

 **CNS Module**
Physiology Lectures
(Lecture 2)
Topic 2: Spinal cord & somatic sensations



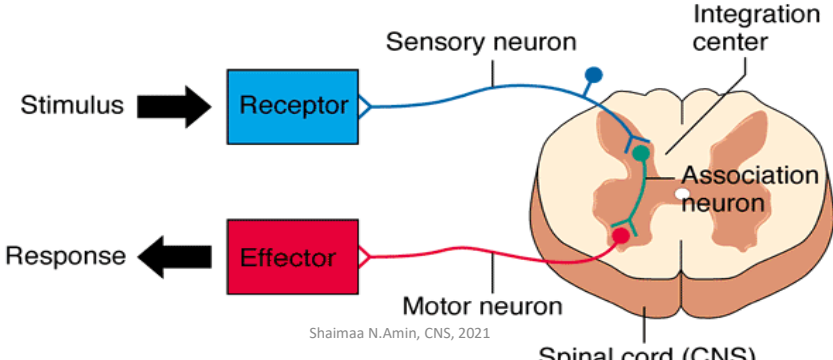
Sensory System

Presented by:
Dr.Shaimaa Nasr Amin
Associate Professor of Medical Physiology

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Sensations & Perceptions

Sensation : is an awareness of sensory stimuli in brain.



Stimulus → Receptor → Sensory neuron → Integration center → Association neuron → Motor neuron → Effector → Response

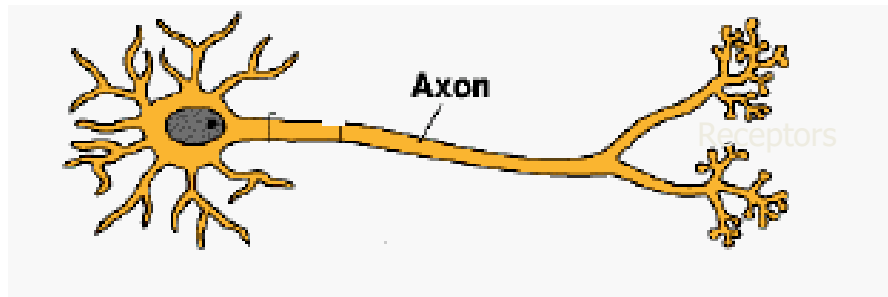
Spinal cord (CNS)

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Sensory receptors

1. Specialized structures **or**
2. modified n. endings at the peripheral termination of afferent fibers.



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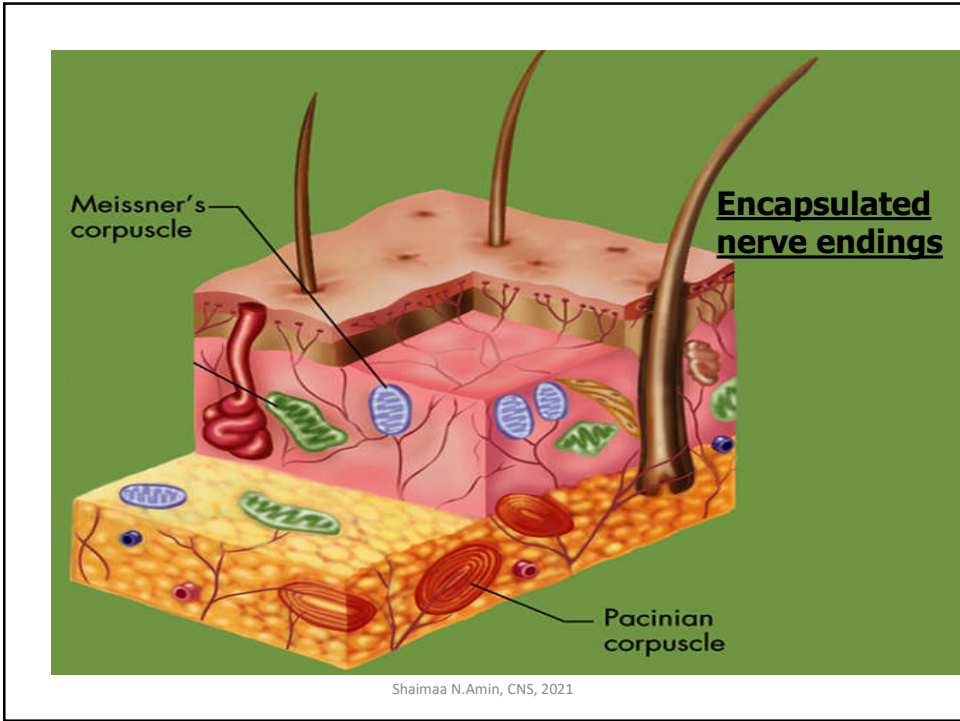
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Classification (by stimulus type)

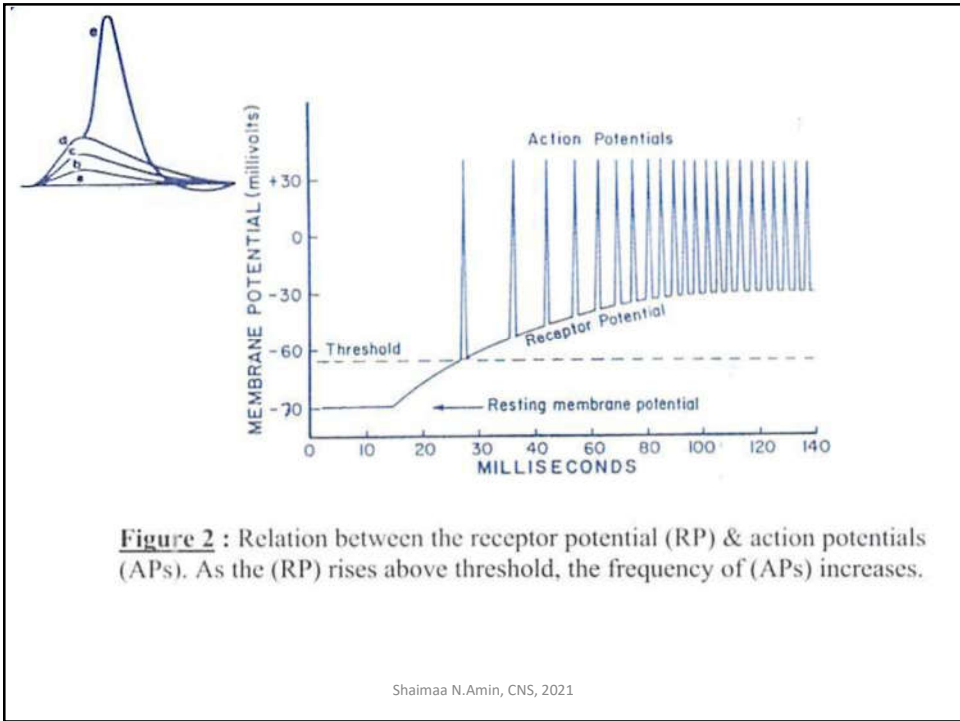
1. Mechanoreceptors
2. Thermoreceptors
3. Pain receptors
4. Electromagnetic receptors
5. Chemoreceptors

