Neuroanatomy: Systems, Pathways and Tracts

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Basal Ganglia

- Caudate
- Putamen
- Globus pallidus
- Subthalamic nuclei
- Substantia nigra
  - pars compacta
  - Pars reticulata
- (Nucleas accumbens)
- (Ventral pallidum)

Neostriatum or striatum

- Caudate + Putamen
  - Receives all input to BG
  - Most cortical input is excitatory (glutamate)
  - Output is GABA
Lentiform

- Globus Pallidus + Putamen

Connections

- Commisure
- Faciculus
### Limbic
- Homeostasis
- Olfaction
- Memory
- Emotion

### Limbic System
- Olfaction and regulation of emotions, memory, appetite drives, and autonomic and neuroendocrine control
- These areas are interconnected by a variety of pathways, including the **fornix**- connecting the hippocampal formation to the hypothalamus and septal nuclei
### Limbic Structures
- Medial and anterior temporal lobes
- Anterior insula
- Inferior medial frontal lobes
- Hippocampal formation
- Basal ganglia

### Sensory
- Posterior Column pathway - proprioception, vibratory, fine touch
- Anteriolateral - pain, temperature, and crude touch

### Sensory Tract

### Spine: Everyone should get one
Motor Neurons

- Upper motor neurons
  - From cortex to spinal cord or brainstem
- Lower motor neuron
  - Out of CNS via anterior spinal roots (cranial nerves) to muscles in periphery

Crossover

- Medulla/spinal cord junction
- 85% of motor fibers cross over
- Contralateral/ipsalateral

Motor System (medial)

- Anterior Corticospinal tract
- Vestibulospinal tract
- Reticulospinal tract
- Tectospinal tract

Corticospinal

- Major motor tract
- Most important pathway - pyramidal tract
- Voluntary movement
- From cortex to anterior horn cells in spinal cord
Internal Capsule

- Corticospinal/corticobulbar fibers form part of it
- From cortex to brainstem = corticobulbar

Rubrospinal Tract

- Small, unclear clinically
- Rubrospinal tract decussates in the ventral tegmentum at the level of the midbrain to the red nucleus
- A portion of the anterior corticospinal tract decussates at the level of the cervical spinal cord, just below the Pyramid

Rubrospinal

- May play role in decorticate posturing

A. Extension posturing (decerebrate rigidity)

B. Abnormal flexion (decorticate rigidity)