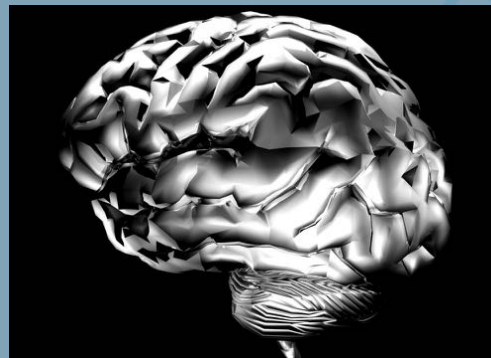


Neuroanatomy II: Systems, Pathways and Tracts

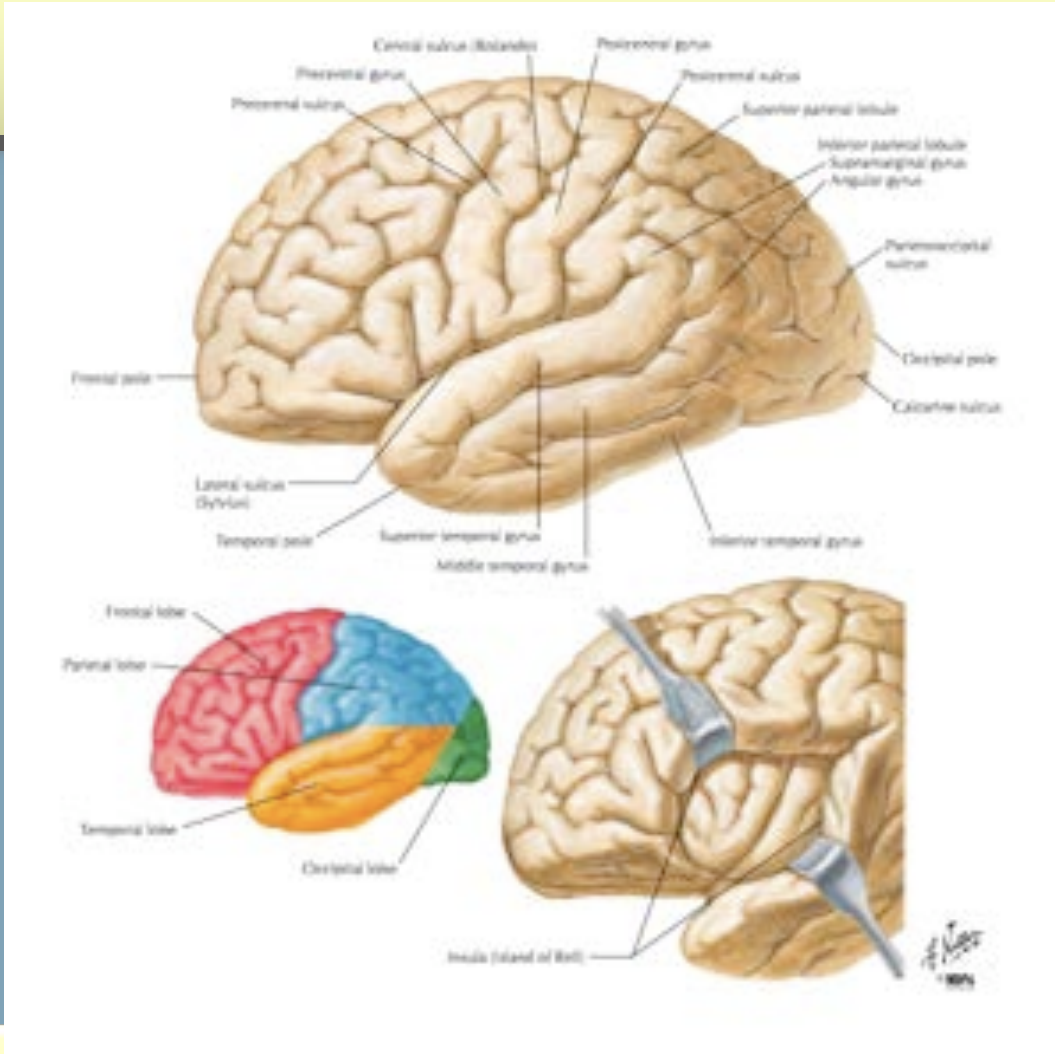


Marc Norman, Ph.D., ABPP