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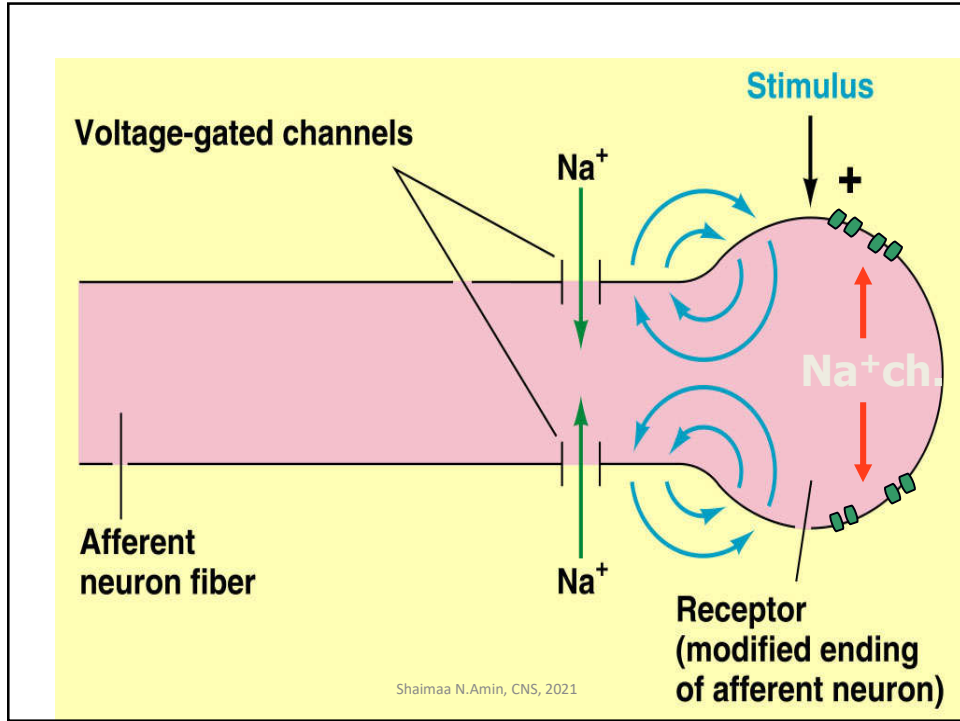
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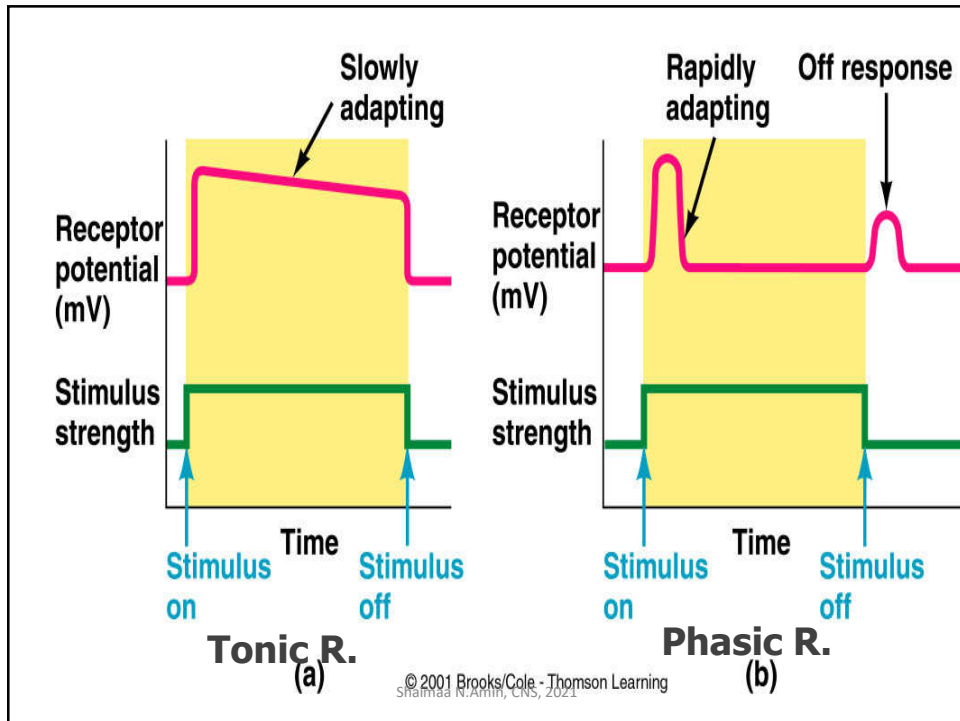
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Coding of sensory information

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Weber-Fechner principle:

This is a logarithmic function which states that: **the perceived sensation is proportional to log intensity of the stimulus.**

$$R = \log S \times K$$

R: perceived sensation .

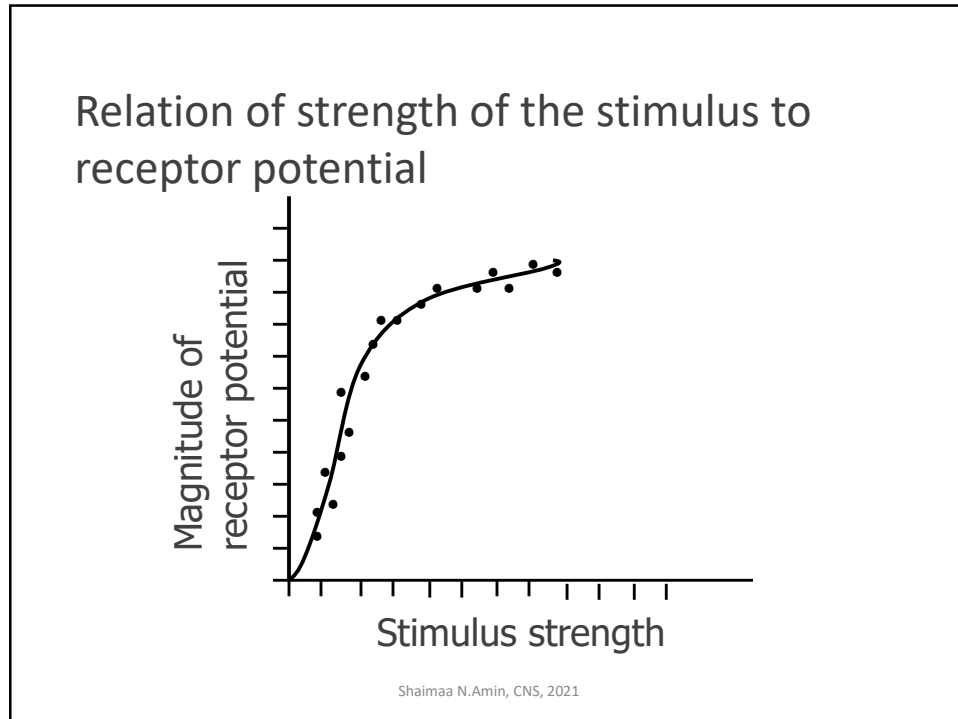
S: stimulus intensity.

K :constant.

This means that 100 fold increase in stimulus intensity, will increase the perceived sensation by 2 times, 1000 fold increase will increase sensation by 3 times and so forth.

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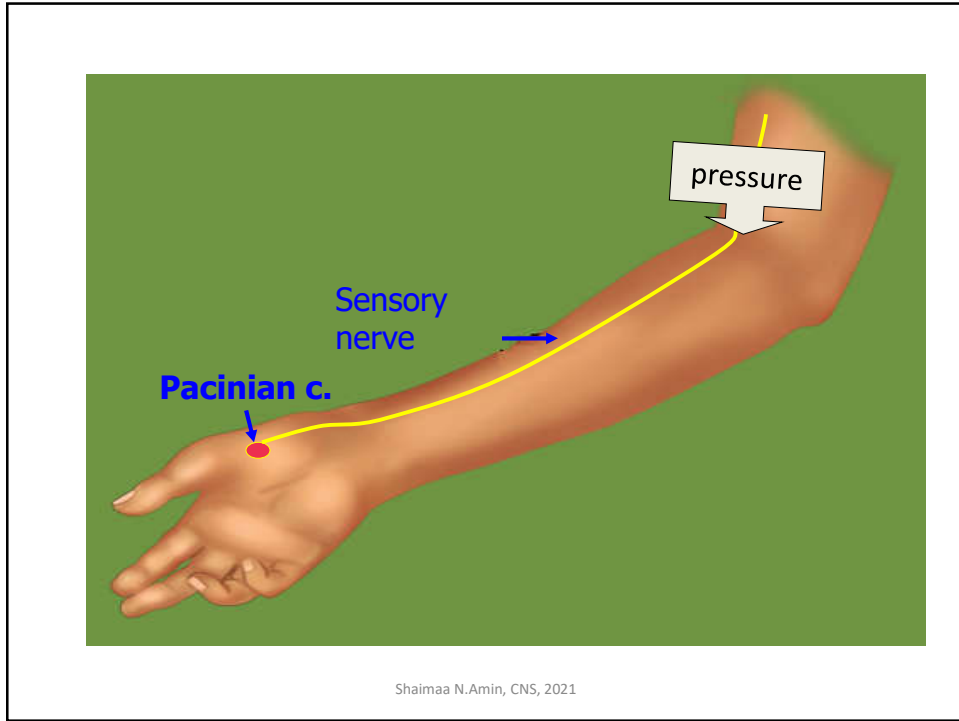
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Coding of sensory information

