

Module 12 L03

Reflexes

Dr. Lisa Brinn

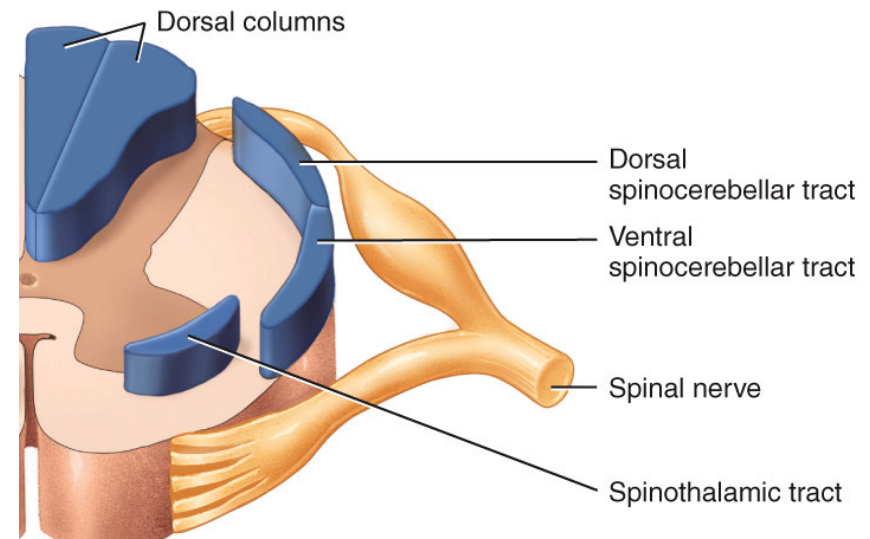
lbrinn@fiu.edu

3. Reflexes

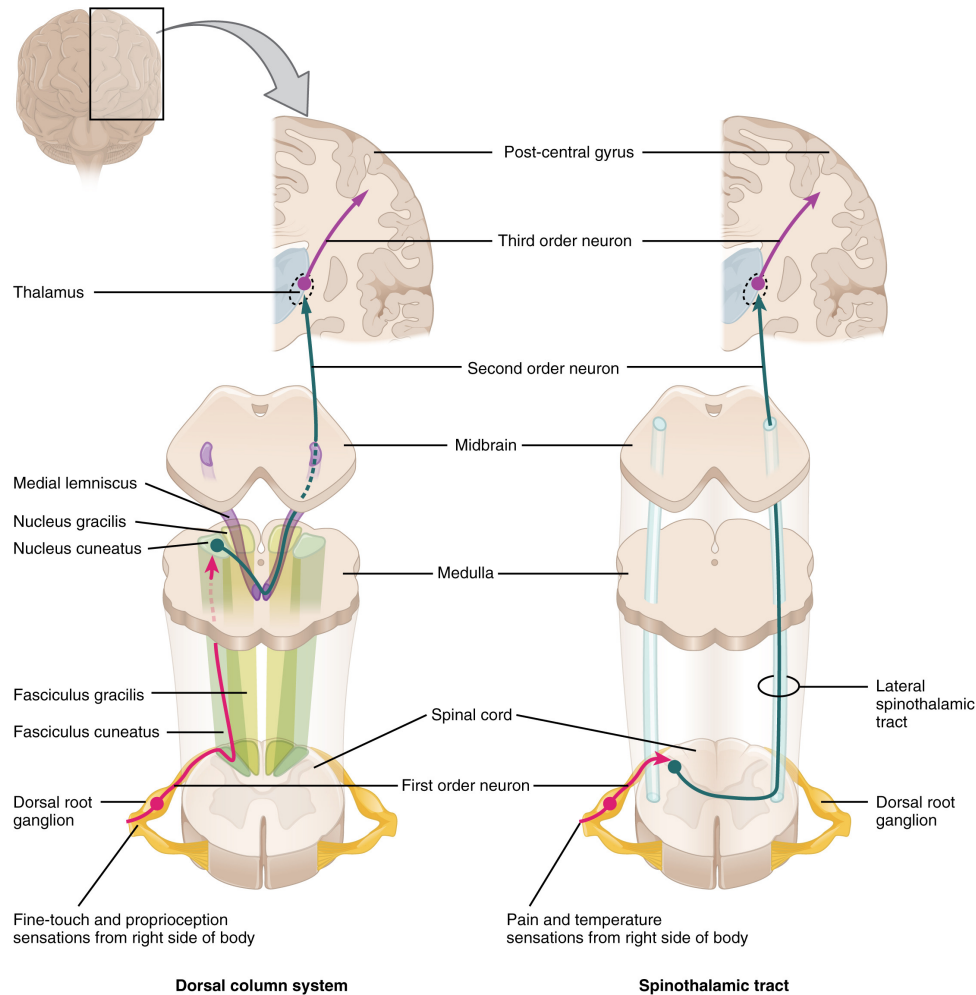
- Spinal cord functions in homeostasis
 - A. Action potential propagation
 - White matter tracts serve as “highways”
 - B. Integration of information
 - Gray matter – receives and integrates incoming and outgoing information

