



كلية الطب البشري
Faculty of Medicine




CNS Module
Physiology Lectures
(Lecture 4)

Topic 2: Spinal cord & somatic sensations

Spinal Reflexes(Part 1)

Presented by:
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Human reflexes, Reflex arc, Types of reflexes.

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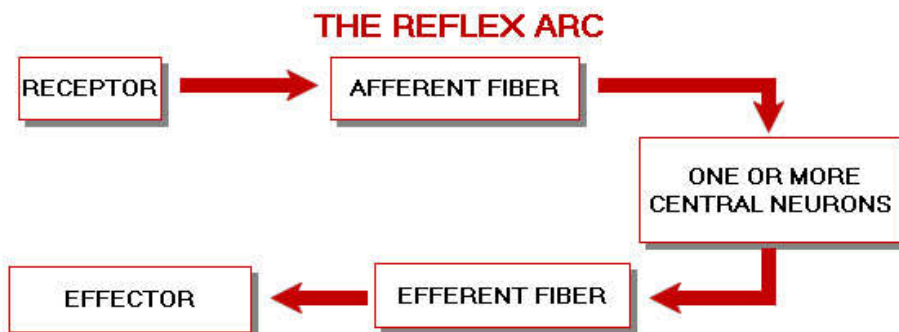
What is meant by a reflex?

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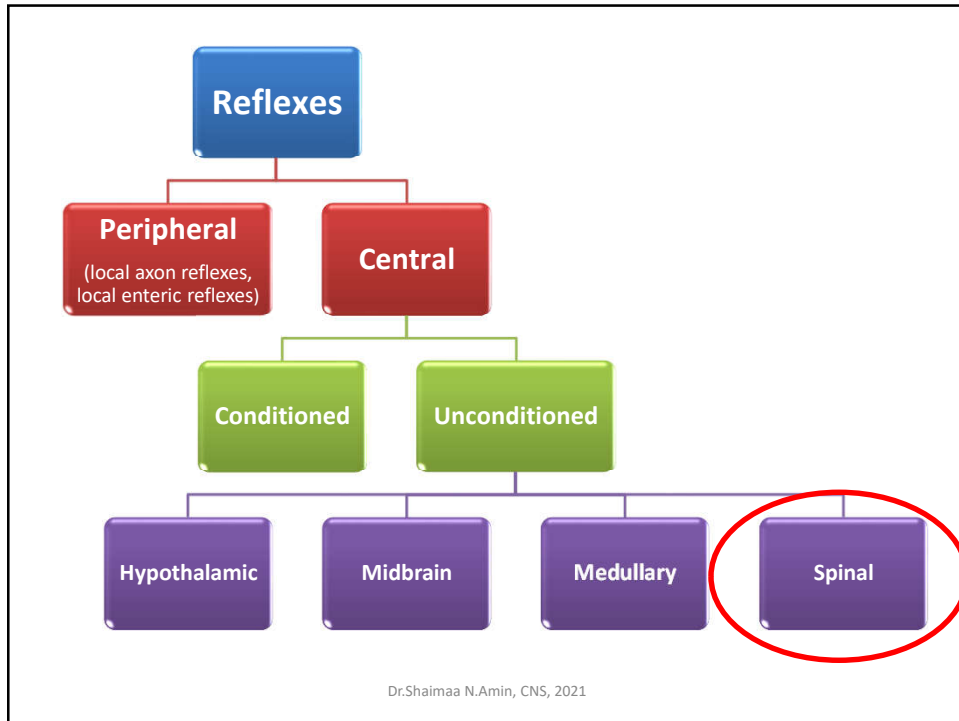
The reflex arc

-The basic circuit that underlies a reflex.

