Neurophysiology of The Nervous System

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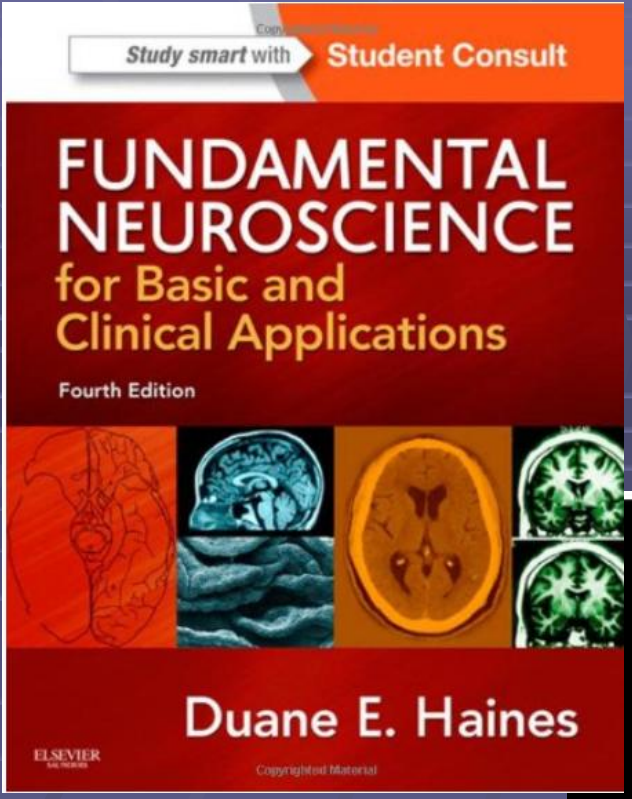
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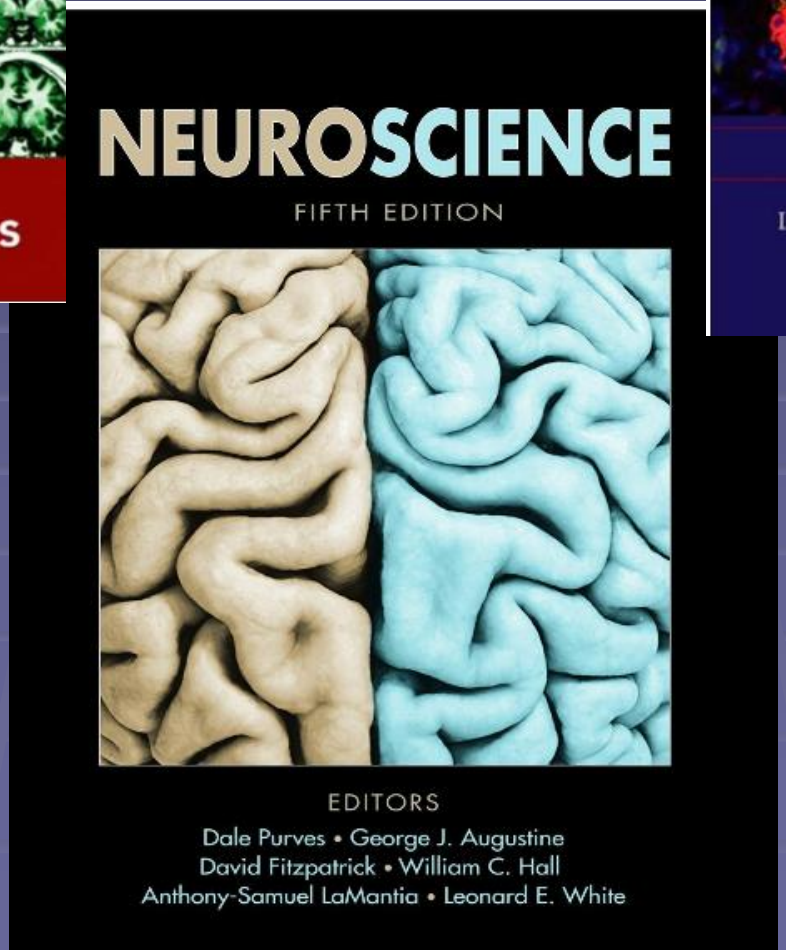
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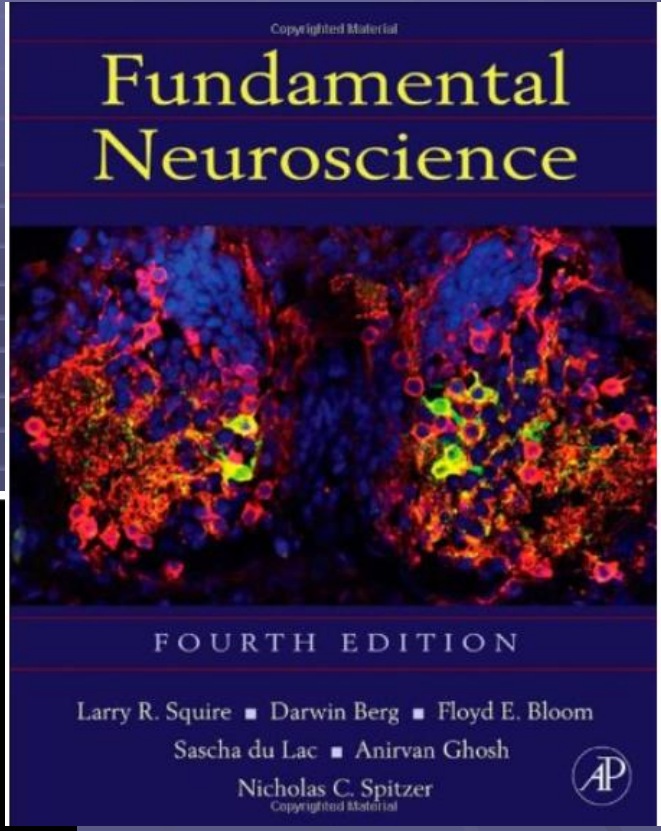
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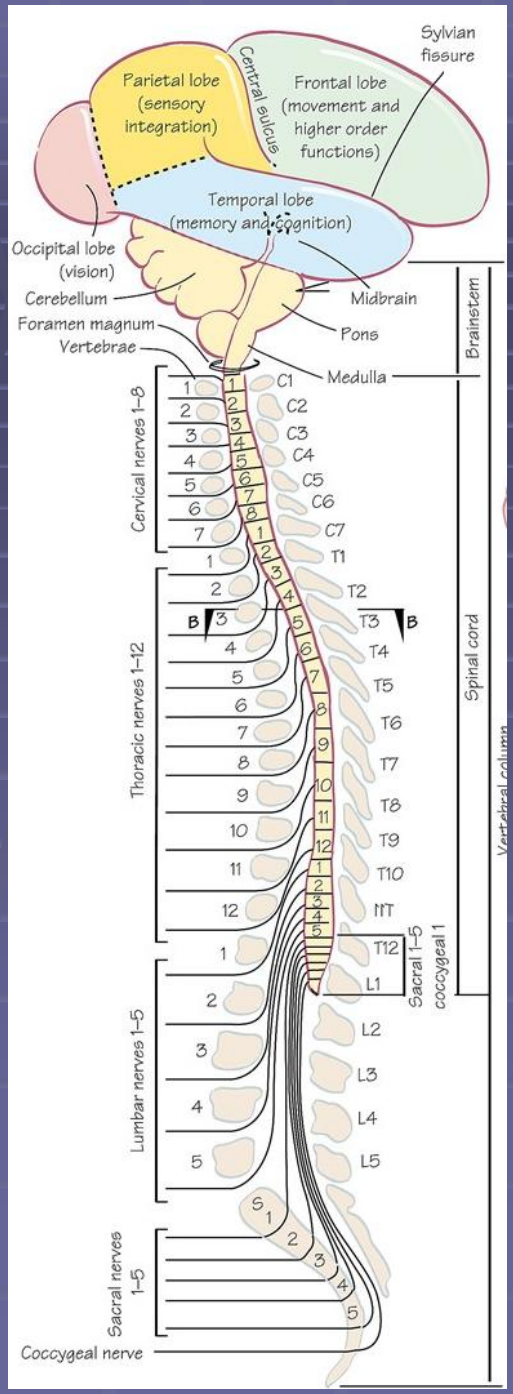
Sylvian fissure
Parietal lobe (sensory integration)
Central sulcus
