Somatosensory pathways
L6

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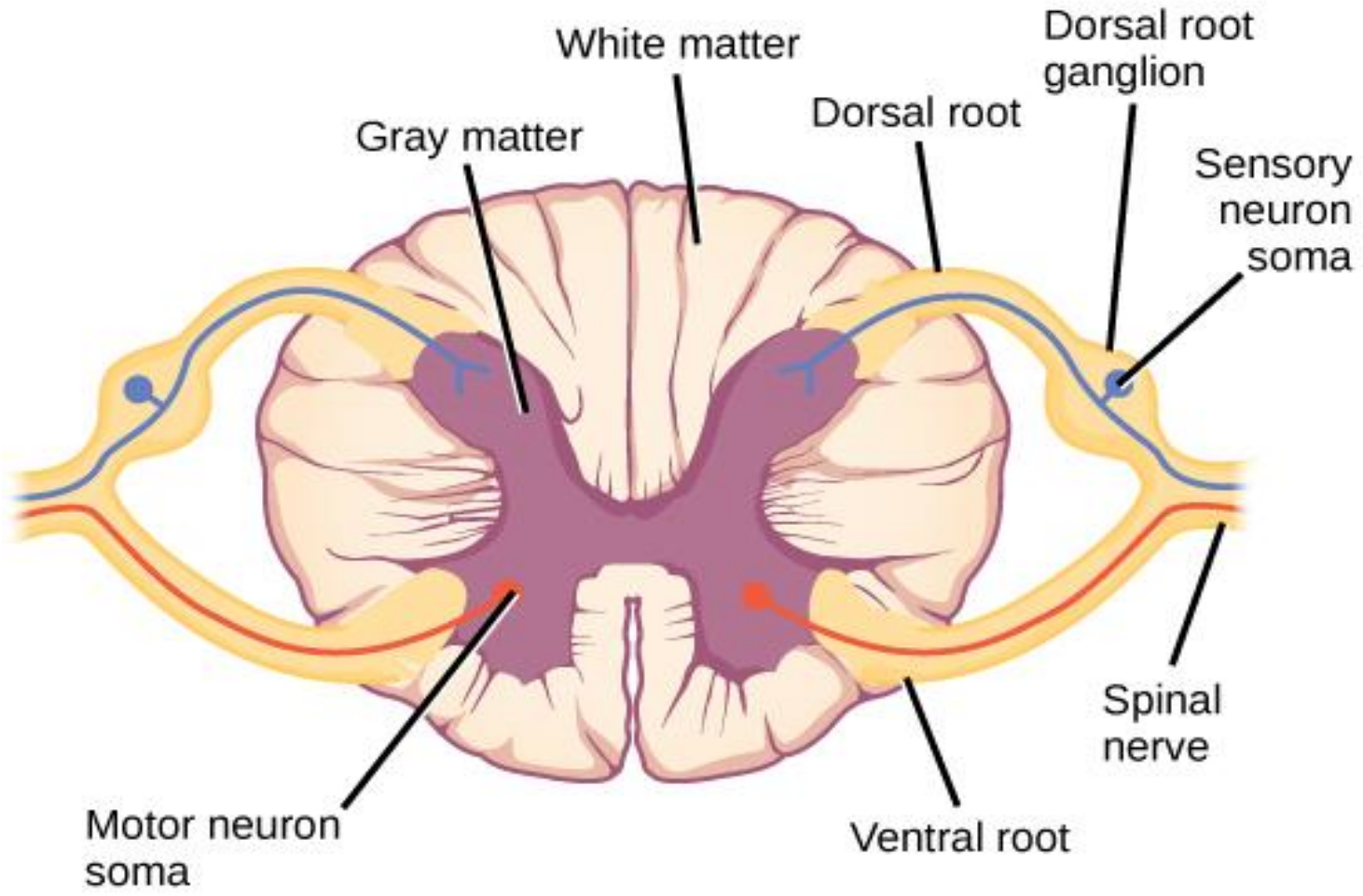
objectives

- Pathway for transmission of sensory signals
- Details about Dorsal column pathway
- Posterior cord syndrome.