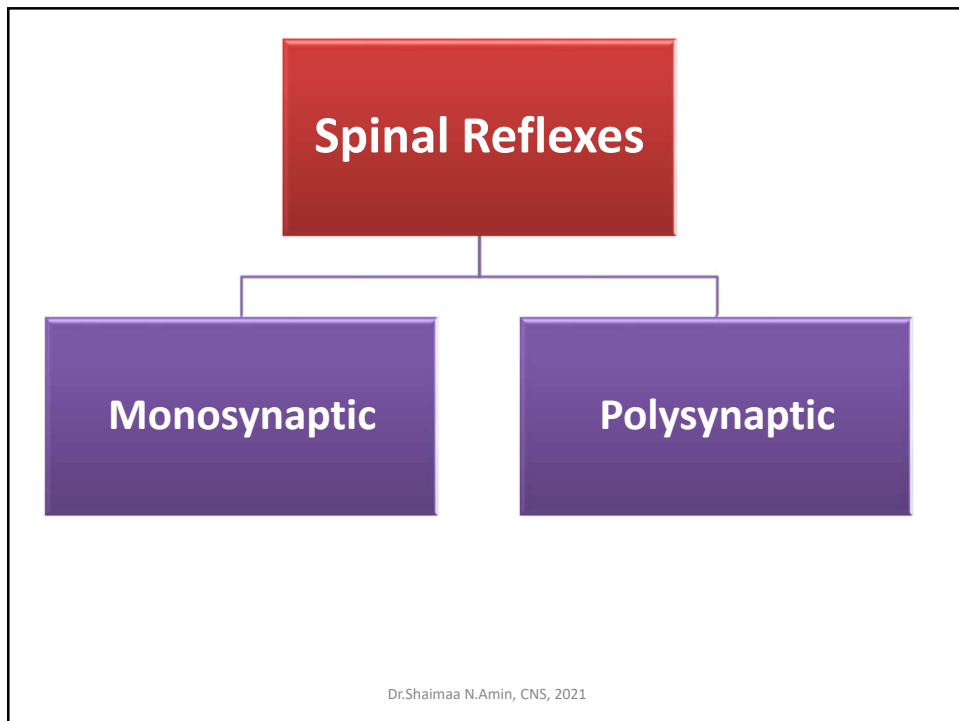


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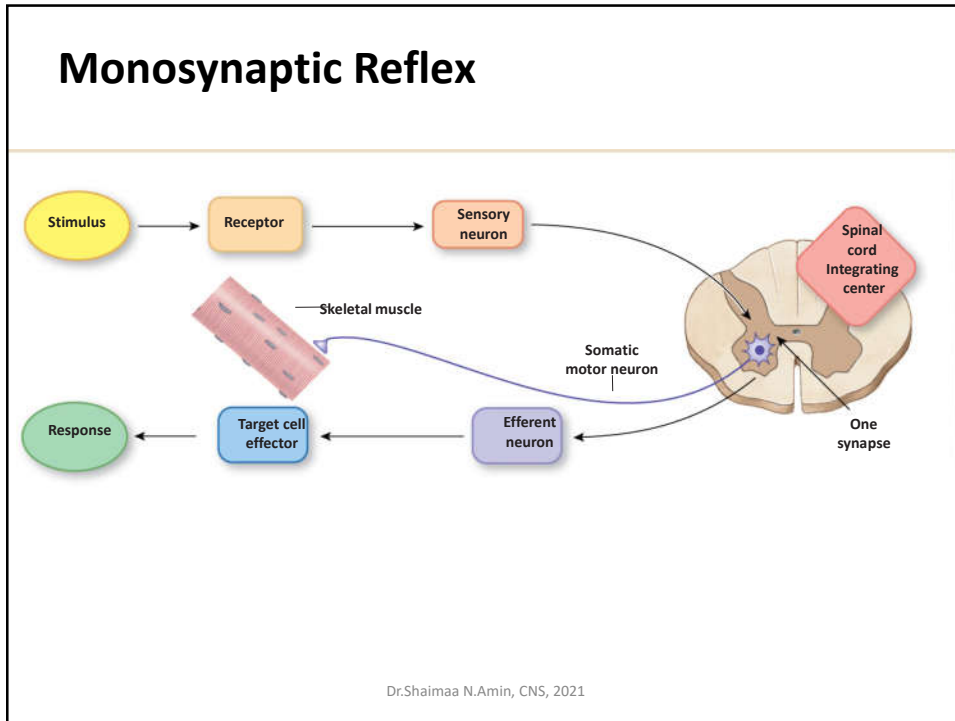


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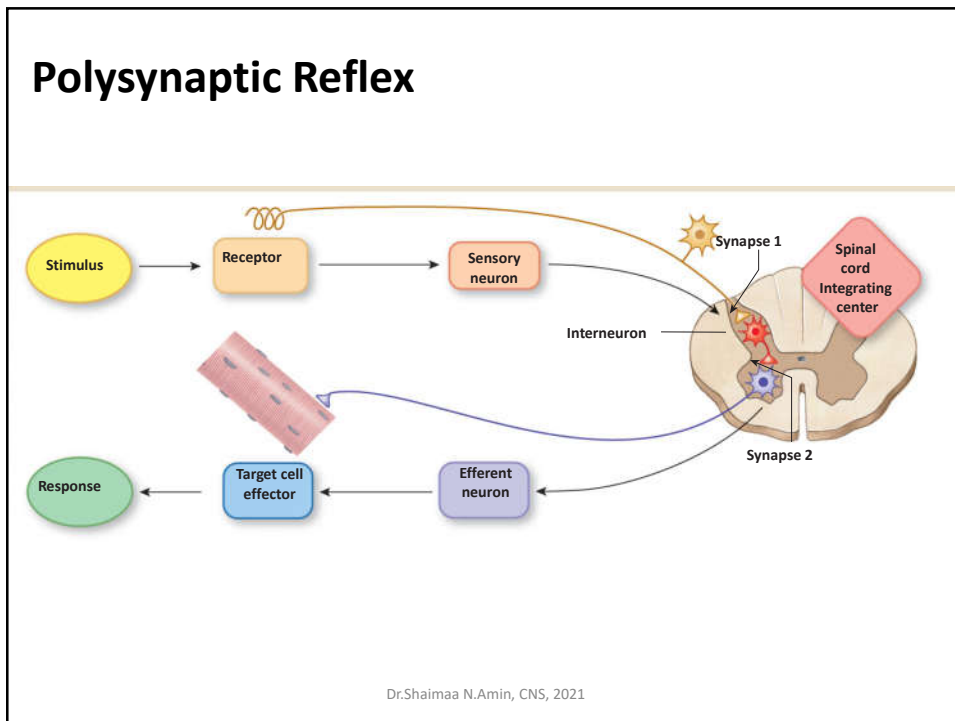
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Monosynaptic Reflex