Frontal lobe (movement and higher order functions)
Temporal lobe (memory and cognition)
Occipital lobe (vision)
Cerebellum
Foramen magnum
Vertebrae
Midbrain
Pons
Medulla
Brainstem
Spinal cord
Vertebral column
Cervical nerves 1–8
Thoracic nerves 1–12
Lumbar nerves 1–5
Sacral nerves 1–5
Coccygeal nerve
Sacral 1–5
Coccygeal 1
C1
C2
C3
C4
C5
C6
C7
T1
T2
T3
T4
T5
T6
T7
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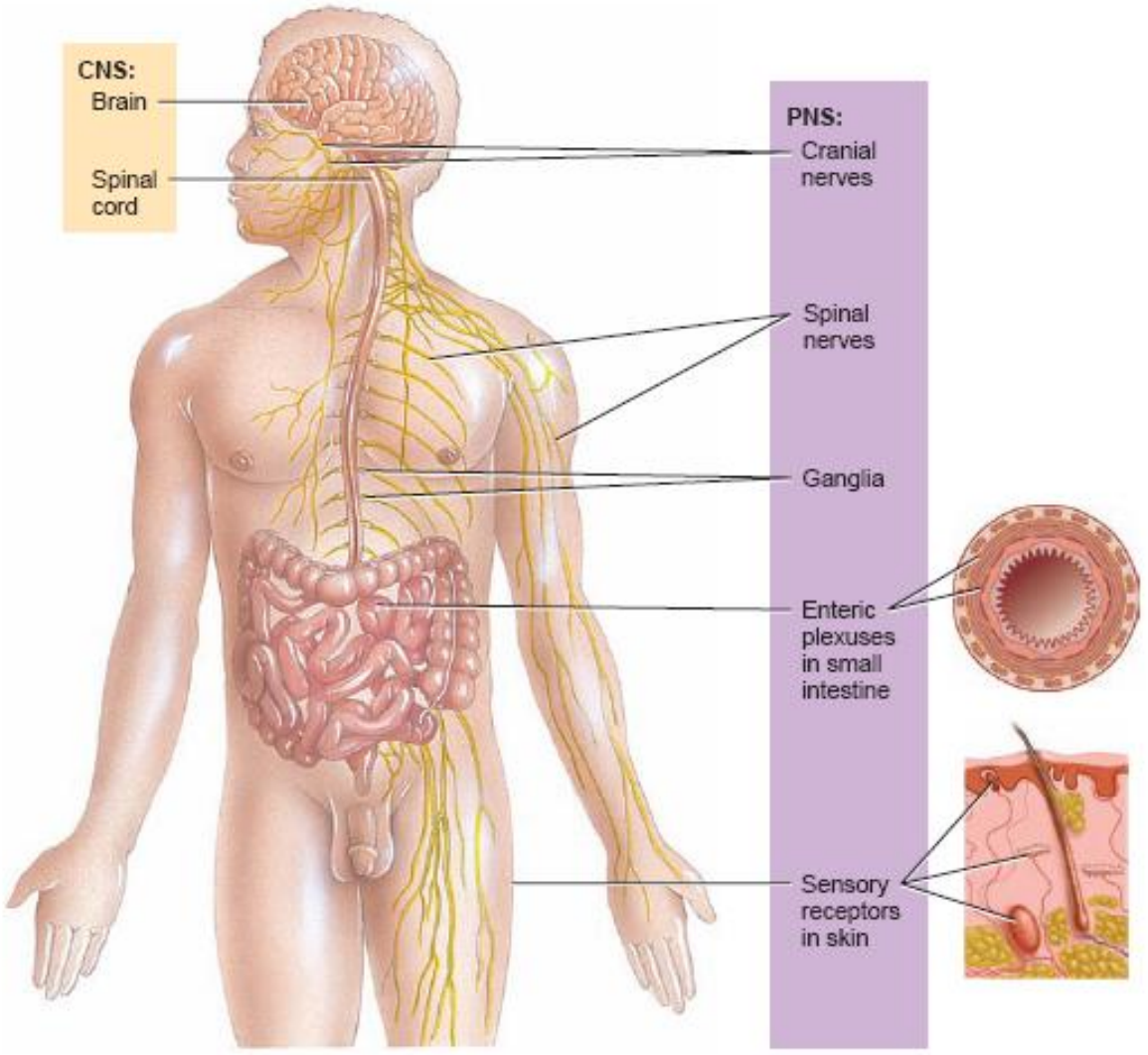
Organization of the nervous system