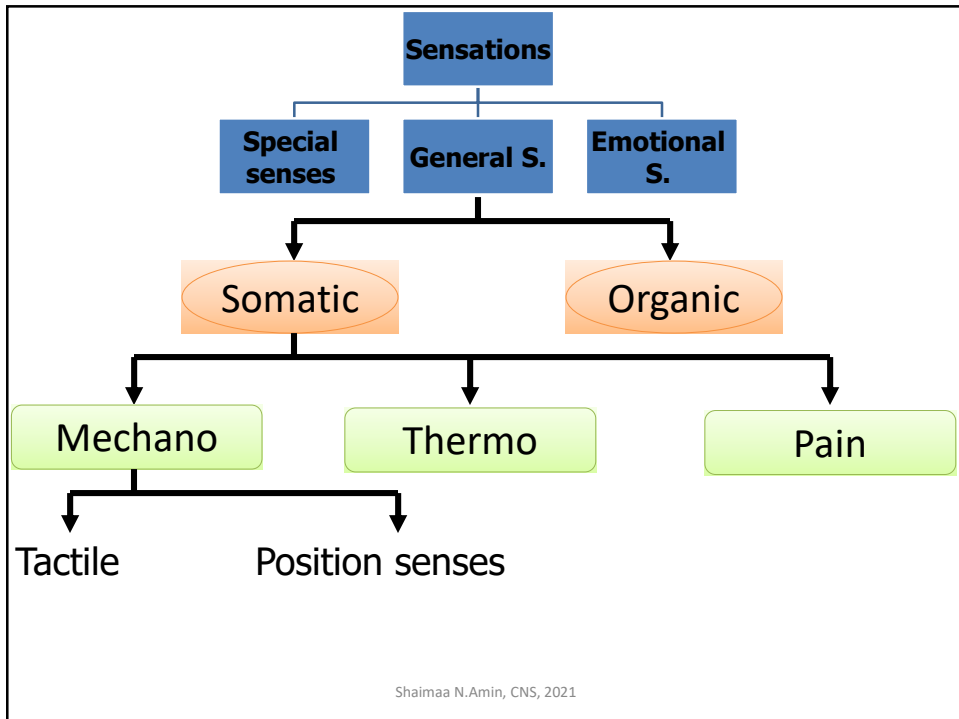
- 1-Modality (Muller's Law, Labeled line Principle)
- 2-Locality (Law of Projection)
- 3-Intensity (Recruitment of receptors, frequency on impulses).