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Polysynaptic Reflex

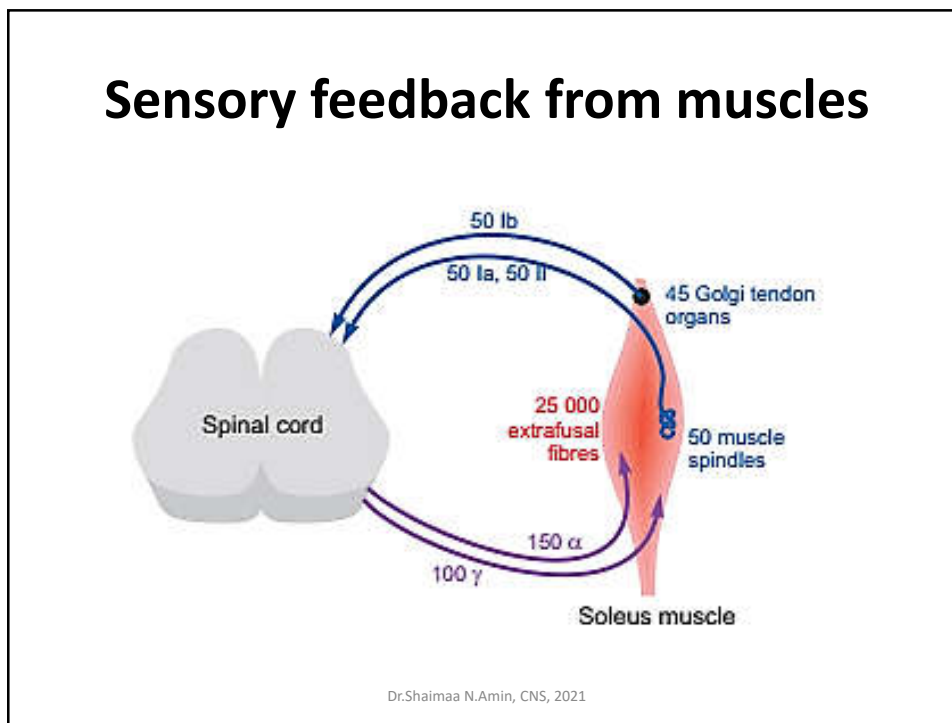


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Type	Receptor	Axon	Sensitive to
Ia	Primary spindle endings	12-20 μm myelinated	Muscle length and rate of change of length
Ib	Golgi tendon organs	12-20 μm myelinated	Muscle tension
II	Secondary spindle endings	6-12 μm myelinated	Muscle length (little rate sensitivity)
II	Nonspindle endings	6-12 μm myelinated	Deep pressure
III	Free nerve endings	2-6 μm myelinated	Pain, chemical stimuli, and temperature (important for physiological response to exercise)
IV	Free nerve endings	0.5-2 μm nonmyelinated	Pain, chemical stimuli, and temperature

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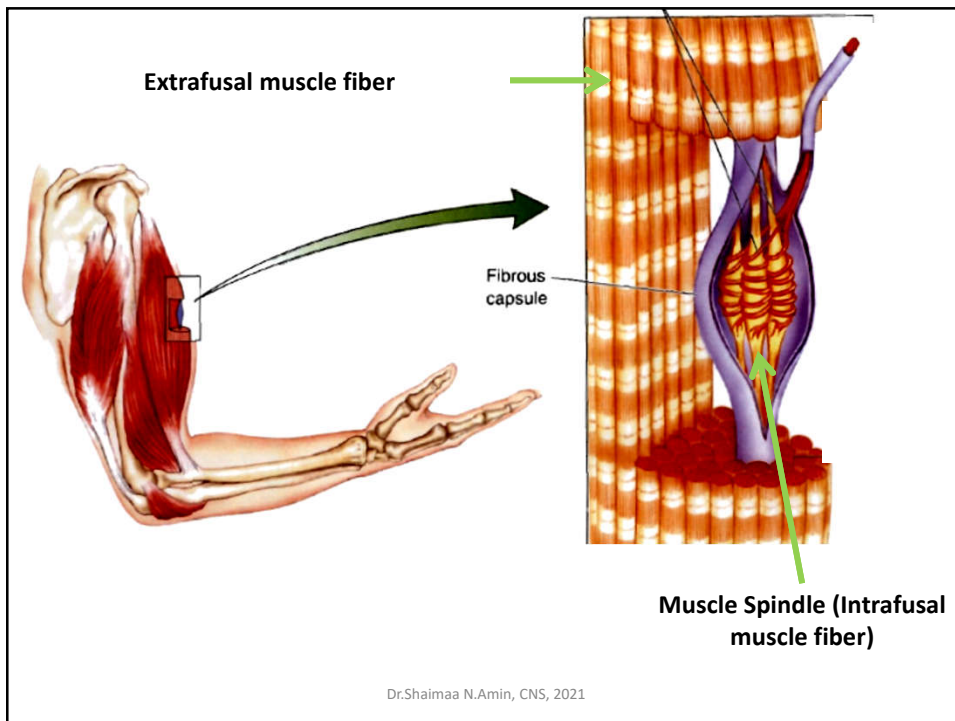
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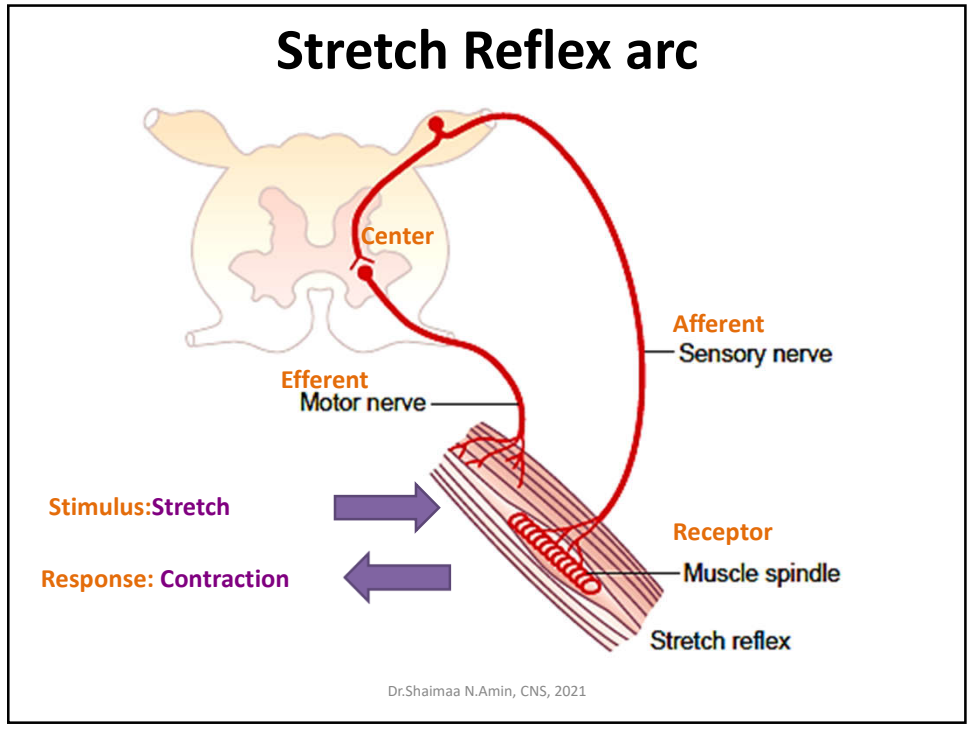
Stretch Reflex (Stretch reflex arc , Functional anatomy of the muscle spindle)