Spinal Cord Major Sensory Tracts

- Sensory Tracts
 - A. Dorsal (posterior) columns
 - convey action potentials for touch, pressure, vibration and proprioception
 - B. Spinothalamic tracts
 - conveys action potentials for sensing pain, temperature, itch and tickle
 - a) Lateral spinothalamic tract
 - b) Anterior spinothalamic tract

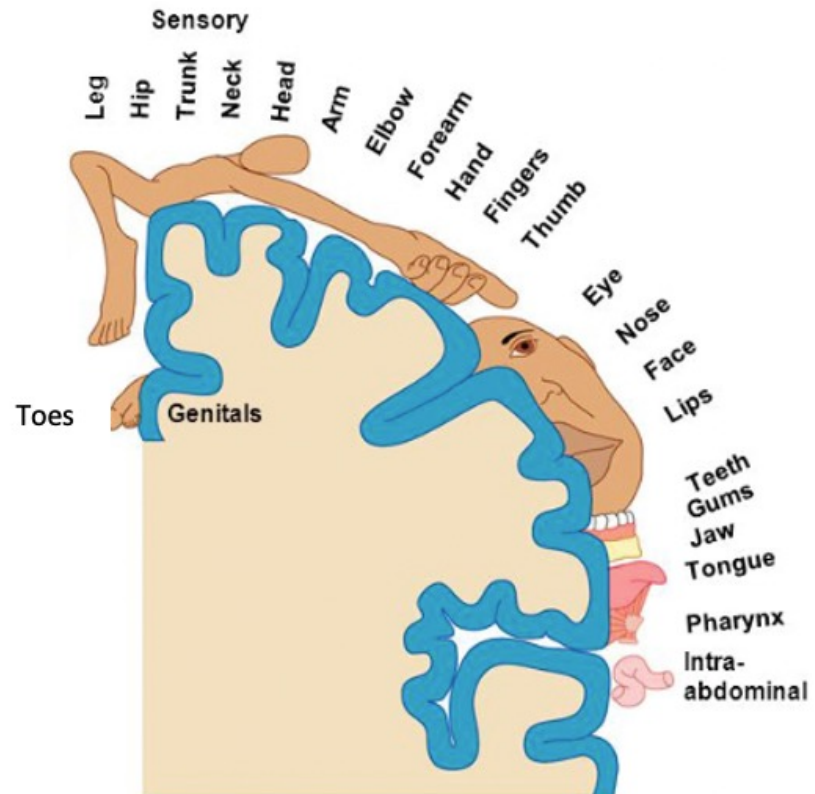


Sensory Action Potential Propagation



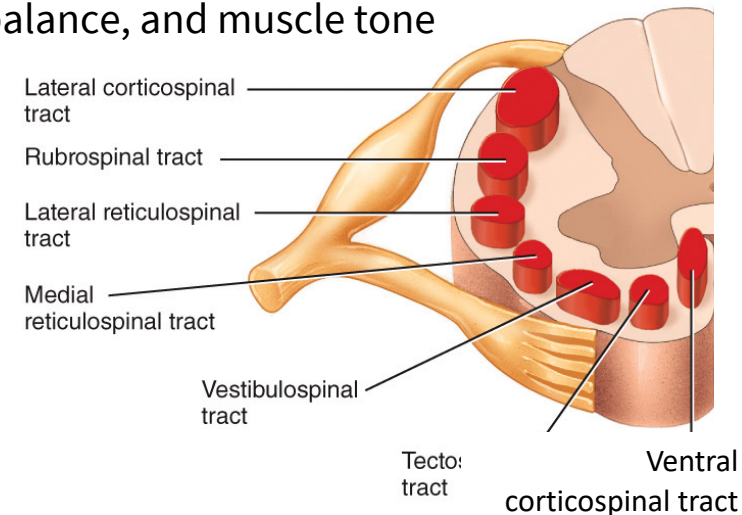
Sensory Homunculus

- A cartoon representation of the sensory homunculus arranged adjacent to the cortical region in which the processing takes place.