SENSORY PATHWAYS FOR TRANSMITTING SOMATIC SIGNALS INTO THE CENTRAL NERVOUS SYSTEM



Cross Section of Spinal Cord

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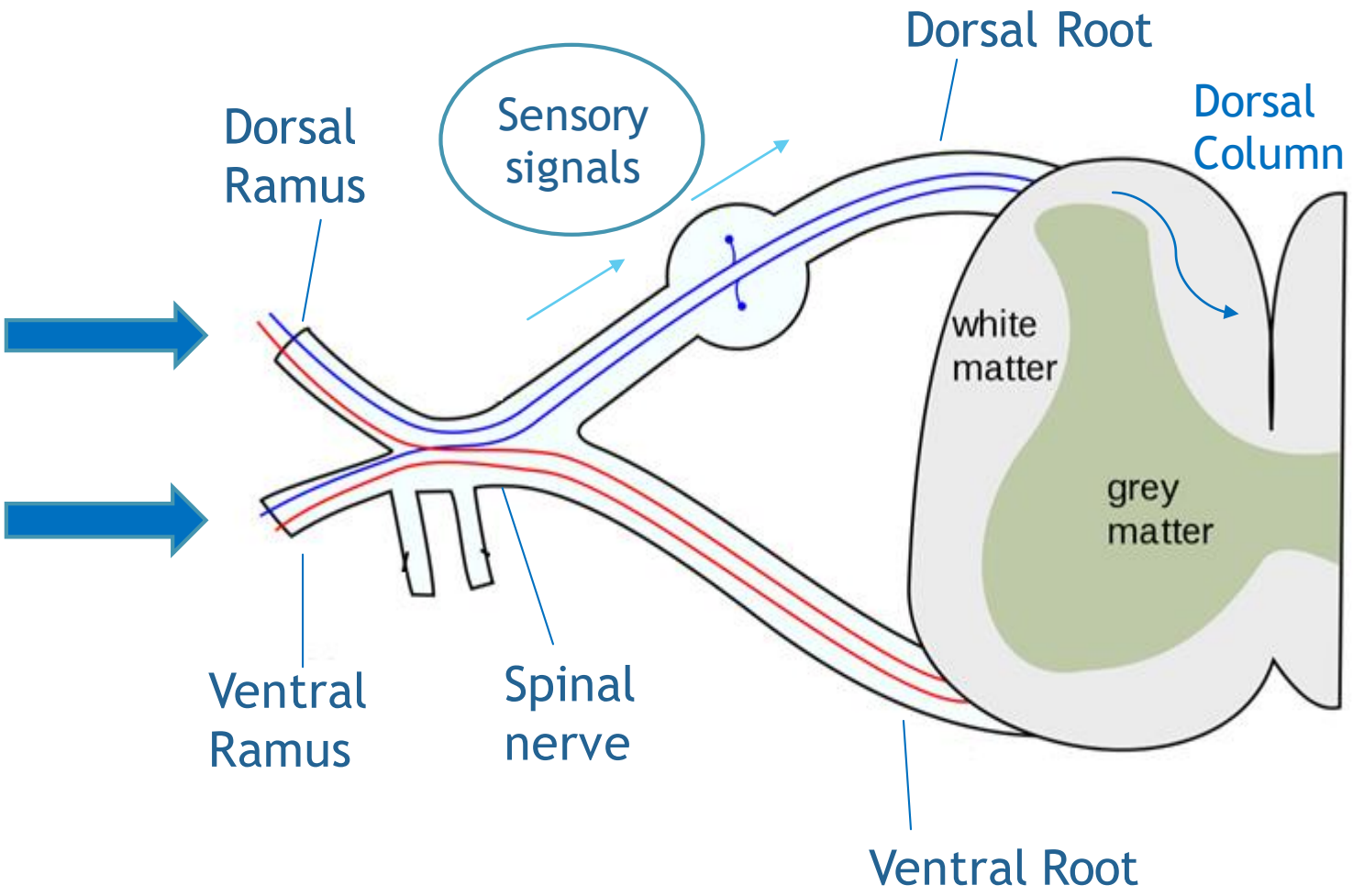

