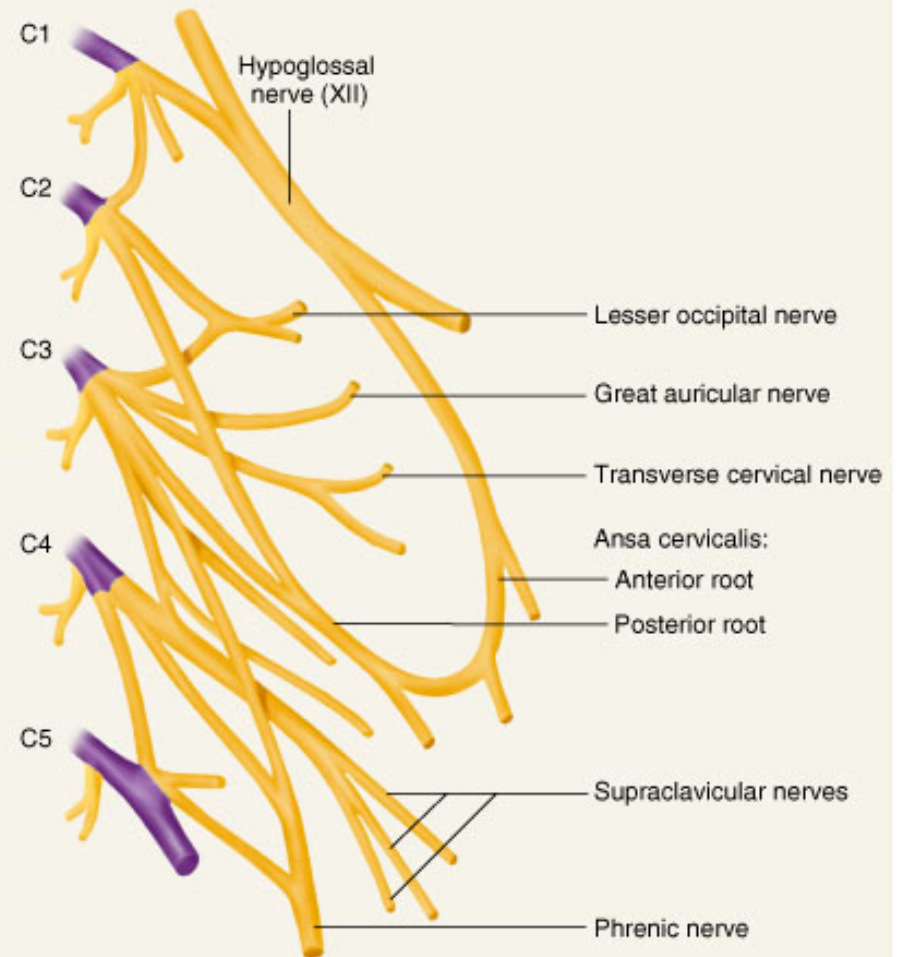
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- Notice the branching and merging of nerves in this example of a plexus