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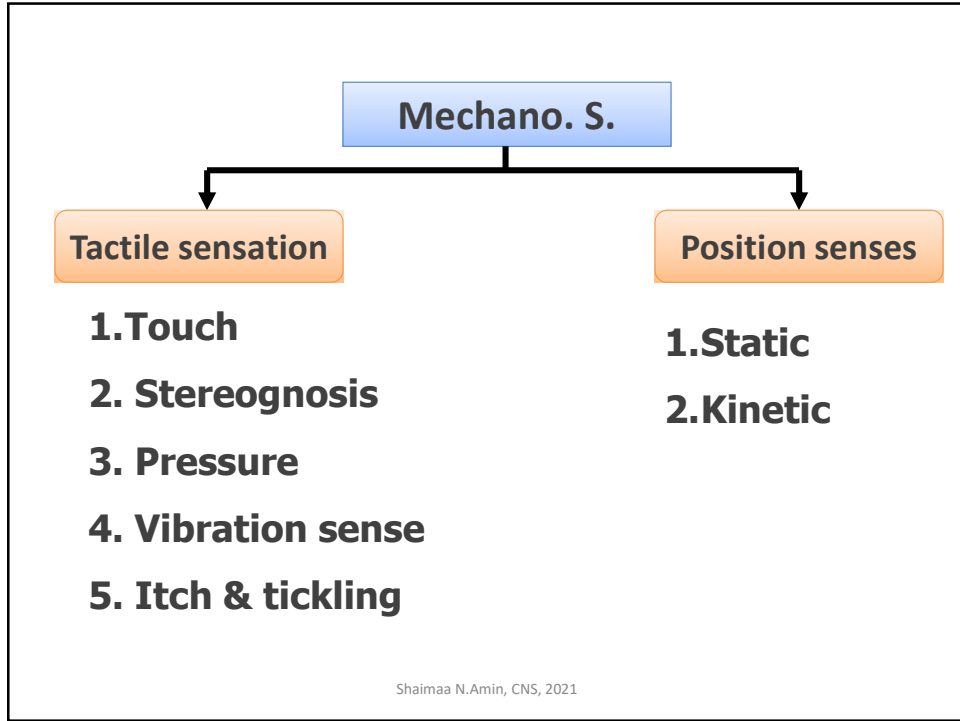
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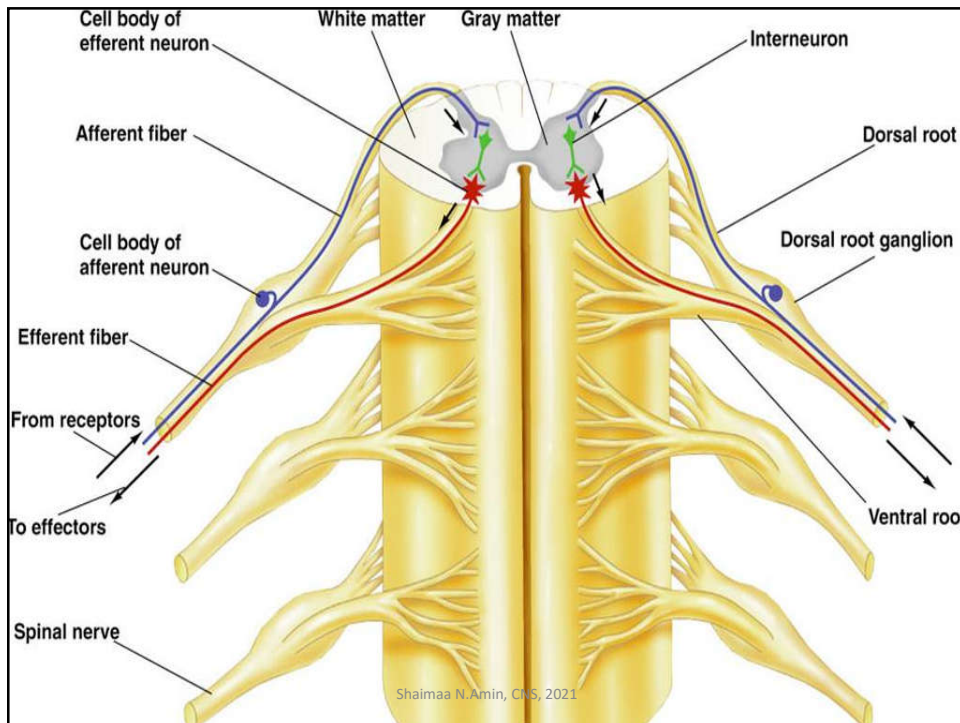
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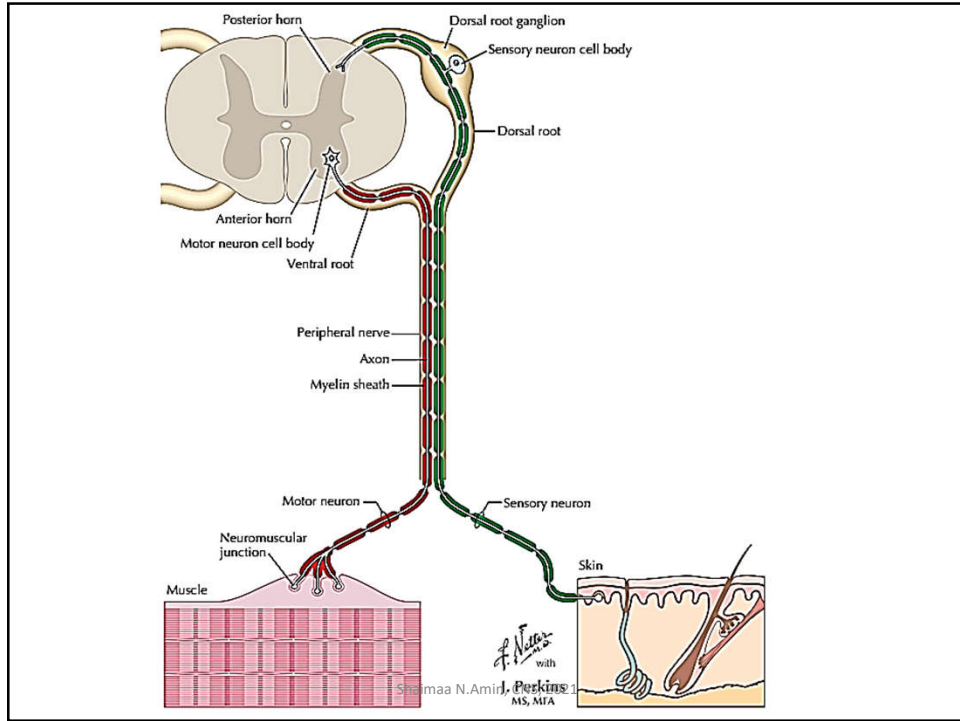
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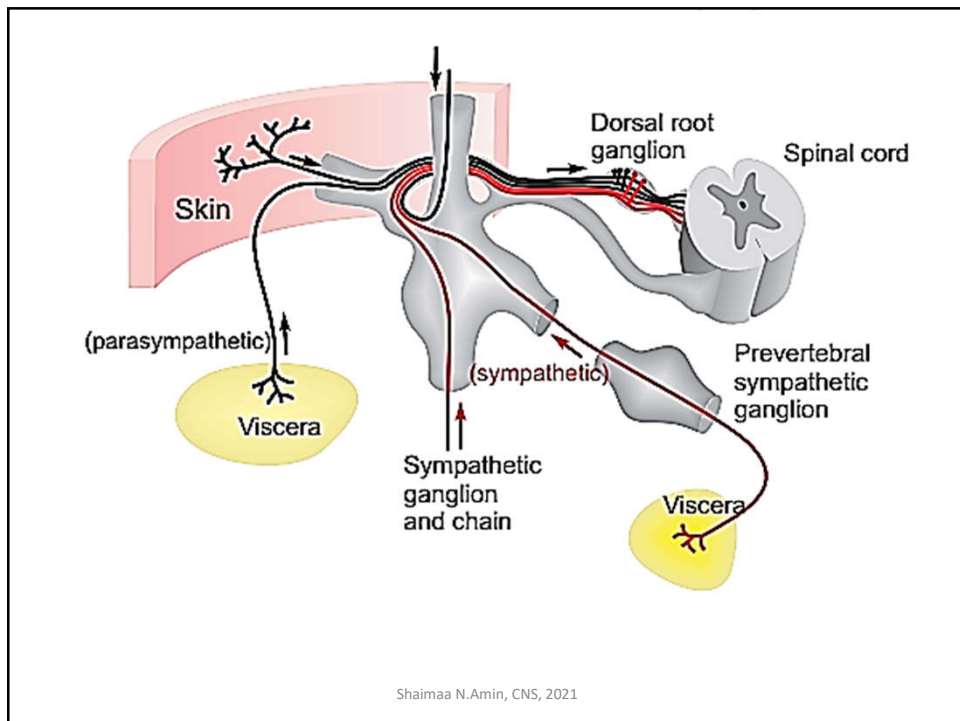
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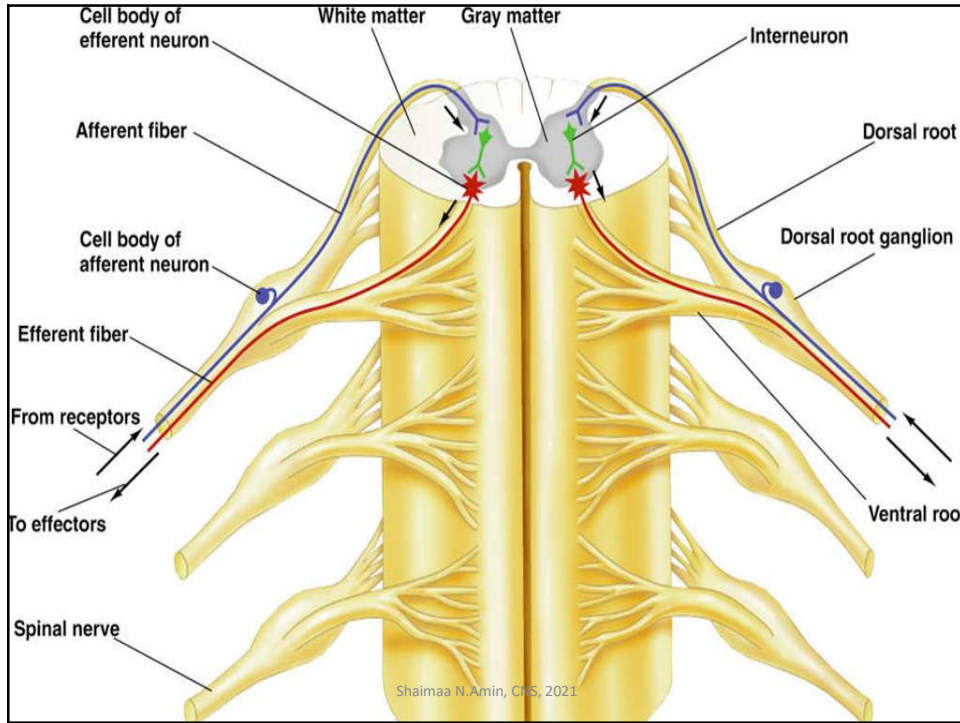
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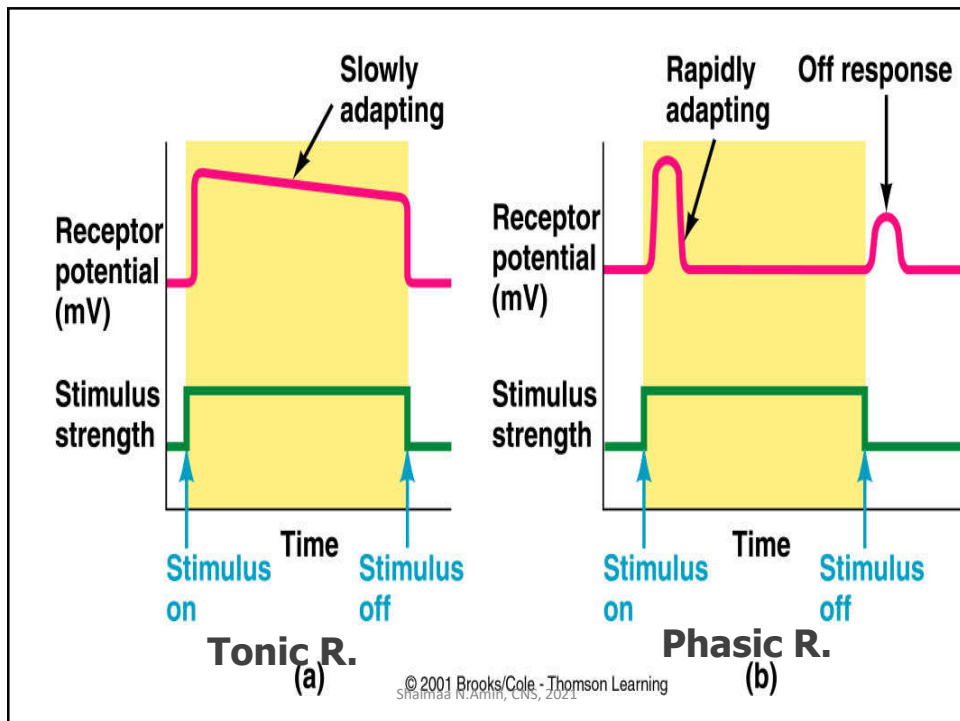
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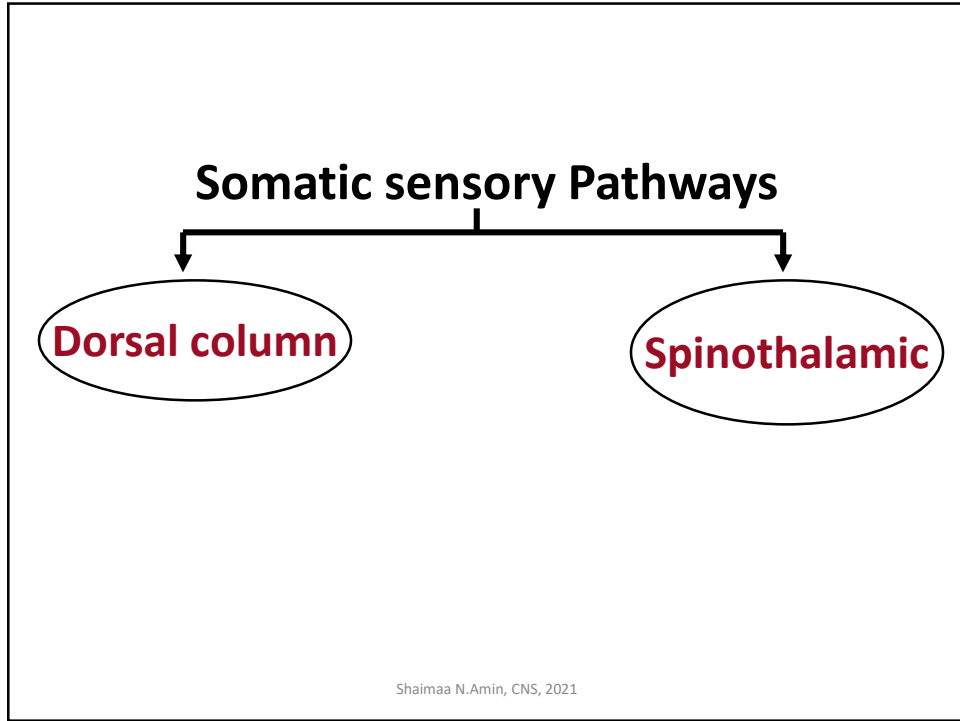
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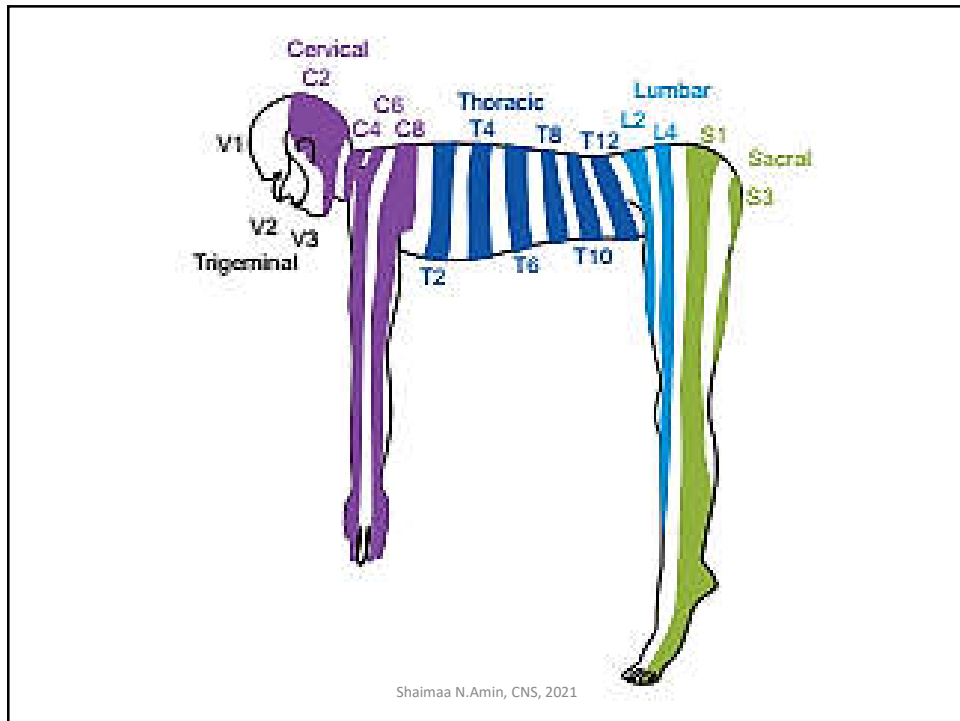
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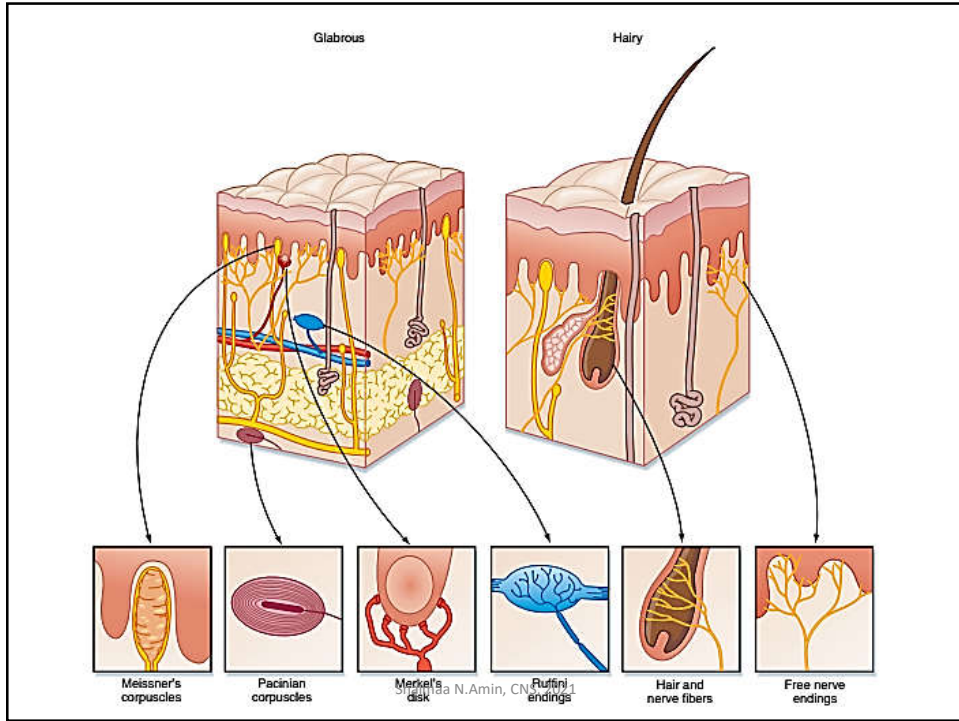
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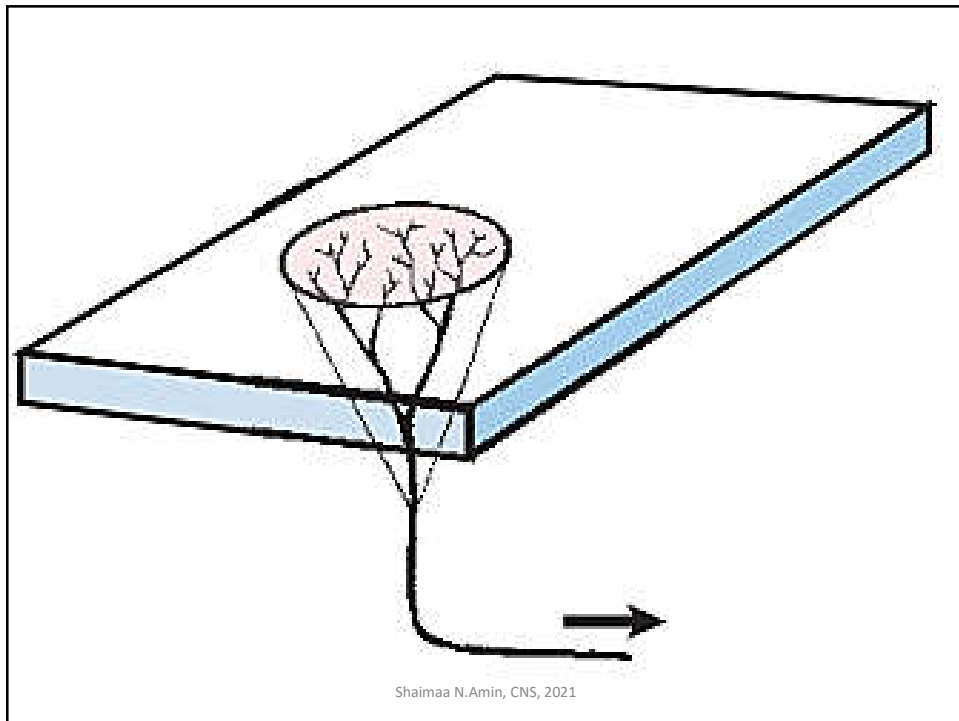
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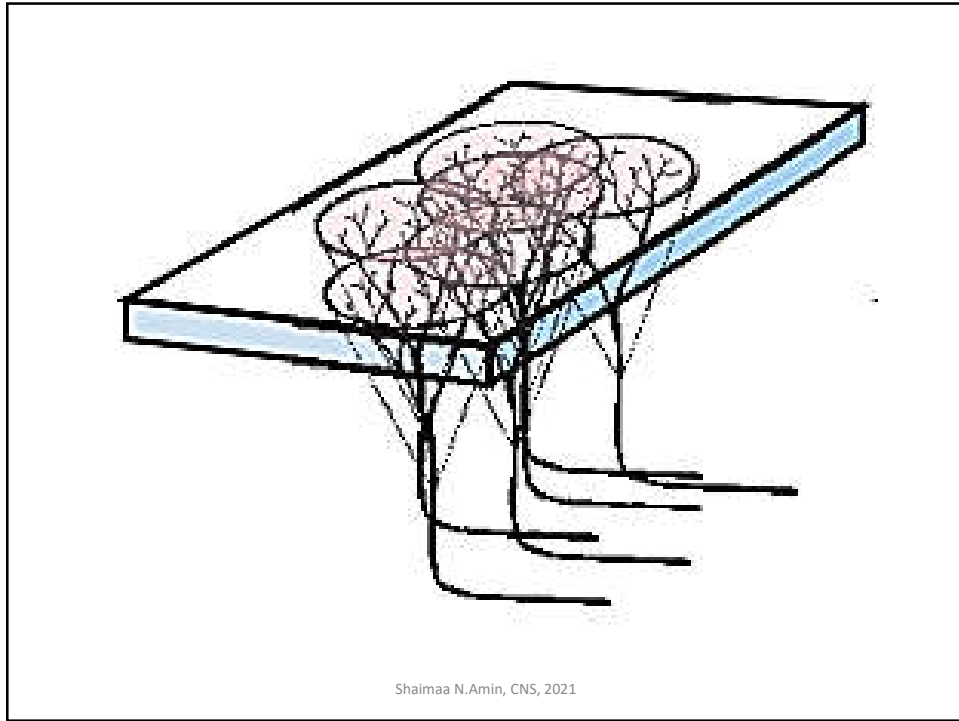