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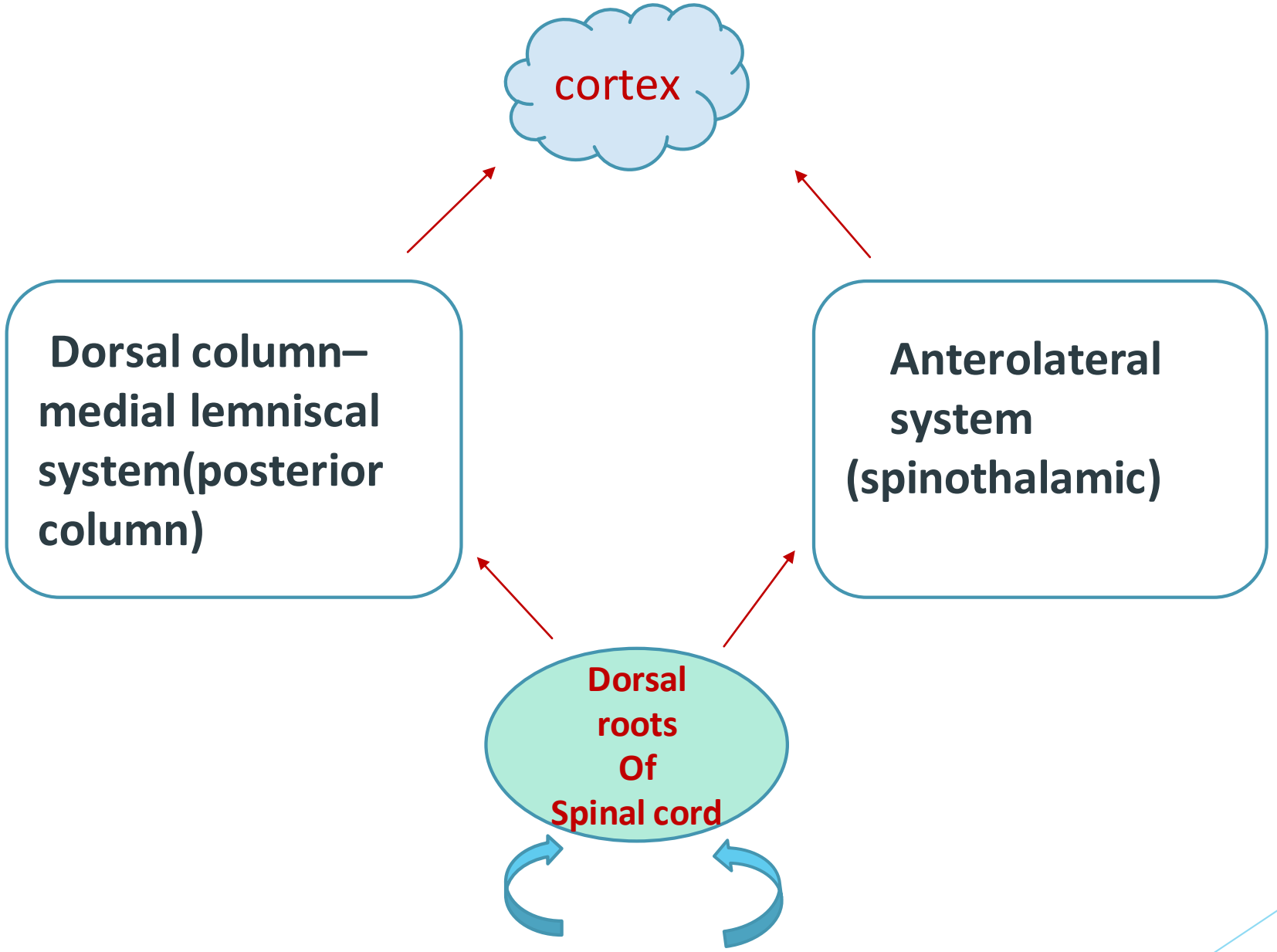
The Relay Station for sensory information within the spinal cord is