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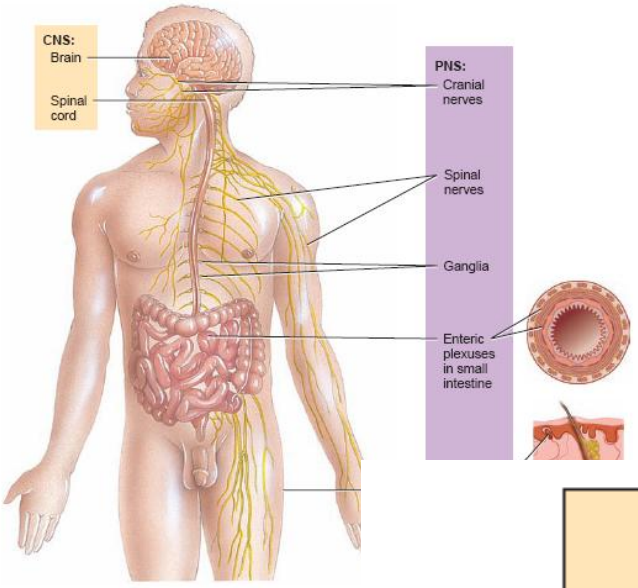
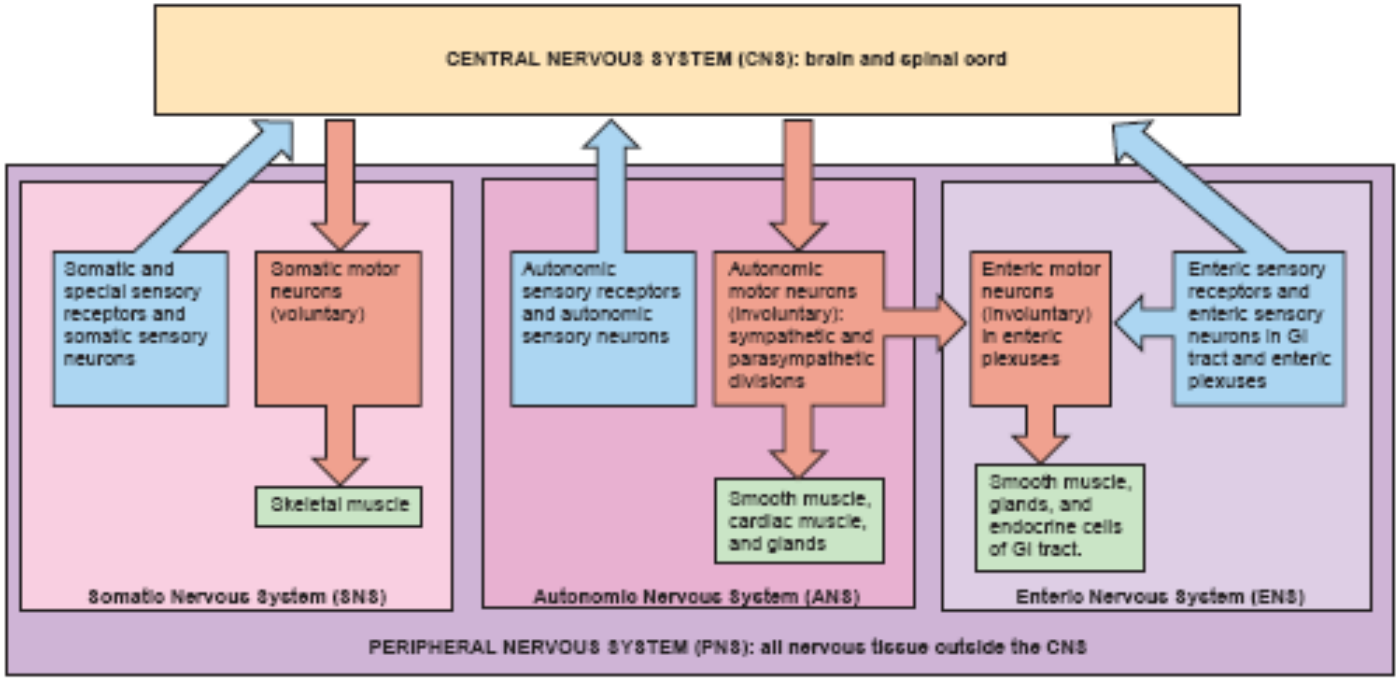
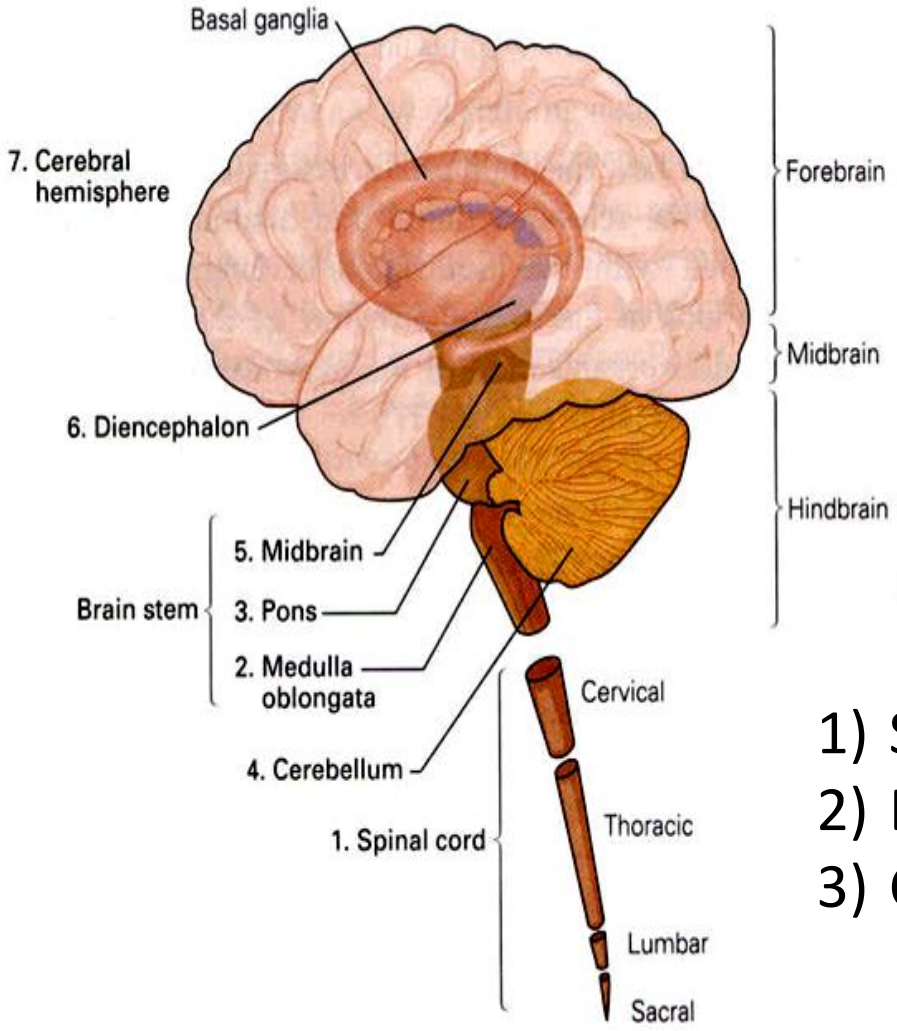