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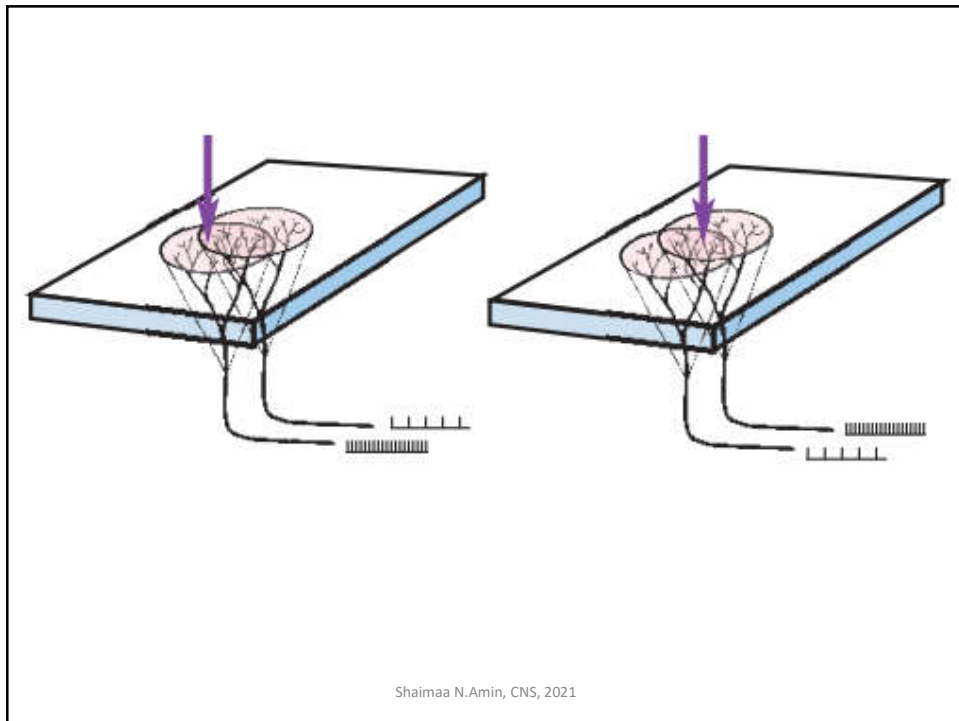