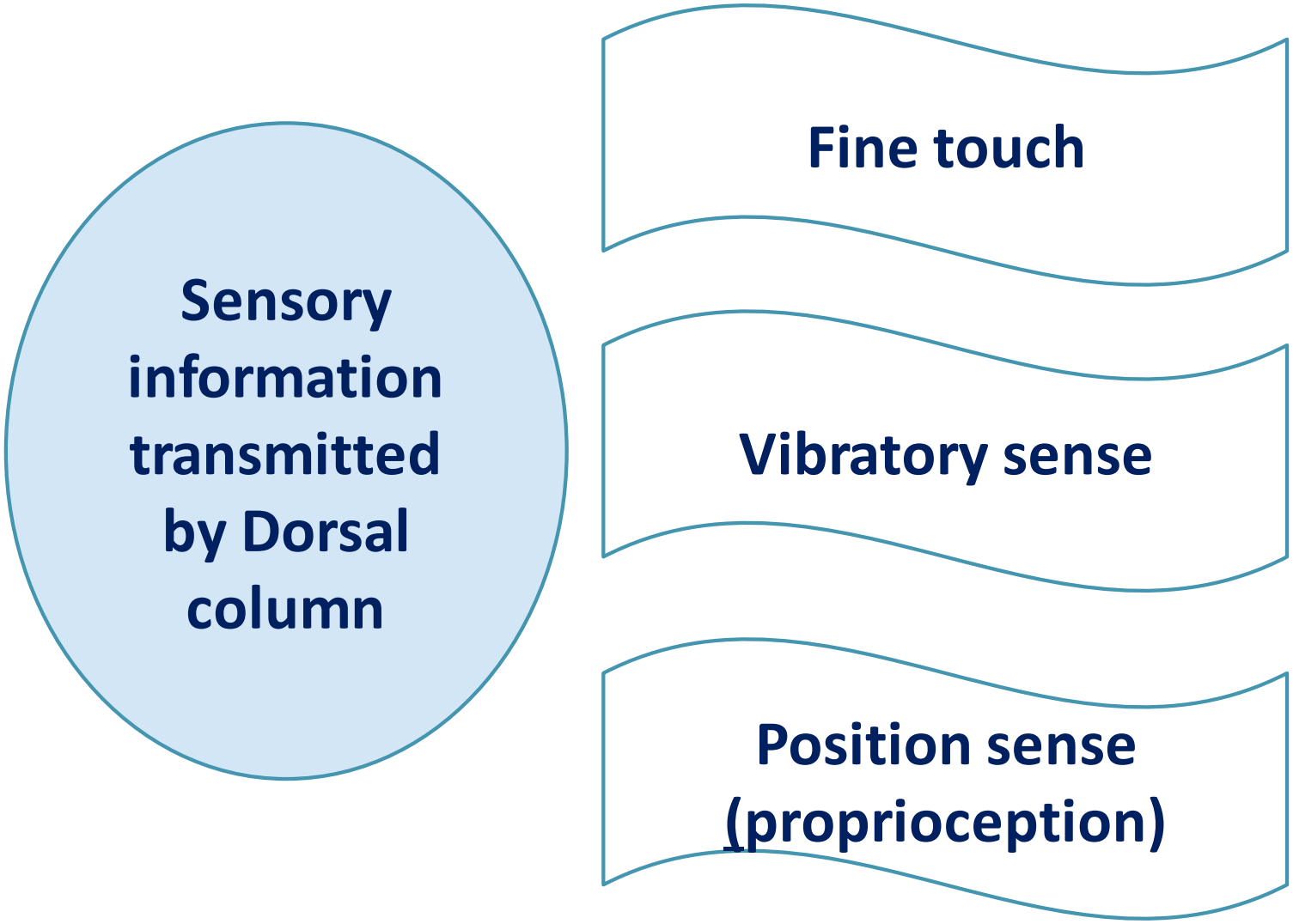
Dorsal Root


cortex
Dorsal column–medial lemniscal system(posterior column)
Anterolateral system (spinothalamic)
Dorsal roots Of Spinal cord
Sensory information