Levels of the CNS



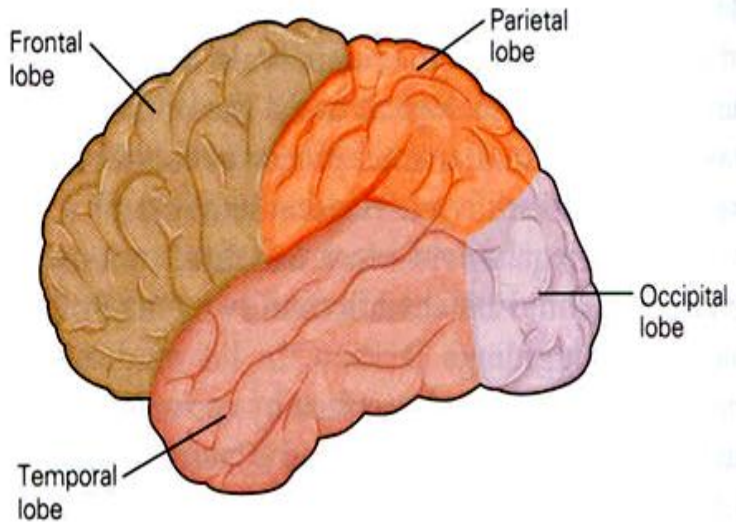


Figure 1-2B The four lobes of the cerebral cortex.

1) Spinal cord
2) Brain stem and sub cortical
3) Cerebral cortex

3 Major Levels of CNS Function

- The spinal cord level.
  - more than just a conduit for signals from periphery of body to brain and vice versa.
  - cord contains:
    - walking circuits.
    - reflexes circuits.

The brain stem and subcortical

- Contains:
  - medulla, pons, mesencephalon, hypothalamus, thalamus, cerebellum and basal ganglia.
- Controls subconscious body activities:
  - arterial pressure, respiration, equilibrium, feeding reflexes, emotional patterns.

The Higher Brain or Cortical Level

- Higher order functions : language, thoughts and personality
- Large memory storehouse.
- Each portion of the nervous system performs specific functions, but it is the cortex that opens the world up for one's mind.

Organization of the Nervous System

- Sensory Division
  - tactile, visual, auditory, olfactory.
- Motor Division
  - respond to and move about in our environment.
- Integrative Division
  - process information, creation of memory.