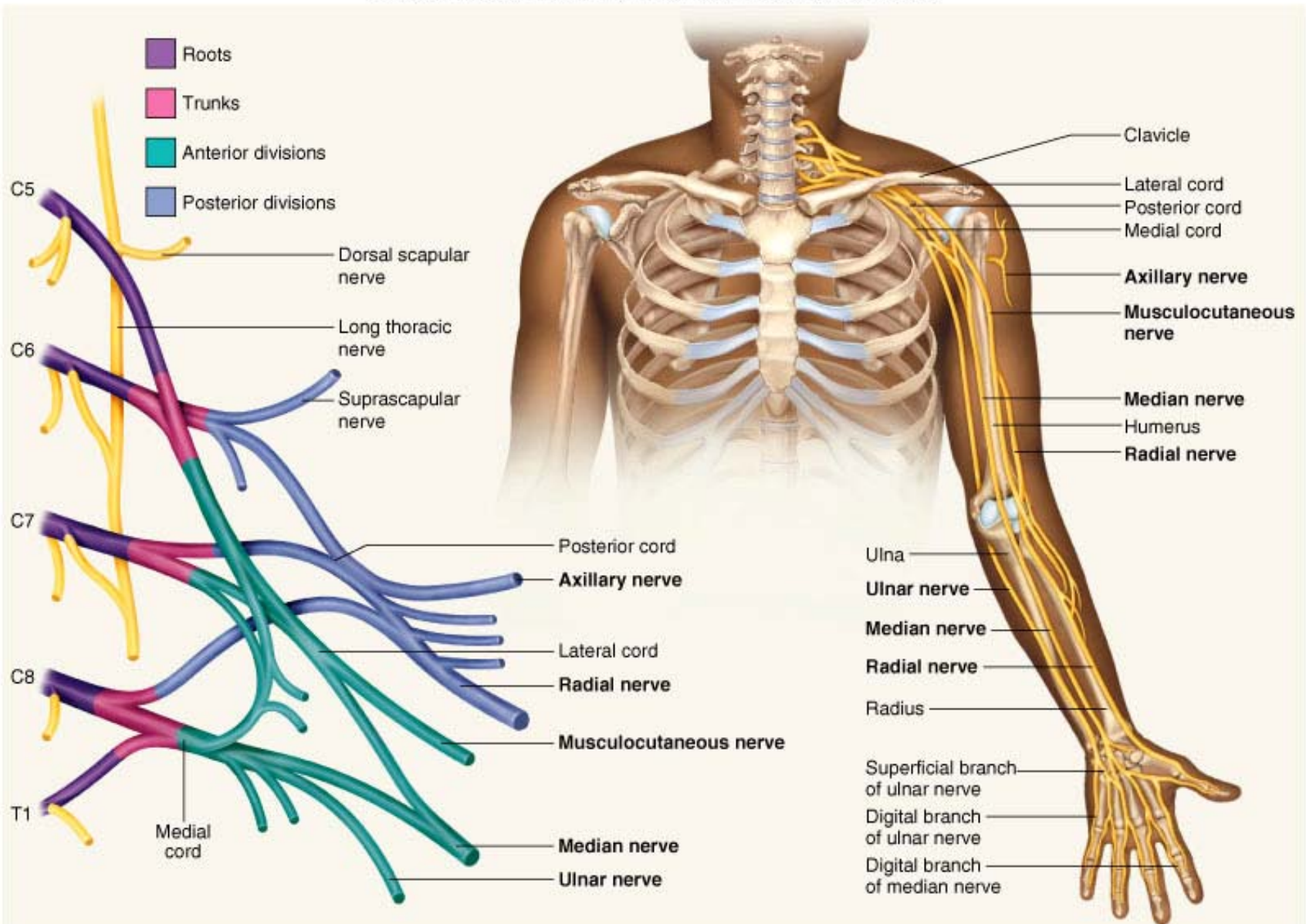
Roots



The Cervical Plexus

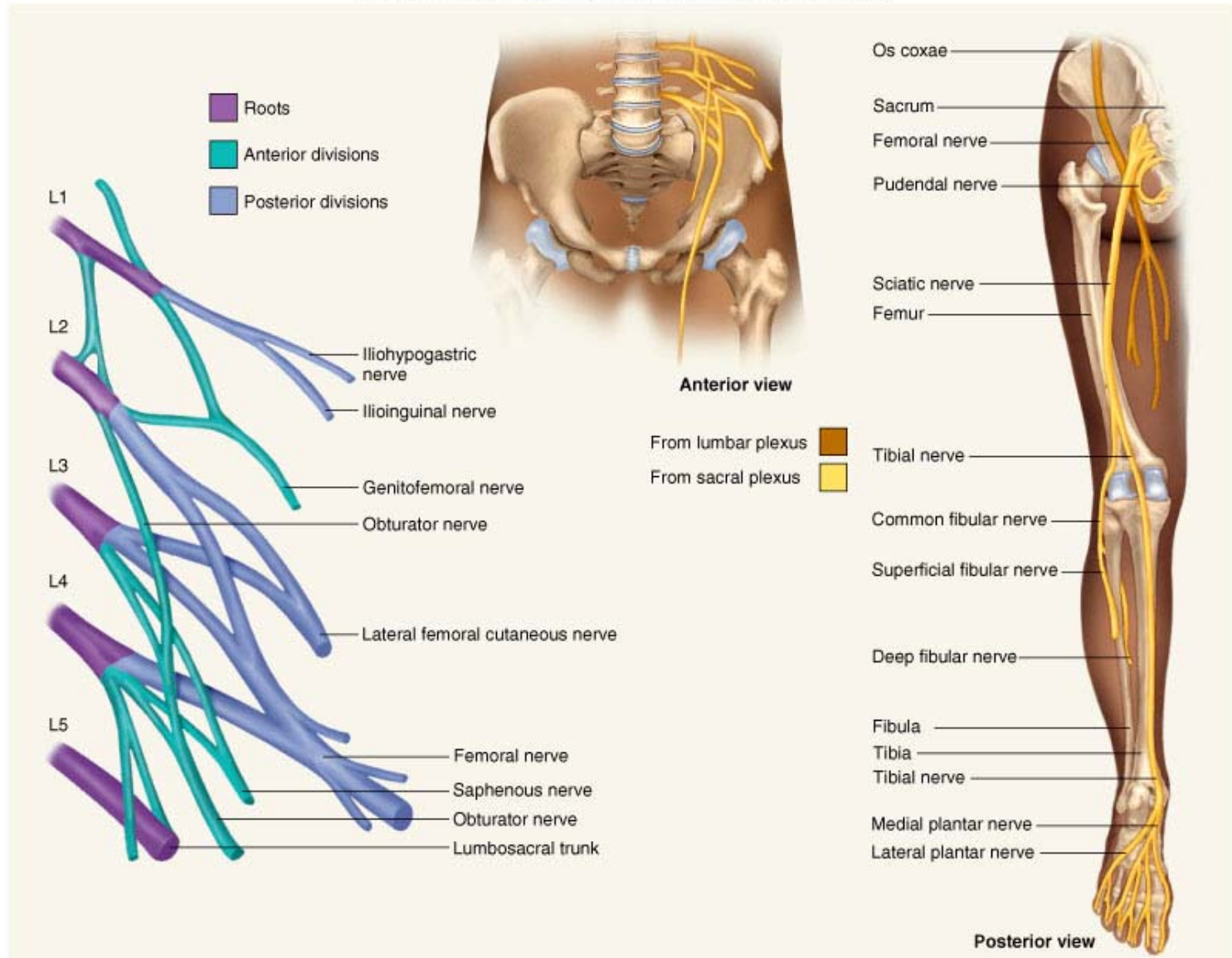
The Brachial Plexus

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The Lumbar Plexus

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The Sacral and Coccygeal Plexuses

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