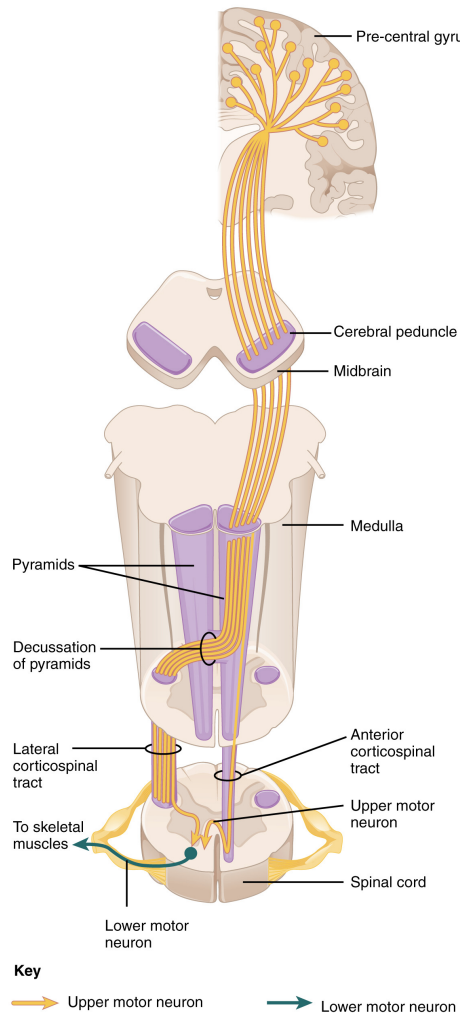


Spinal Cord Major Motor Tracts

- Motor tracts
 - A. Direct pathway – pyramidal pathway
 - convey action potentials to cause voluntary movements of skeletal muscles
 - a) Lateral corticospinal tract
 - b) Ventral corticospinal tract
 - c) Corticobulbar tract
 - B. Indirect pathway – extrapyramidal pathway
 - convey action potentials that regulate posture, balance, and muscle tone
 - a) Tectospinal tract
 - b) Vestibulospinal tract
 - c) Rubrospinal tract
 - d) Lateral reticulospinal tract
 - e) Medial reticulospinal tract