Somatosensory Axis of the Nervous System

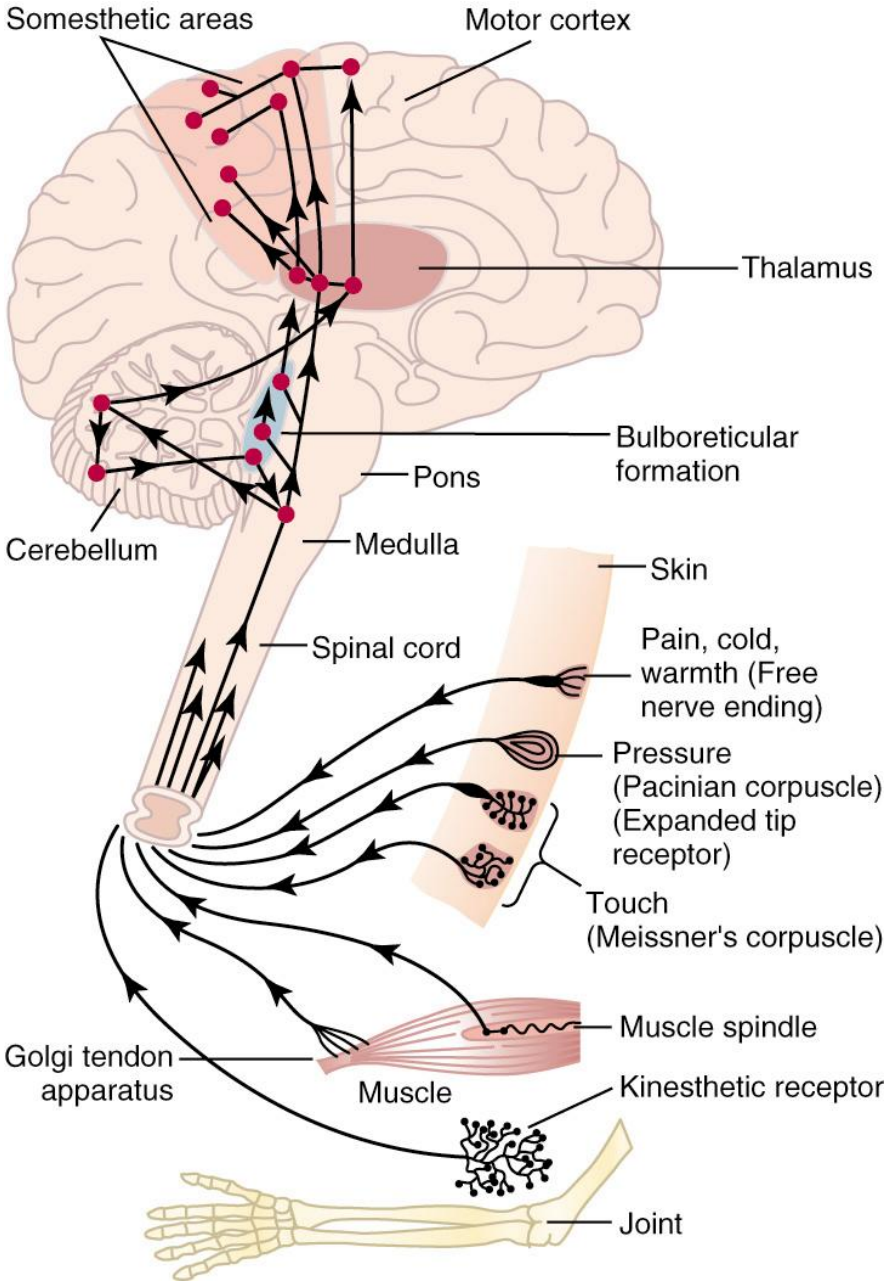


Figure 45-2

Skeletal Motor Nerve Axis of the Nervous System

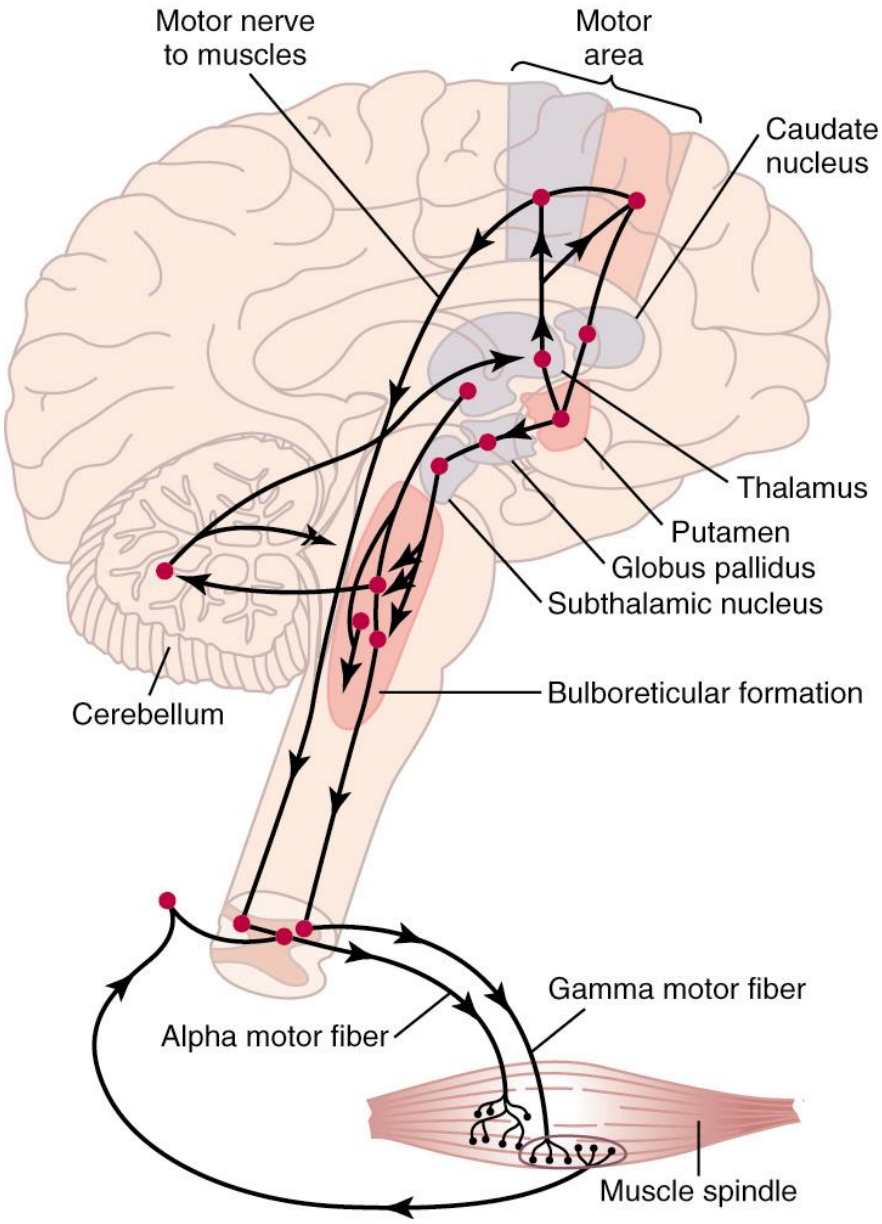
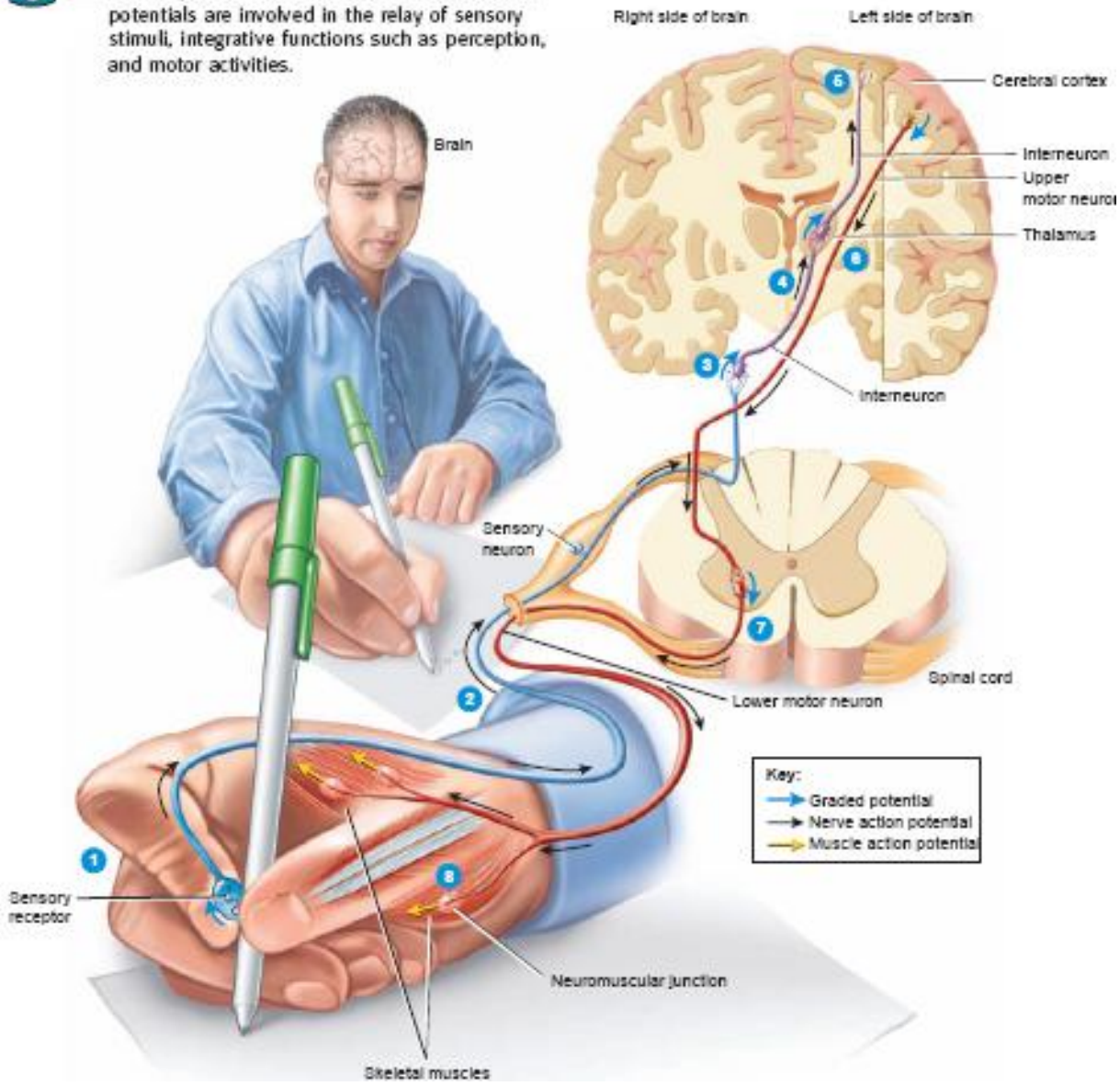