Amanda Gooding, Ph.D., ABPP

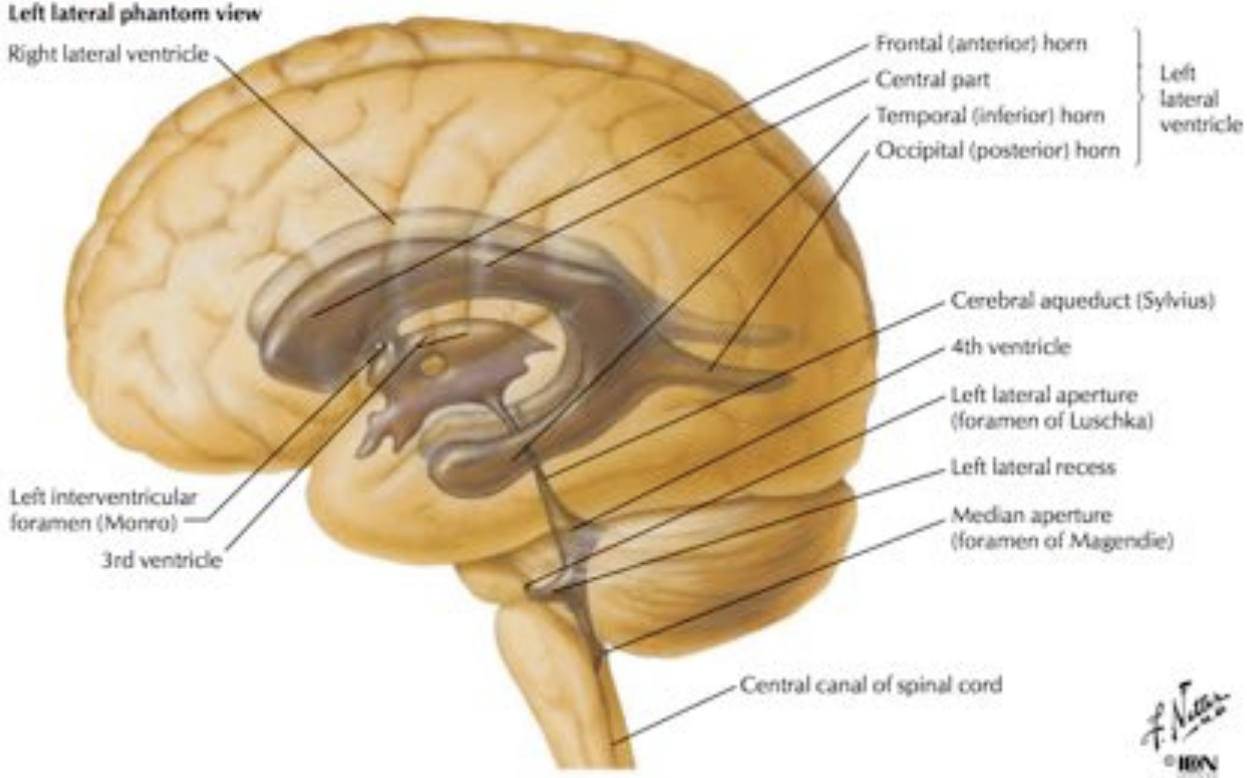
Department of Psychiatry
Neuropsychology Clinical Training Seminar (NCTS)