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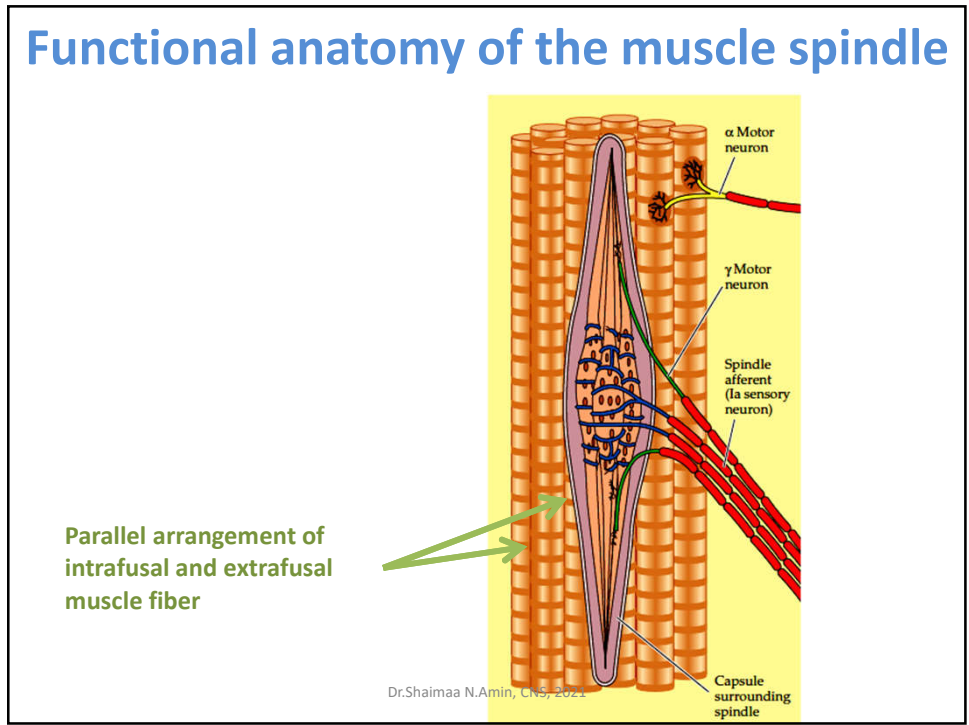
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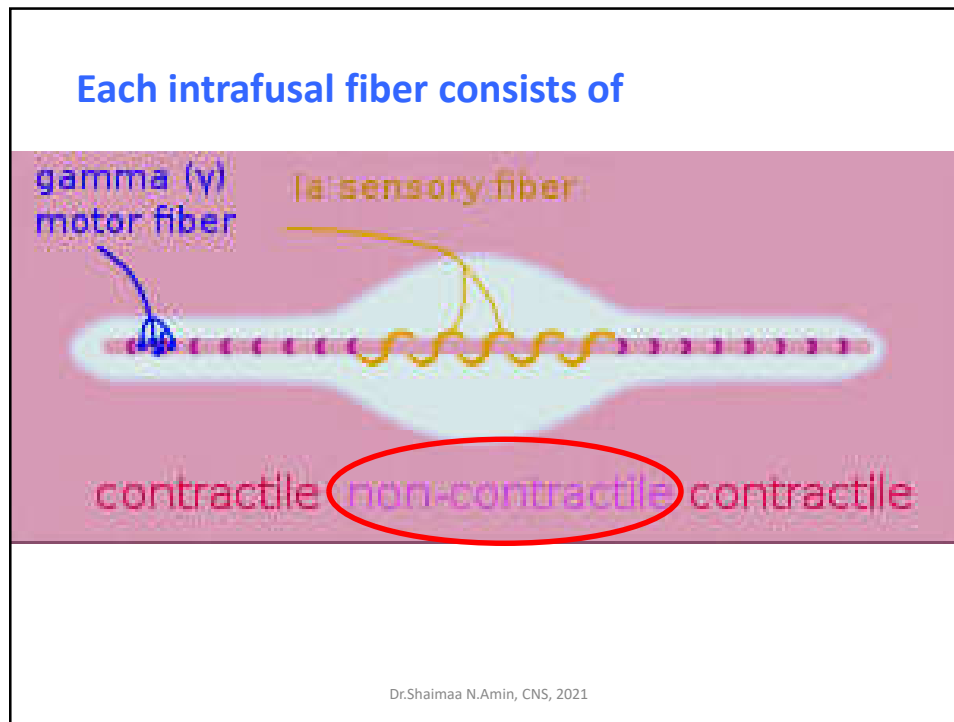
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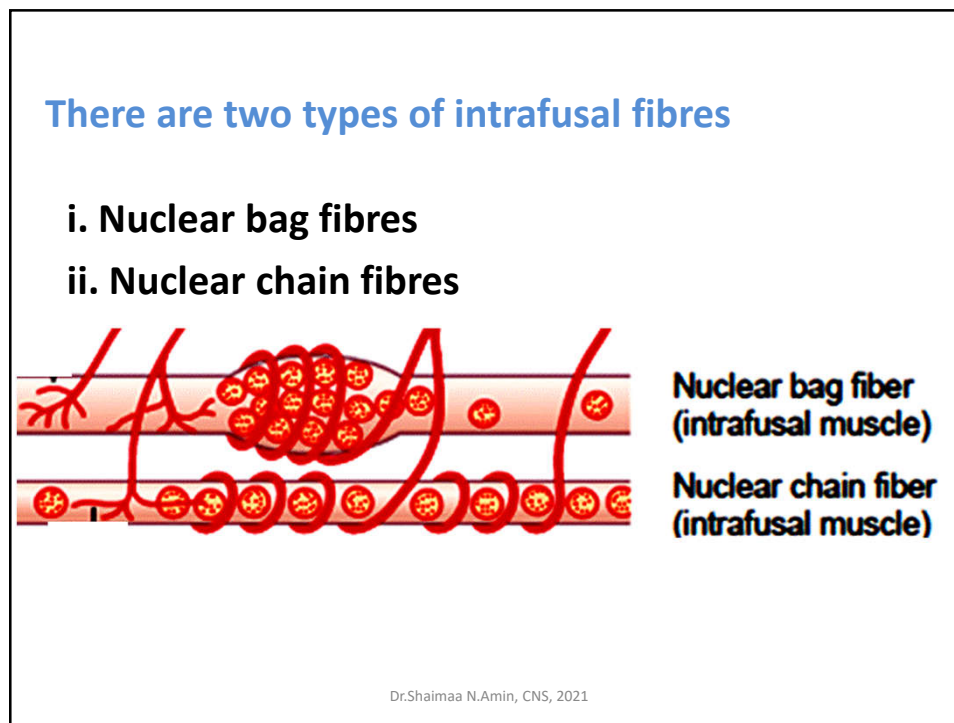
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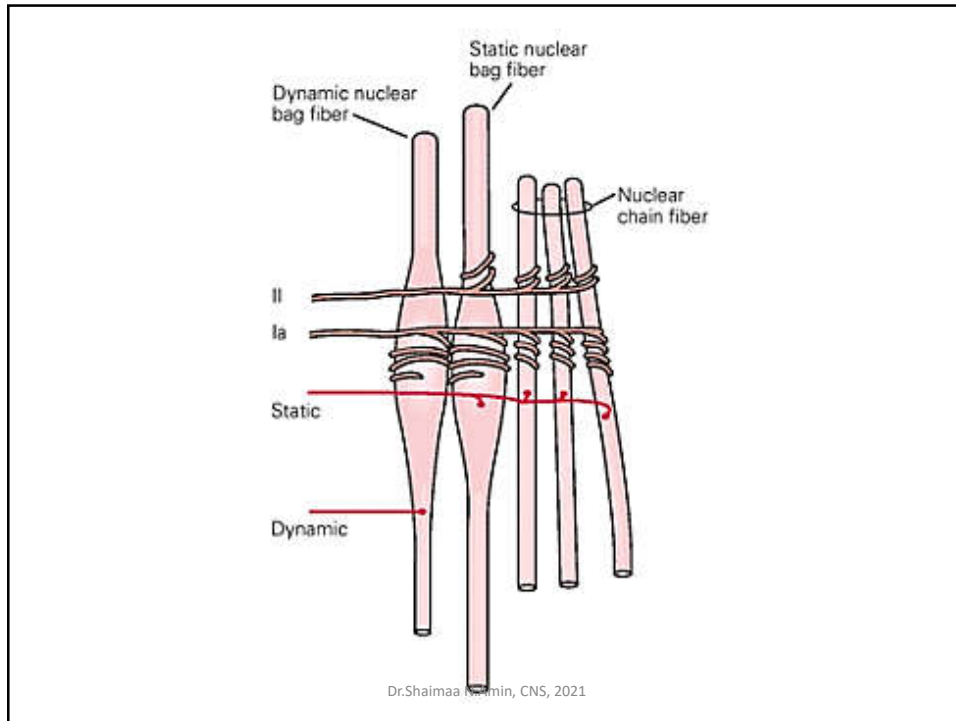
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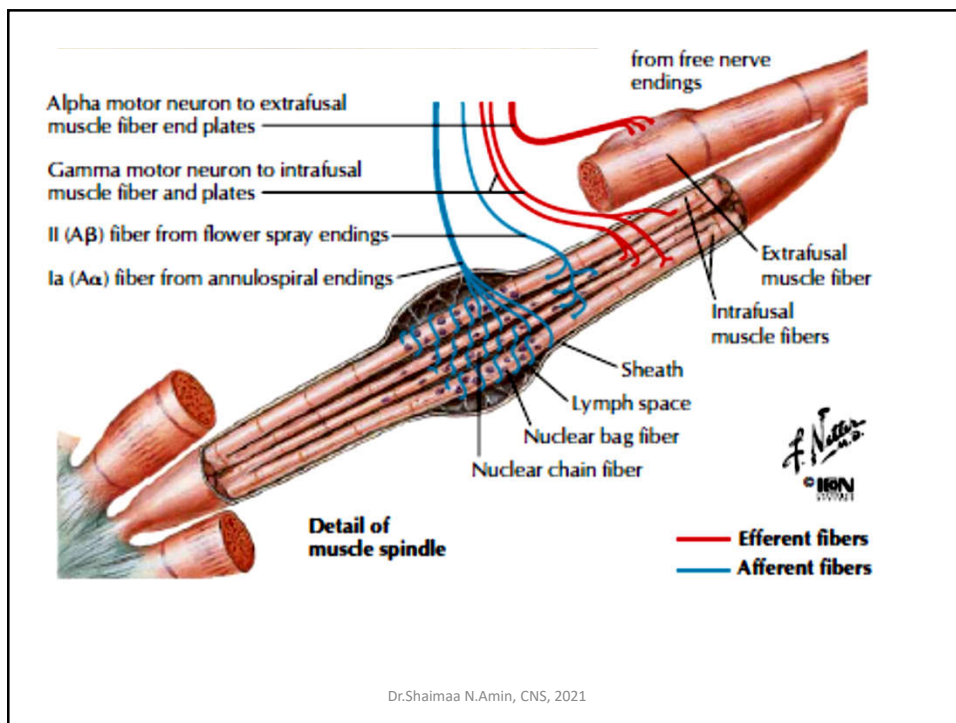