Figure 45-3

Figure 12.11 Overview of nervous system functions.

Graded potentials and nerve and muscle action potentials are involved in the relay of sensory stimuli, integrative functions such as perception, and motor activities.



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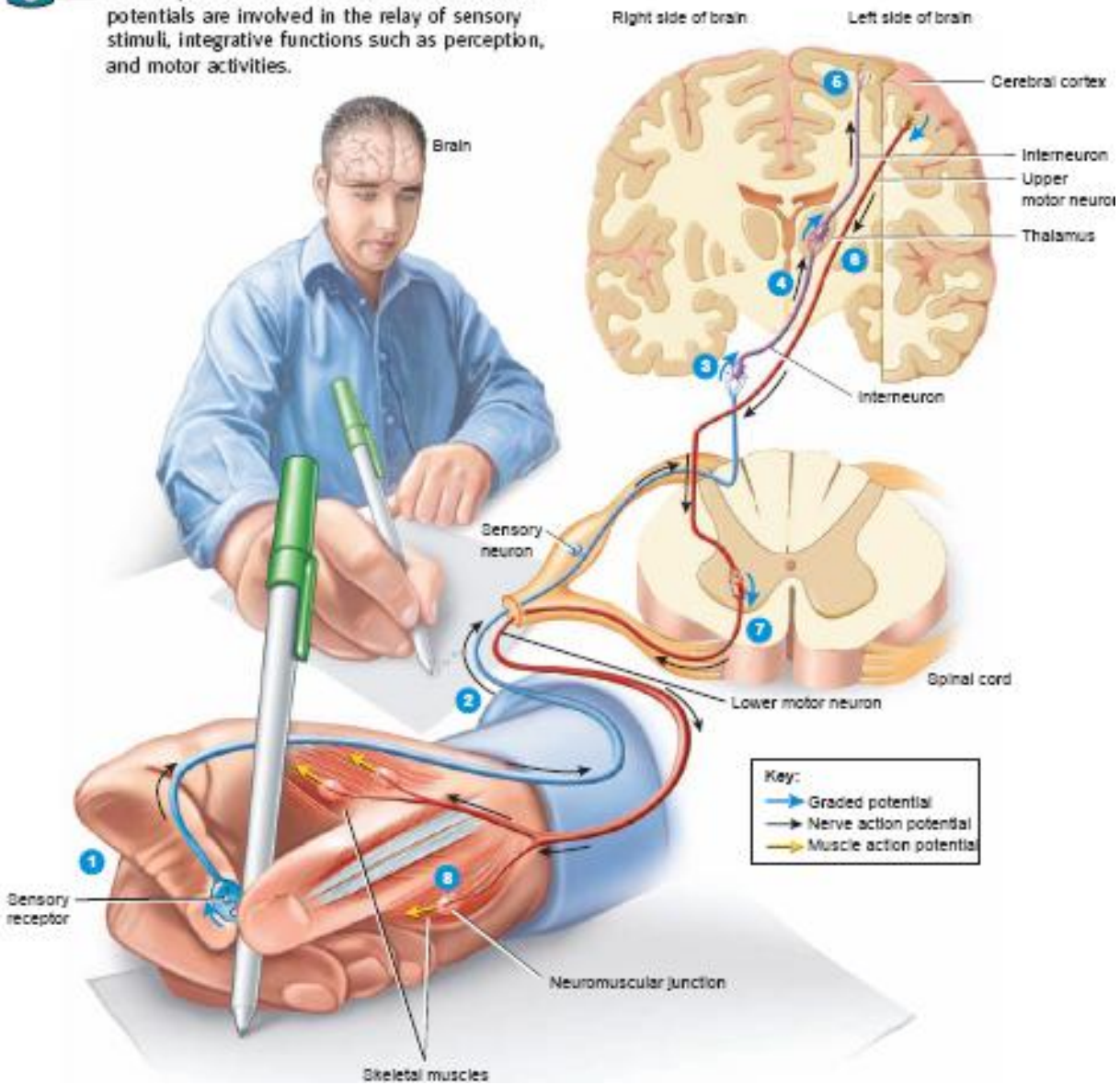