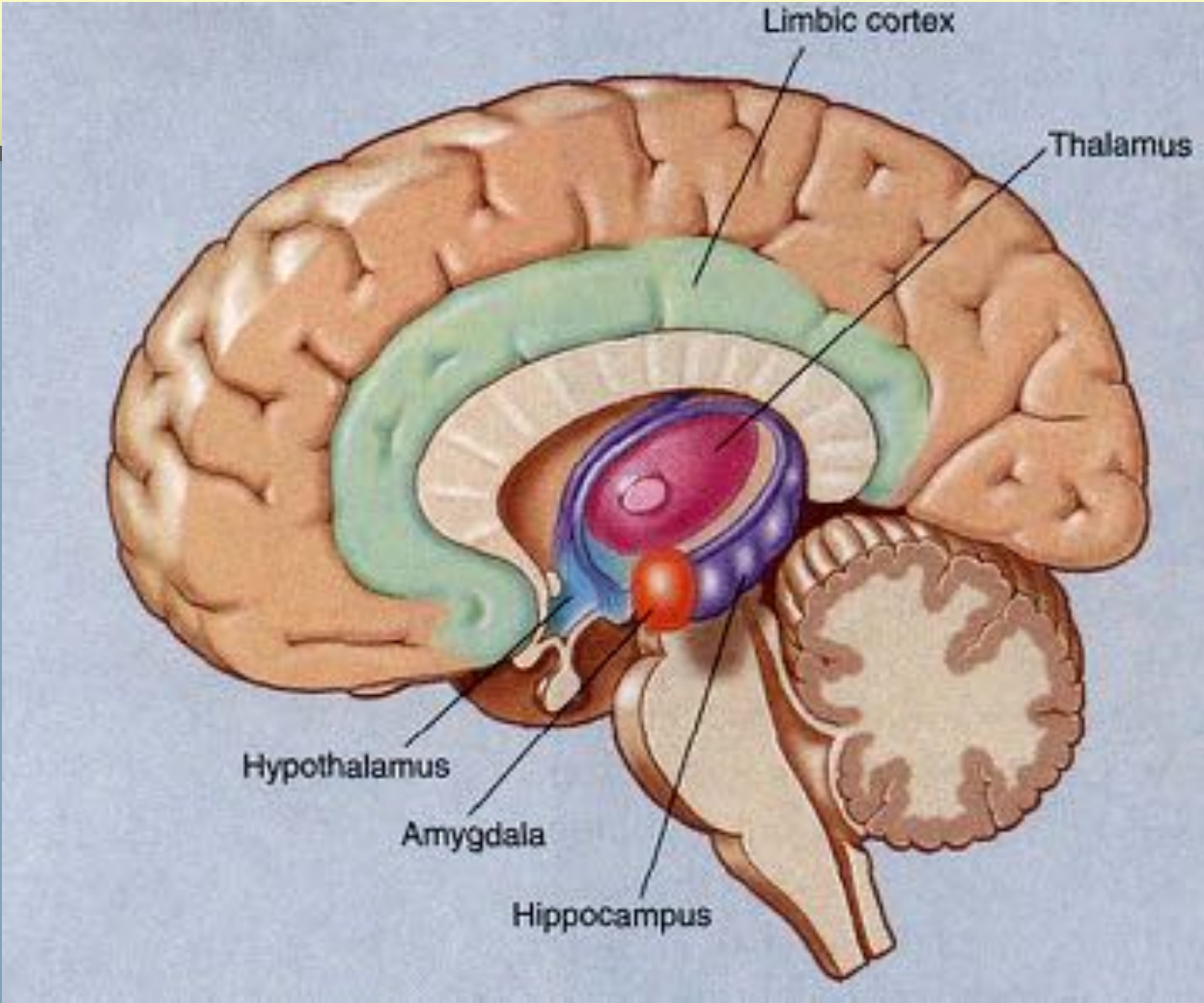












Neostriatum or striatum

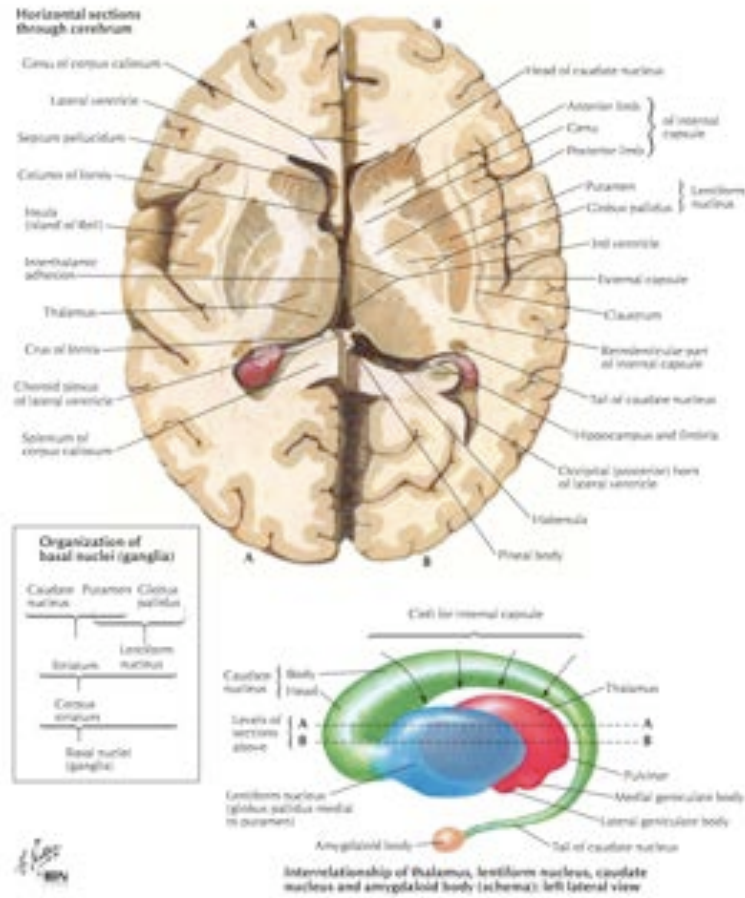
- Caudate + Putamen
 - Receives all input to BG
 - Most cortical input is excitatory (glutamate)
 - Output is GABA