1. **Dorsal Column Medial Lamniscal system**

- Its name arises from the two major structures that comprise the DCML.
- In the spinal cord, information travels via the **dorsal (posterior) columns**
- In the brainstem, it is transmitted through the **medial lemniscus.**

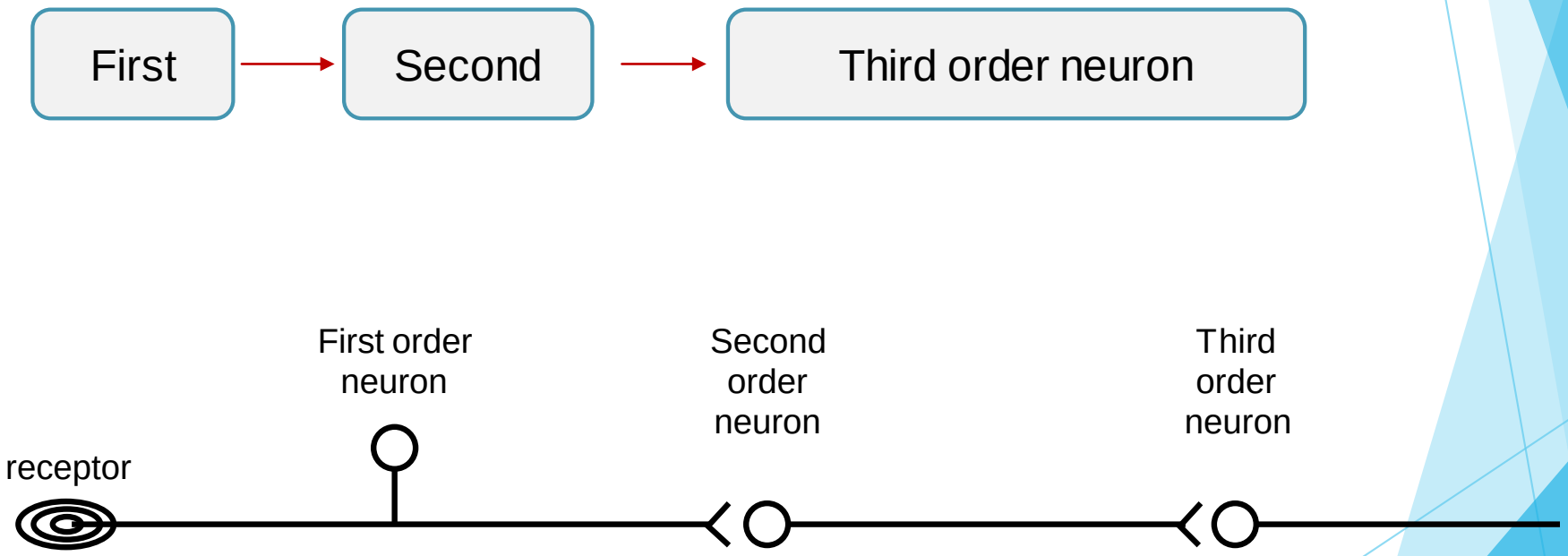
Types of sensory inputs transmitted by dorsal column



How sensory signals transmitted in the posterior column pathway?

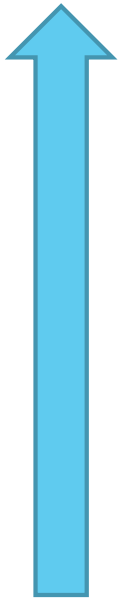
How the sensory information ascend up?