Terminology:

Afferent

VS

Efferent

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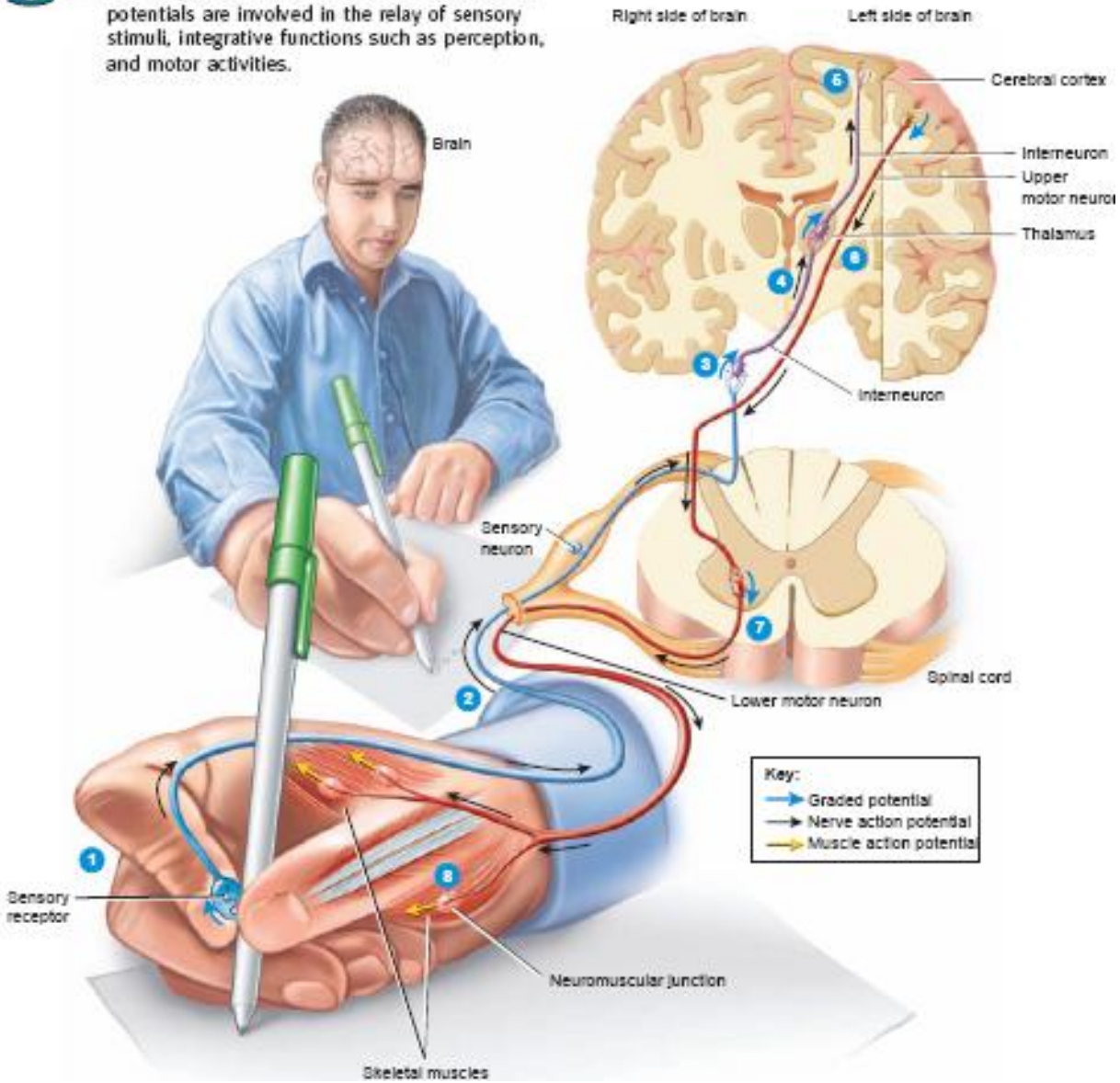
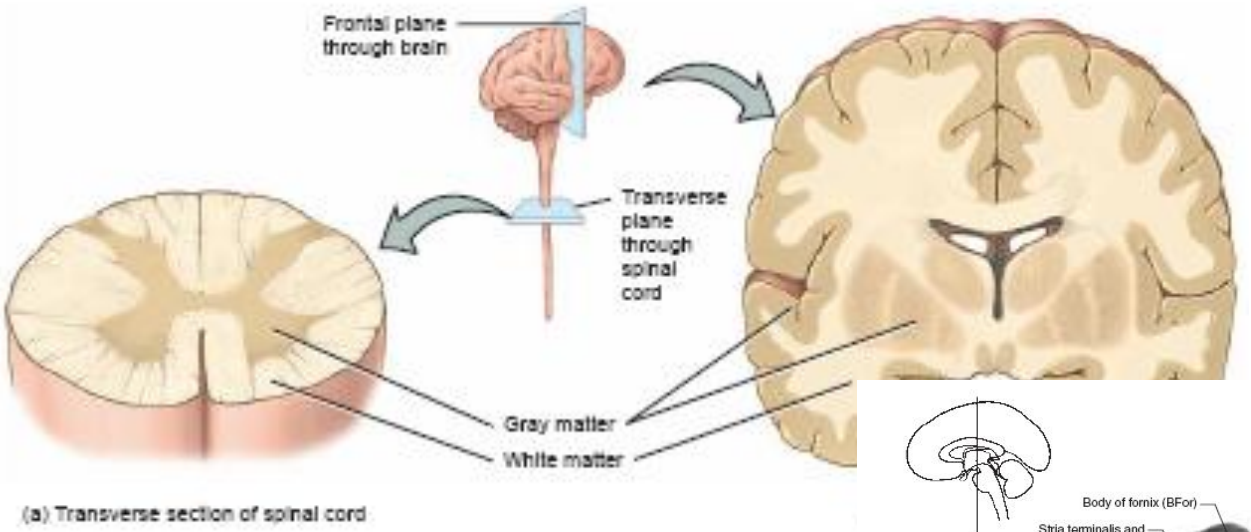