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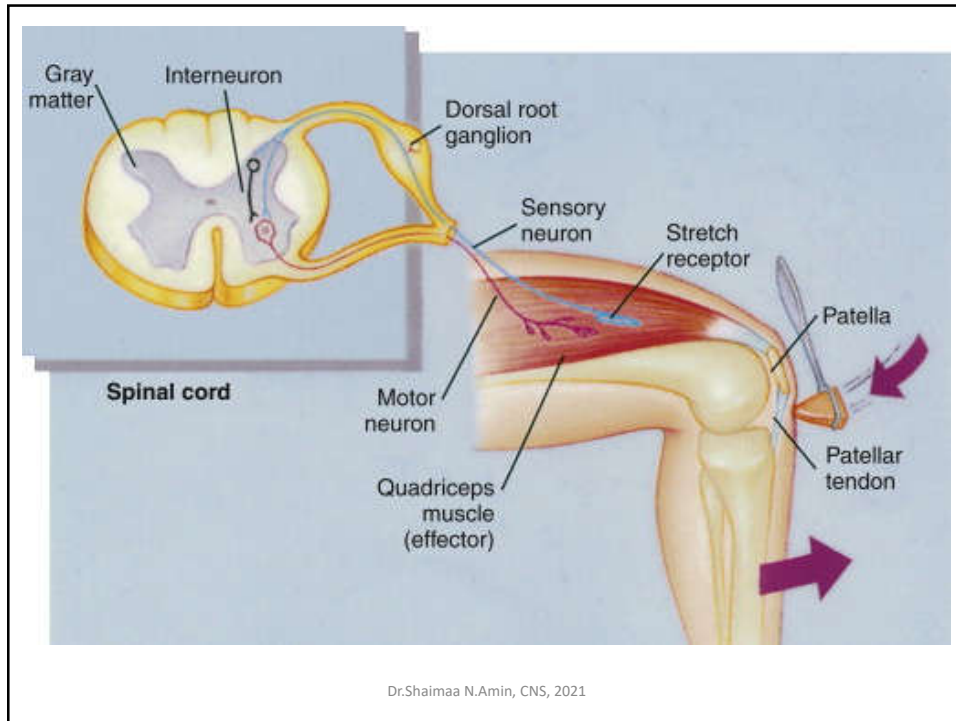
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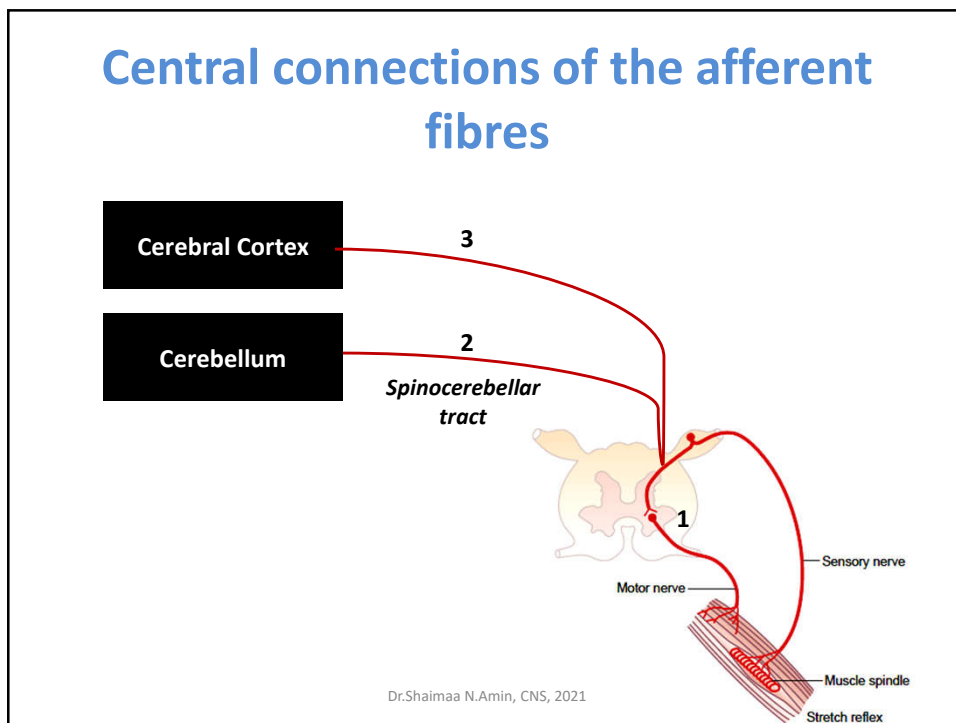
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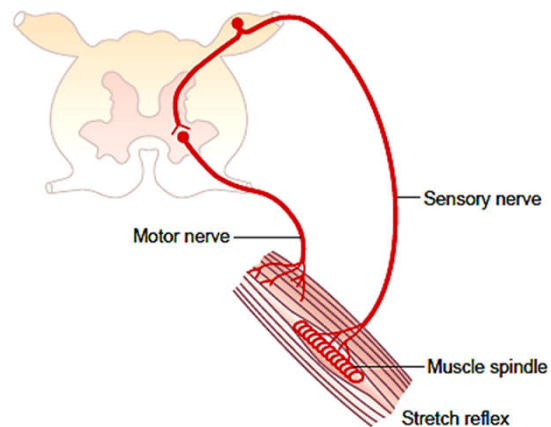
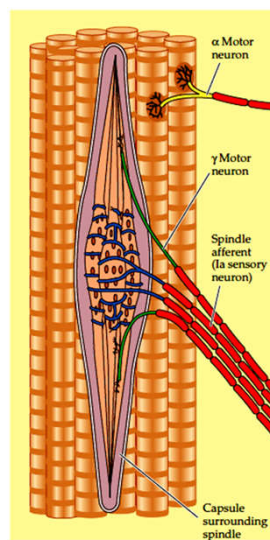
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Physiological significance of the stretch reflex