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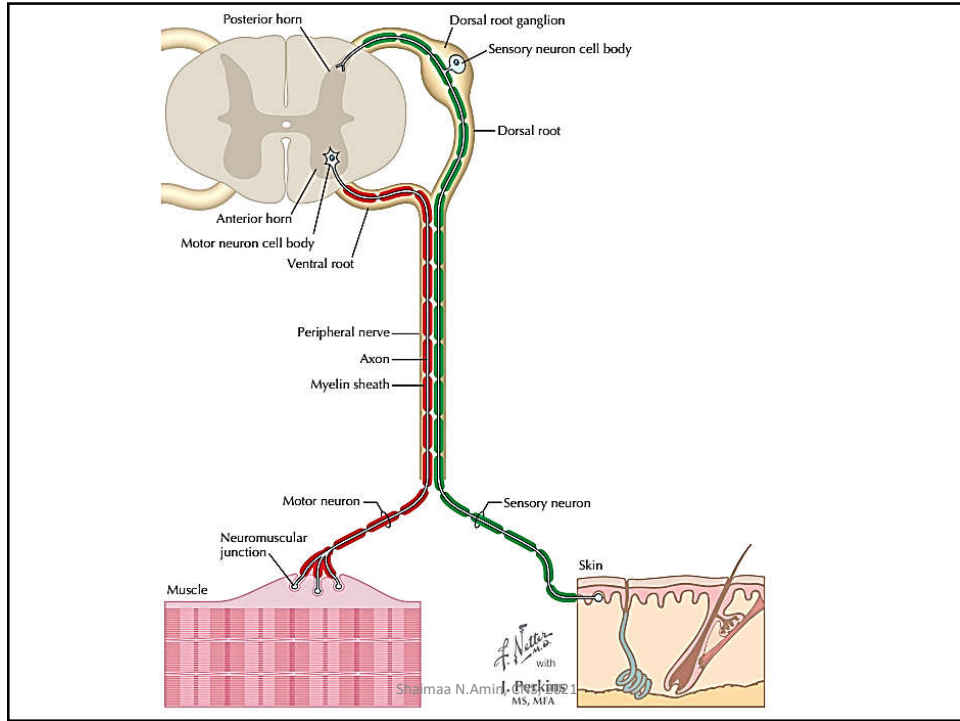
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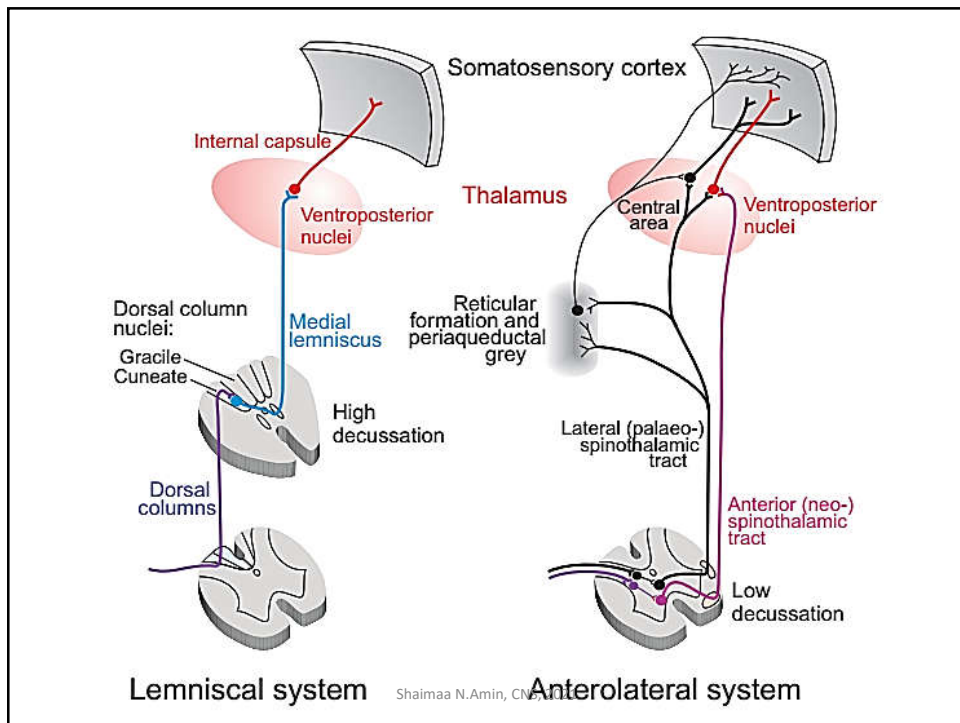
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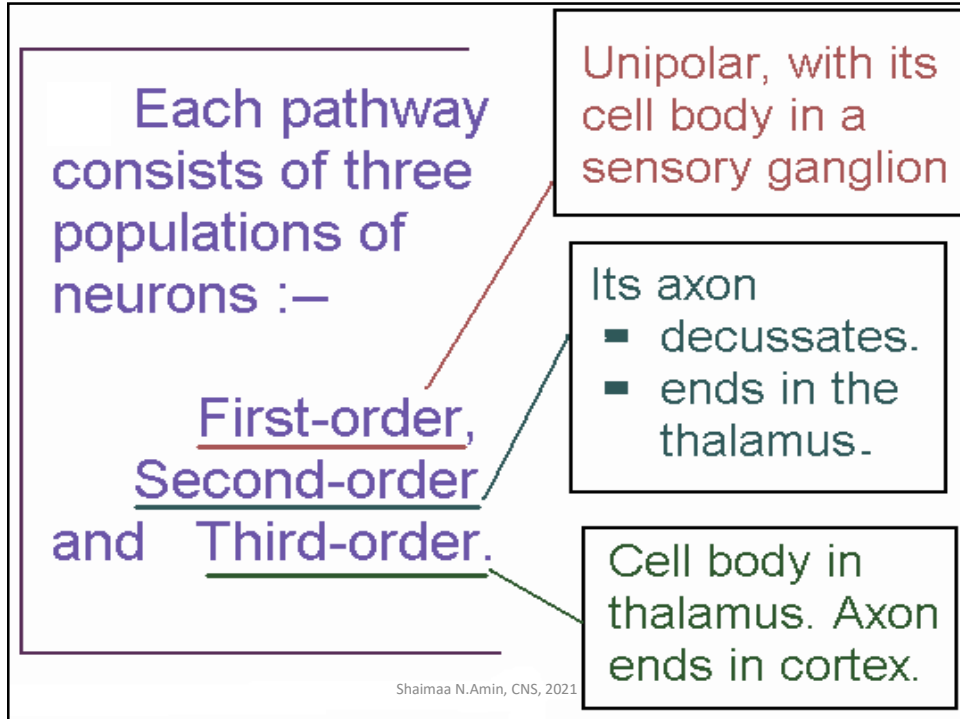
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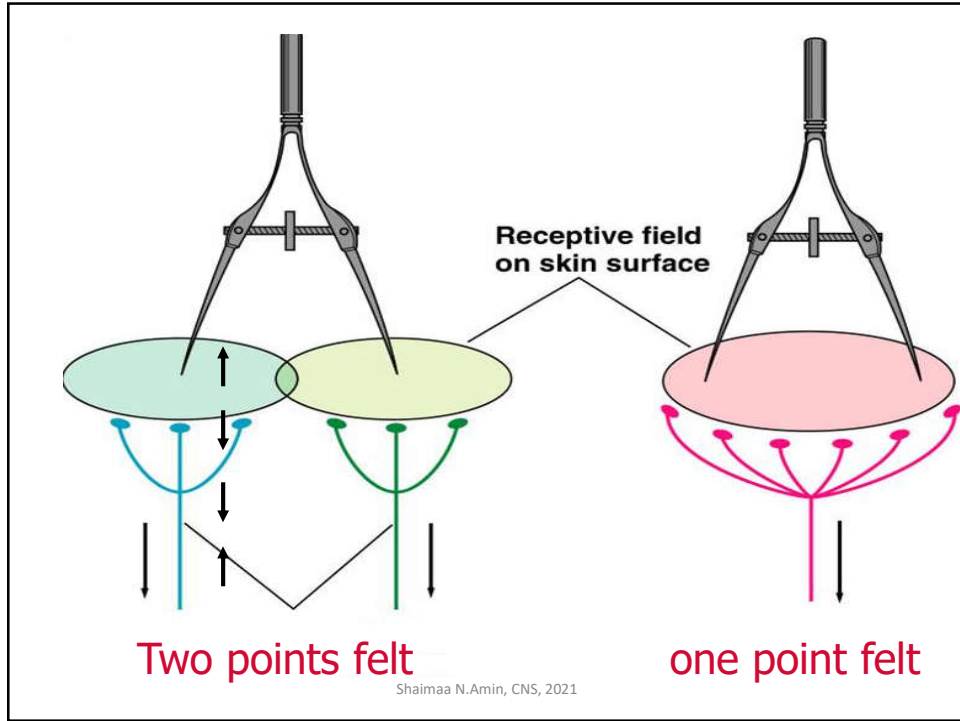
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Sensations carried by dorsal column