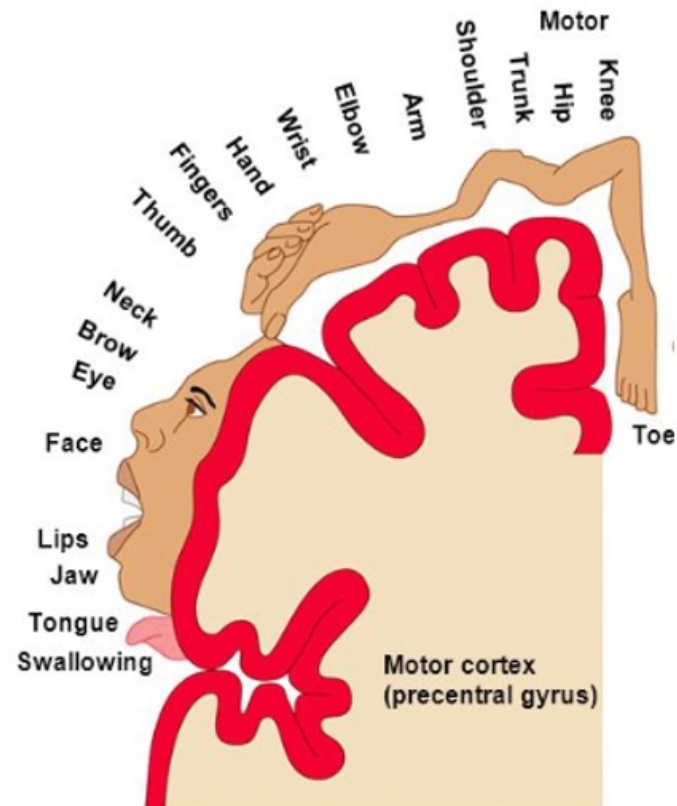


Motor Action Potential Propagation



Motor Homunculus

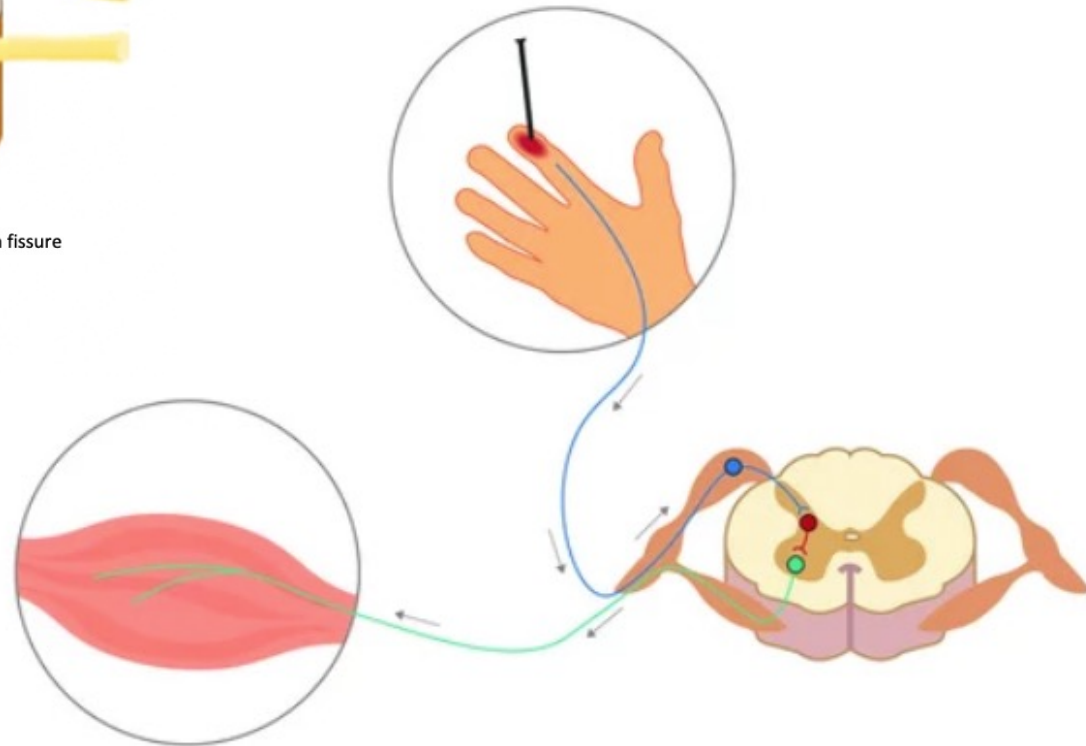
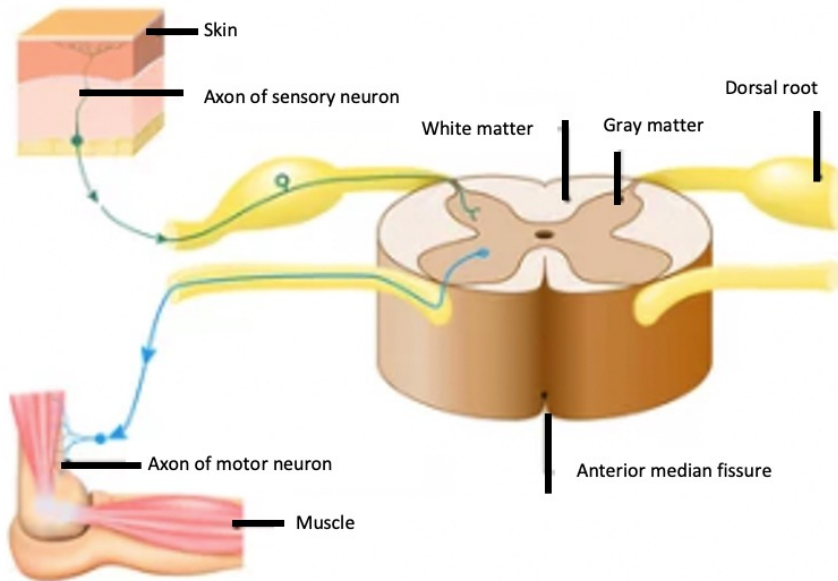
- A cartoon representation of the motor homunculus arranged adjacent to the cortical region in which the processing takes place.



Integration of Information

- Reflex
 - Fast, involuntary, unplanned sequence of actions
 - Occurs in response to stimulus
- Classification
 - Complexity – monosynaptic or polysynaptic
 - Development – innate or learned
 - Effector – somatic or autonomic
 - Integration center – spinal or cranial

Monosynaptic X Polysynaptic



A Reflex Arc

- Step 1: sensory receptor
- Step 2: sensory neuron
- Step 3: integration center
- Step 4: motor neuron
- Step 5: effector