Dorsal Column-Medial Lemniscus system



First Order Neurons

Medulla Oblongata



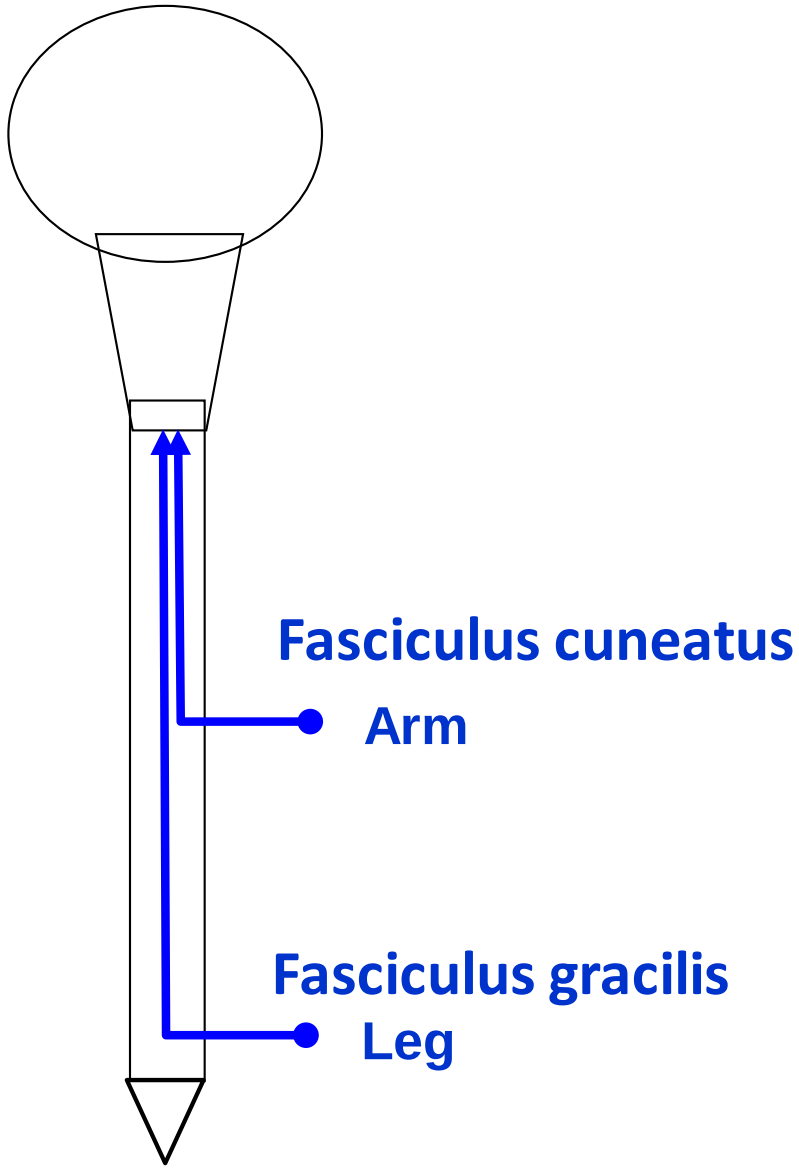
Spinal cord

- **Signals from the upper limb** : travel in the fasciculus cuneatus (the lateral part of the dorsal column). They then synapse in the nucleus cuneatus of the medulla oblongata.

- **Signals from the lower limb**: travel in the fasciculus gracilis (the medial part of the dorsal column). They then synapse in the nucleus gracilis of the medulla oblongata.