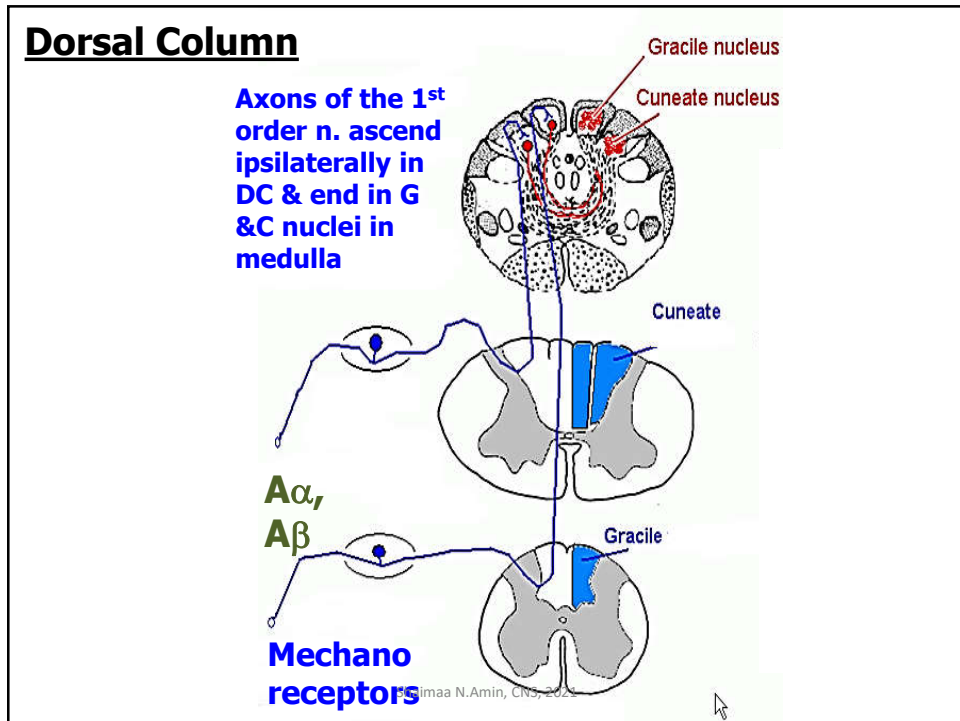
Sensation	Receptor	Afferent fiber
Fine touch	M & M	A β
Stereognosis	mixture	A β
Pressure	Pacinian & spray	A β
Vibration S.	Pacinian & Me.	A β
Position S.	Pacinian R & S	A α