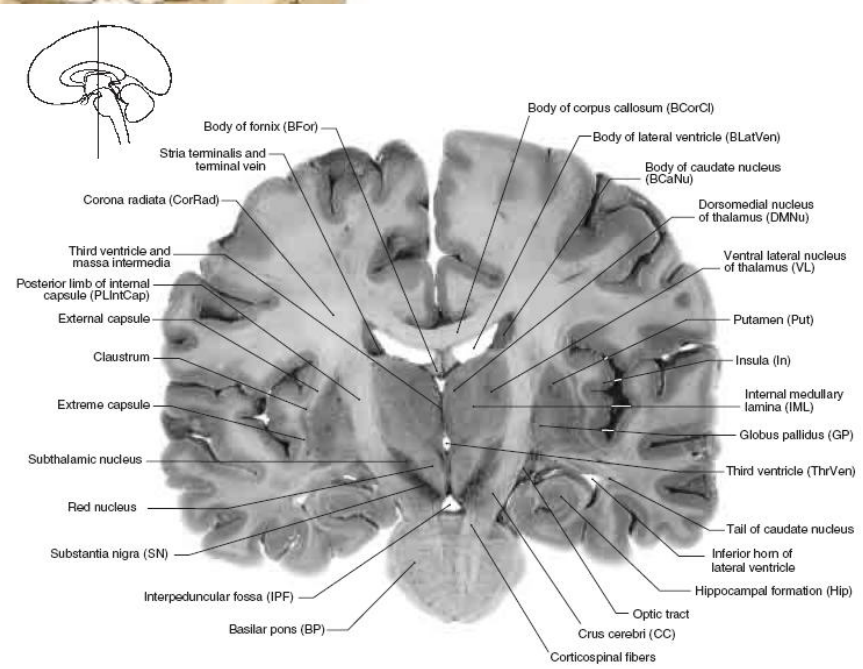
Terminology:

1st order , 2nd order and 3rd order neurons

Nervous tissue

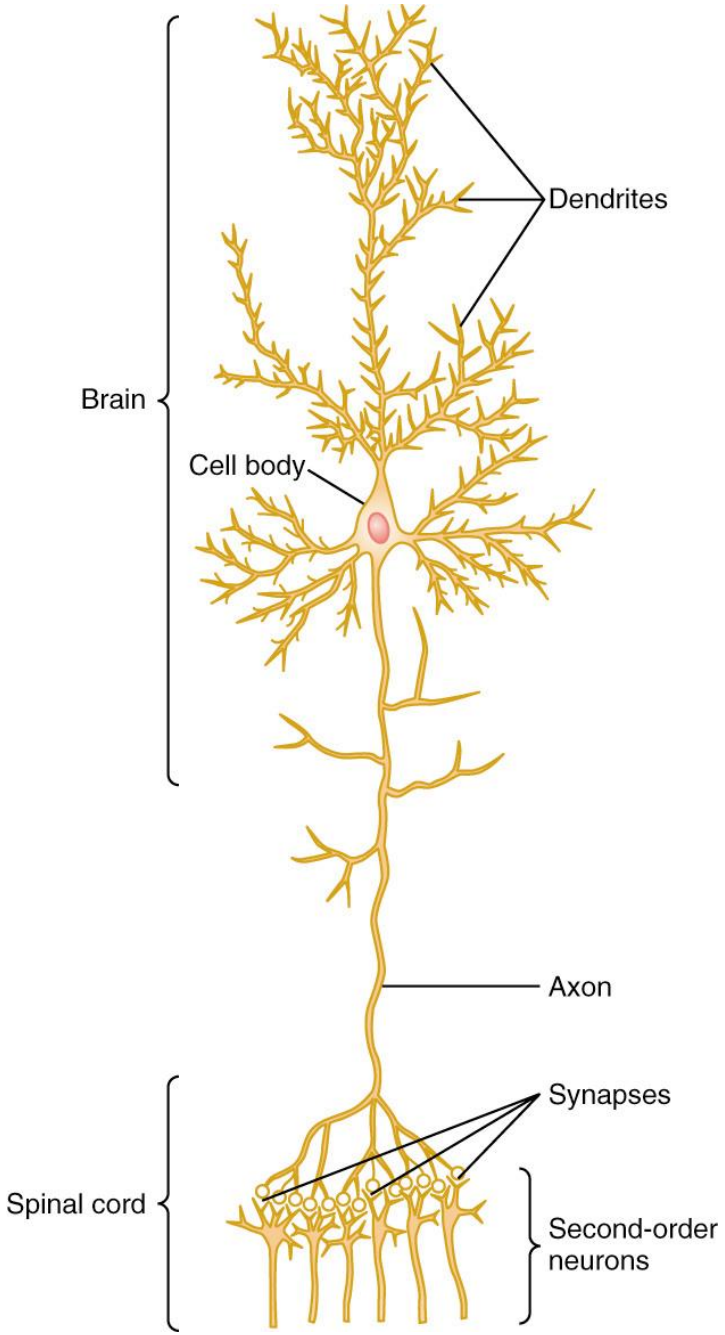


(a) Transverse section of spinal cord



Gray matter : neuron cells
White natter: myelinated axons

Neuron Structure



Types of neurons