Medulla Oblongata

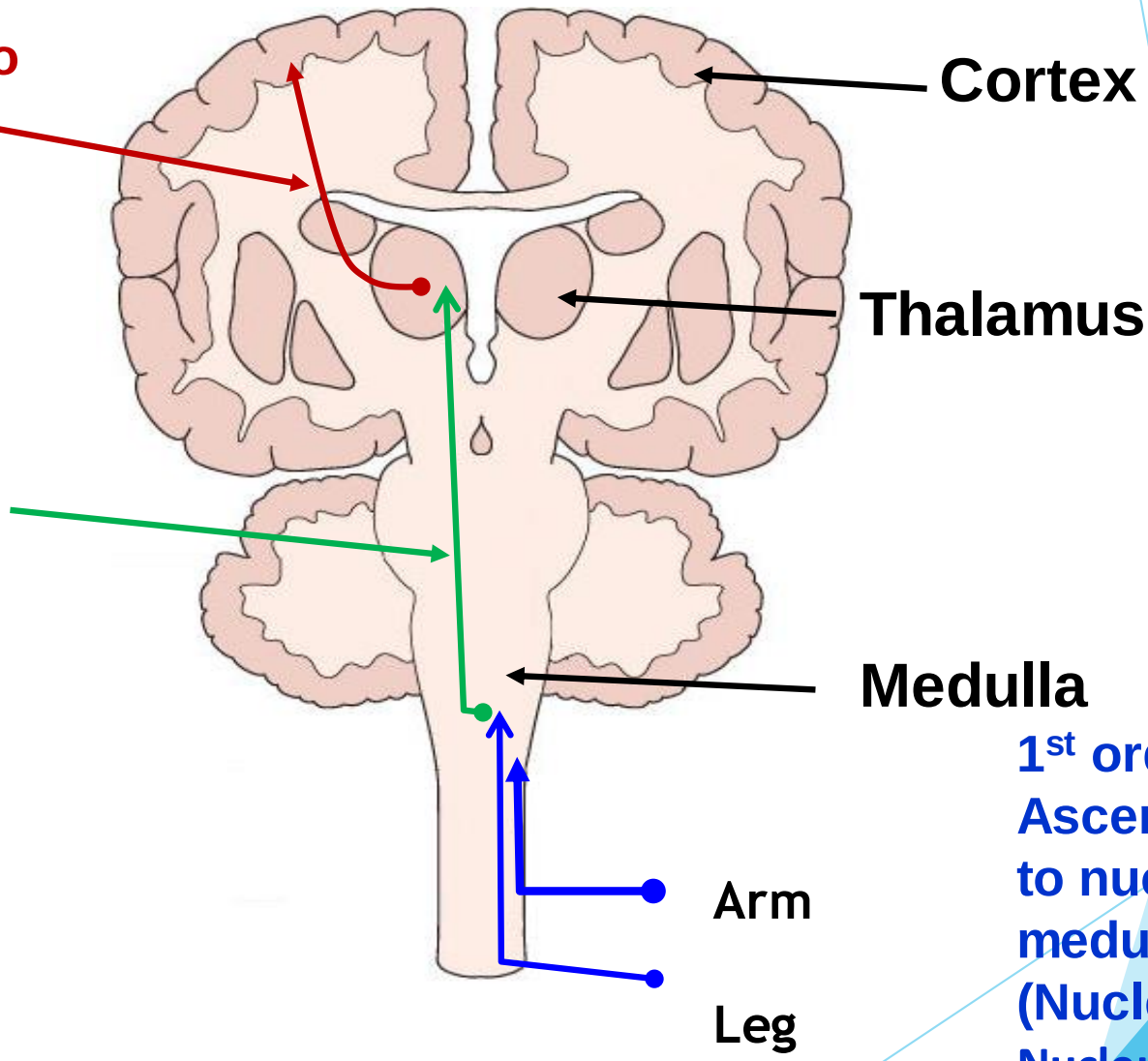
Spinal cord



Dorsal column

3rd order neurons from the thalamus ascend to cortex via internal capsule

2nd order neurons Decussate and ascend to thalamus via medial lemniscus



1st order neurons Ascend ipsilaterally to nuclei in the medulla (Nucleus cuneatus or Nucleus gracilis)

Posterior Cord Syndrome

- It is one of the Spinal cord pathologies which involve dorsal column (posterior cord)
- It occurs when the damage is towards the back of the spinal cord.
- It can result from a car accident, slips and falls.