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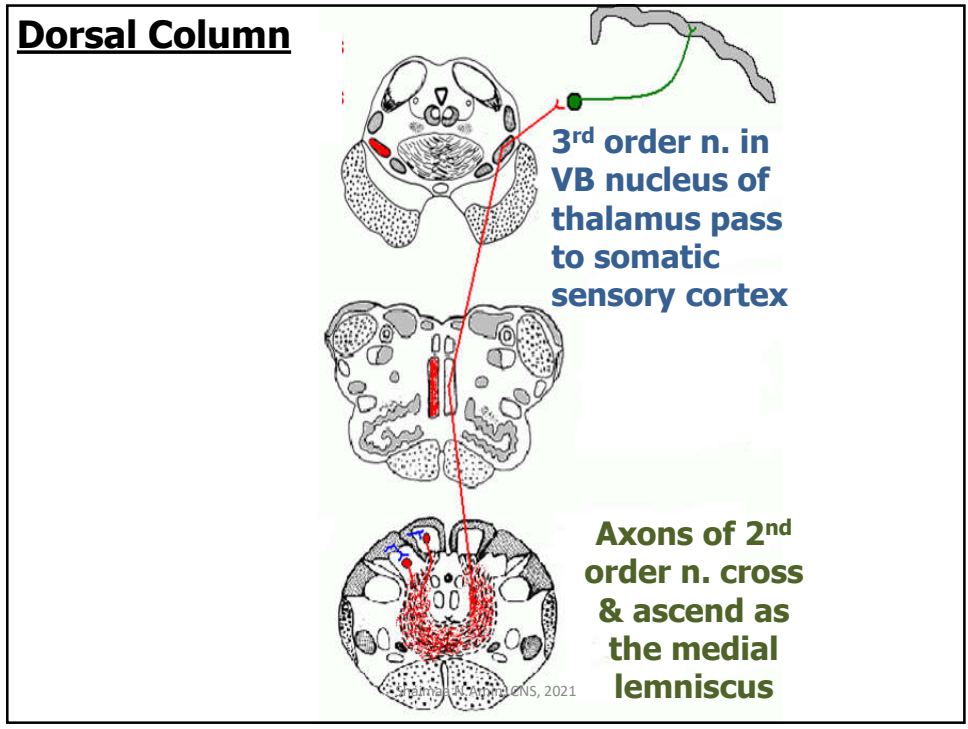
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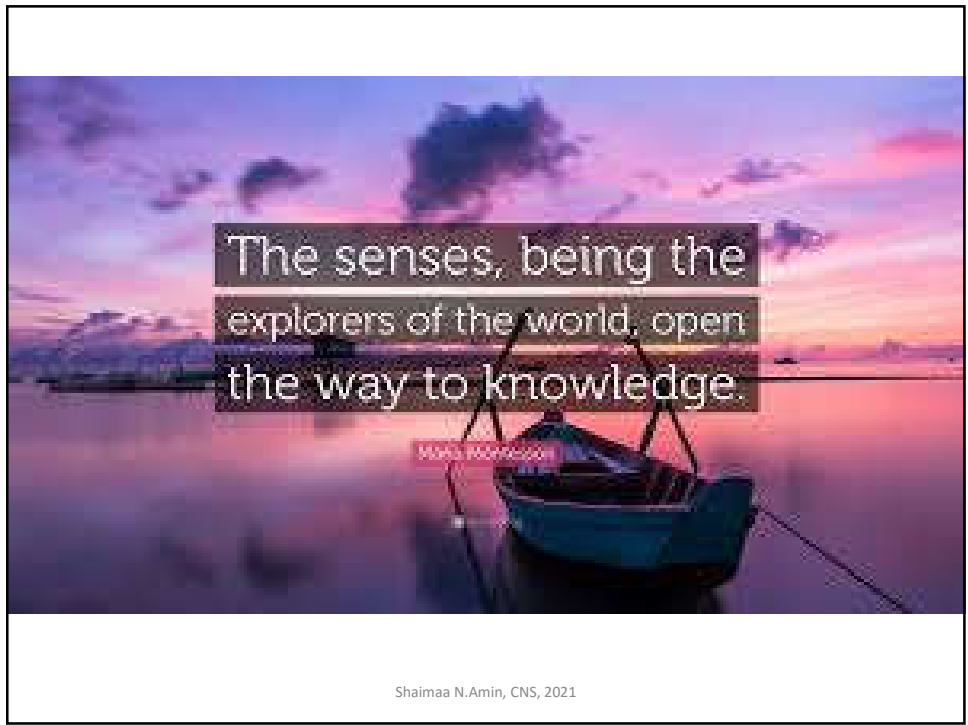
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