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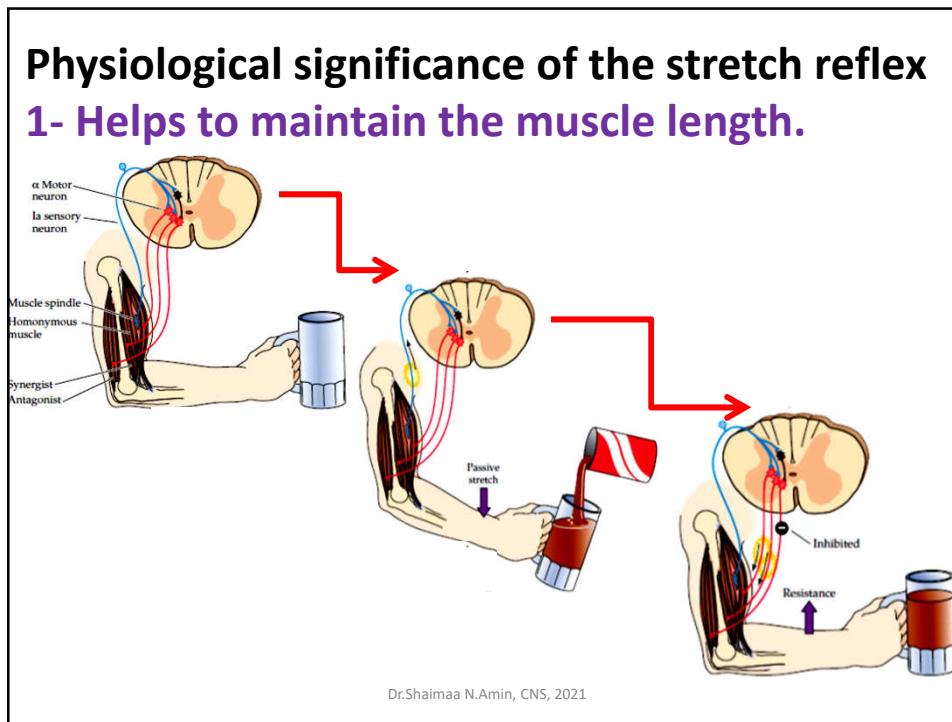
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Physiological significance of the stretch reflex 1- Helps to maintain the muscle length.