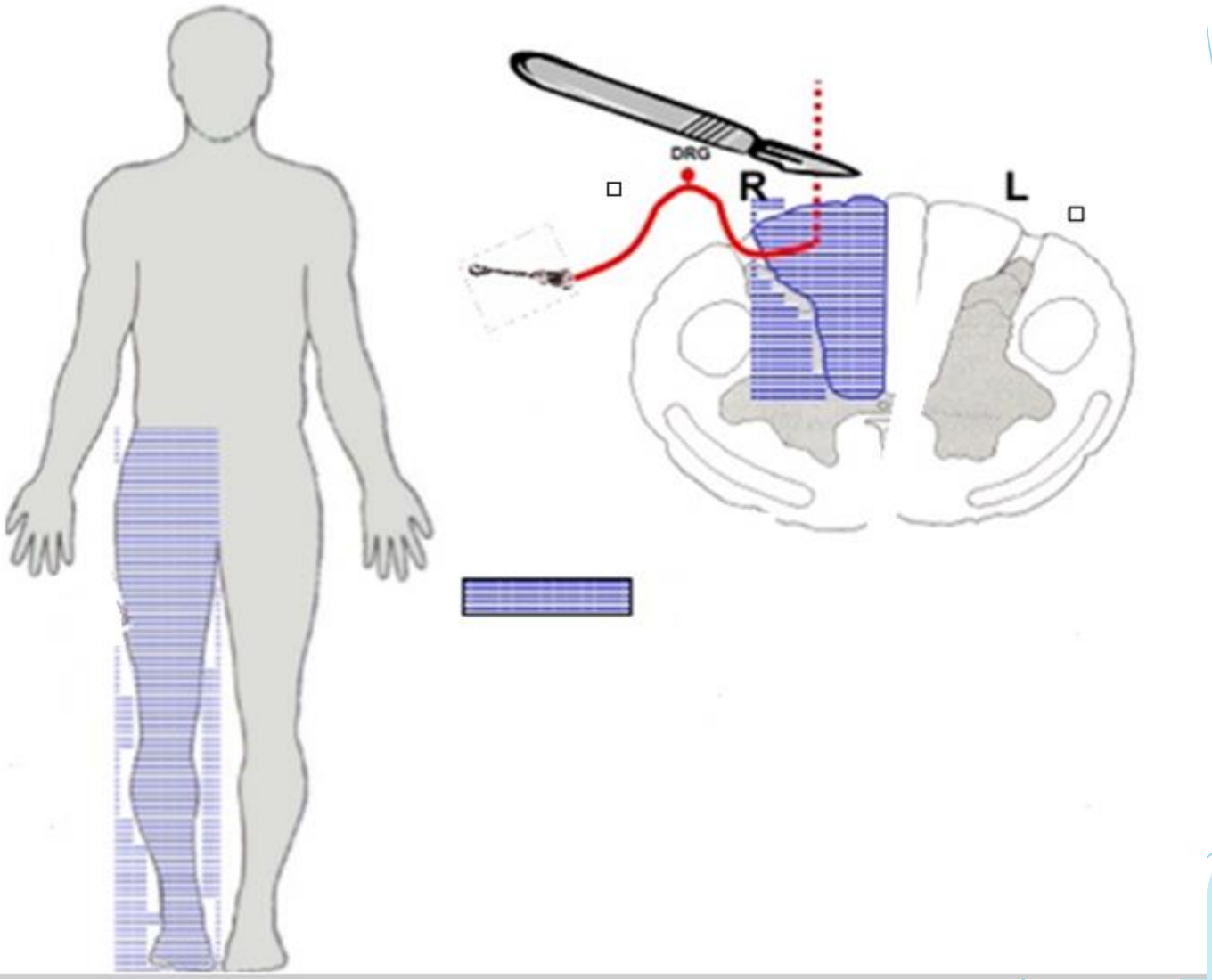
Symptoms

1. Ipsilateral loss of fine touch, vibration and proprioception.

2. The sensations of pain and temperature are retained.

3. Unusual sensations such as a prickling feeling or a burning sensation.

Right posterior cord syndrome



Right side loss of fine touch, vibration and proprioception below the level of the lesion

https://slideplayer.com

Q1/ Name the nerve fiber that transmit sensory signals in dorsal column from the upper limb.

Answer:

Fasiculus cuneatus

Q2/ one of the following senses will be spared in Posterior Cord Syndrome :

a. Vibration
b. Pain senses
c. Position sense
d. Fine touch

Recap

1. Dorsal column pathway transmit fine touch, vibration and position sense.

2. The Relay Station for sensory information within the spinal cord is dorsa root

3. what are the First, second and third order neurons involve in the transmission

4. Signals from the upper limb : travel in the fasciculus cuneatus, Signals from the lower limb: travel in the fasciculus gracilis


thank
you