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Physiological significance of the stretch reflex
2-Muscle tone

Def: Muscle tone is **continuous, alternating, reflex, subtetanic** contraction of muscle fibres.

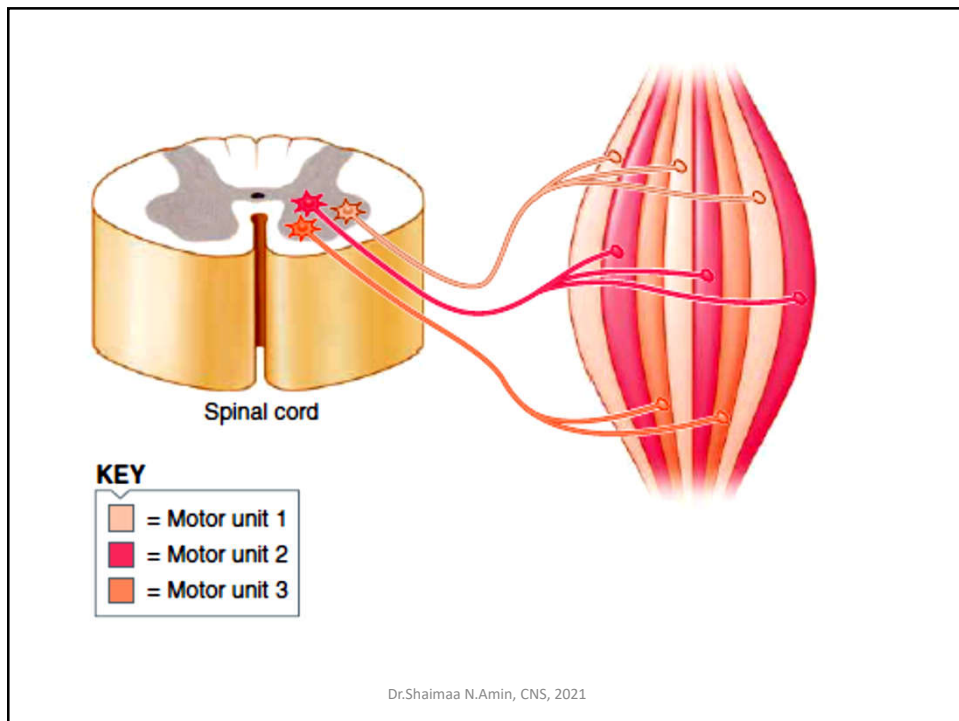
- It may also defined as the resistance of the muscle to stretch.
- Base of muscle tone: Static stretch reflex

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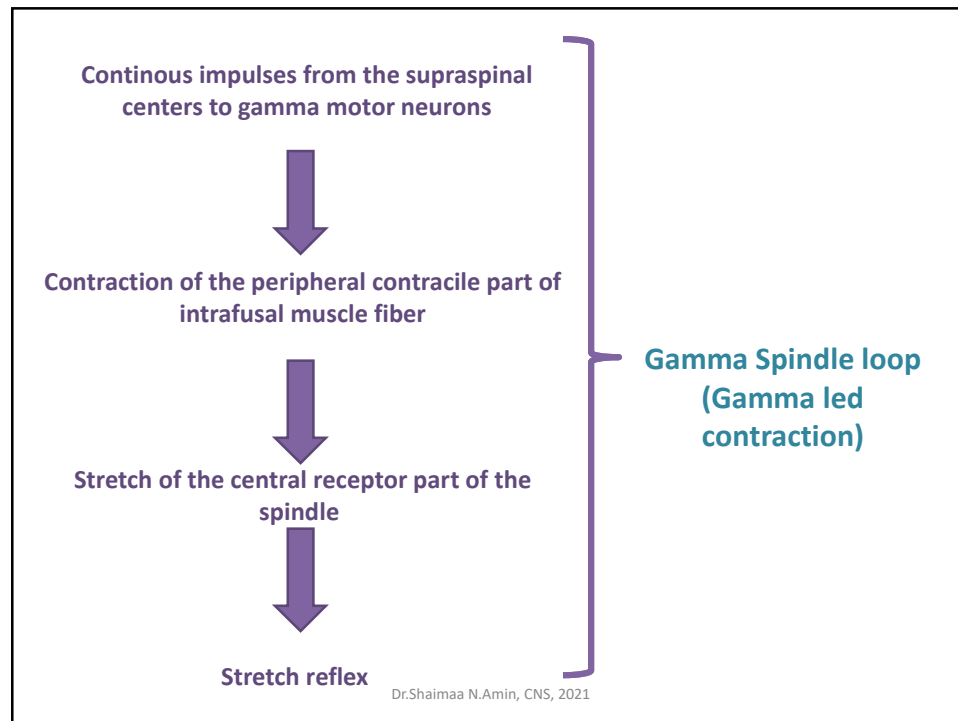
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During rest the muscle spindle is continuously stretched



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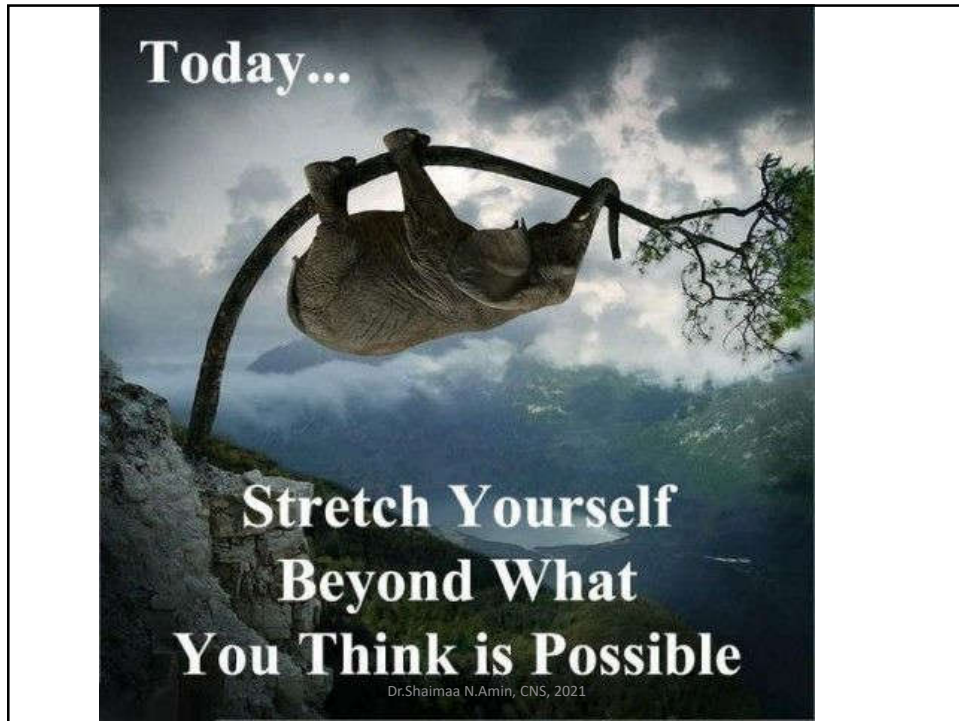
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Muscle tone does not cause fatigue ?



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