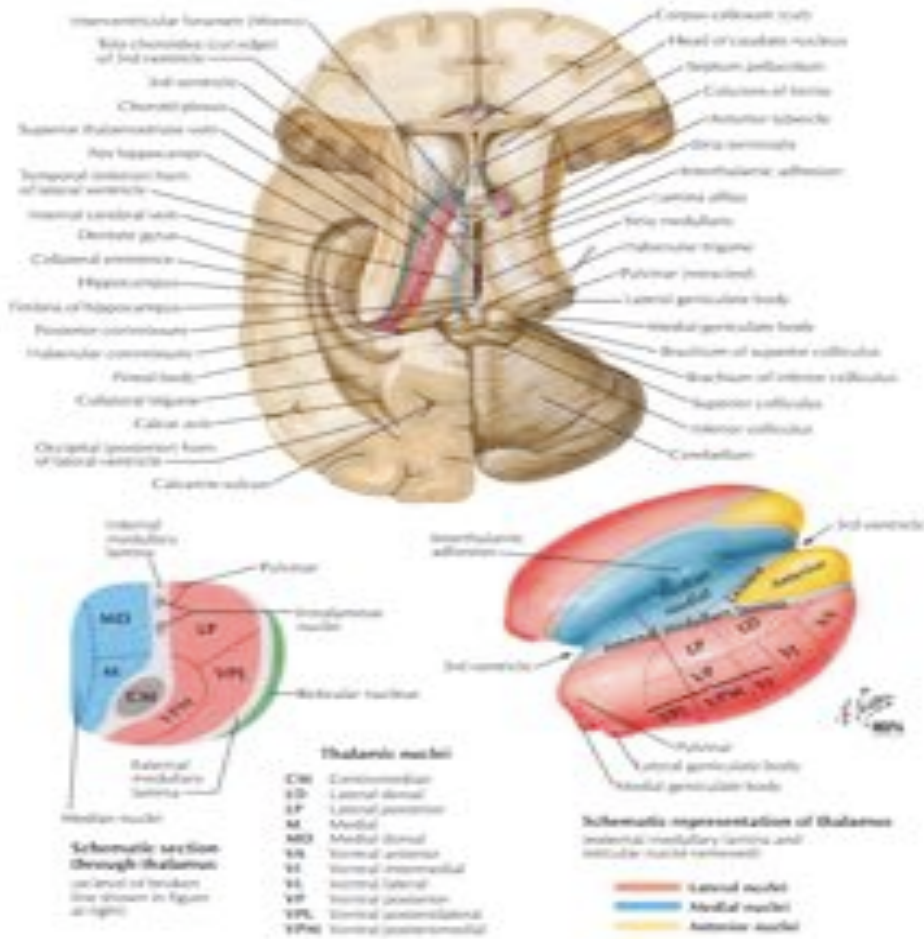


Lentiform

- Globus Pallidus + Putamen

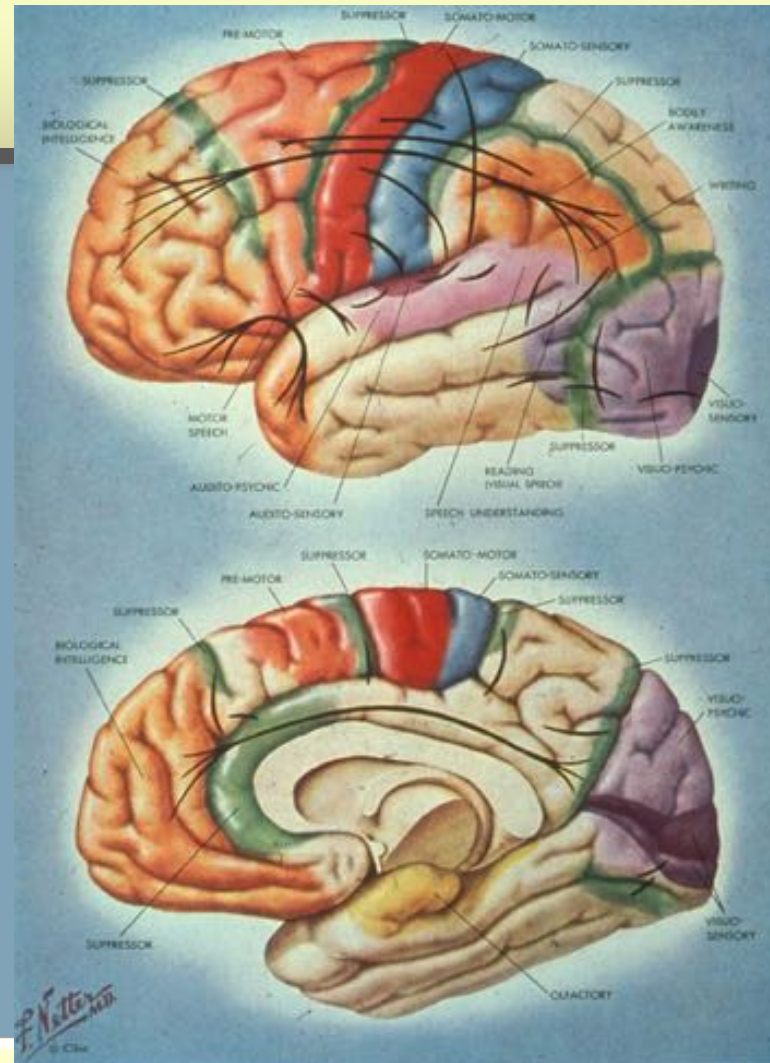






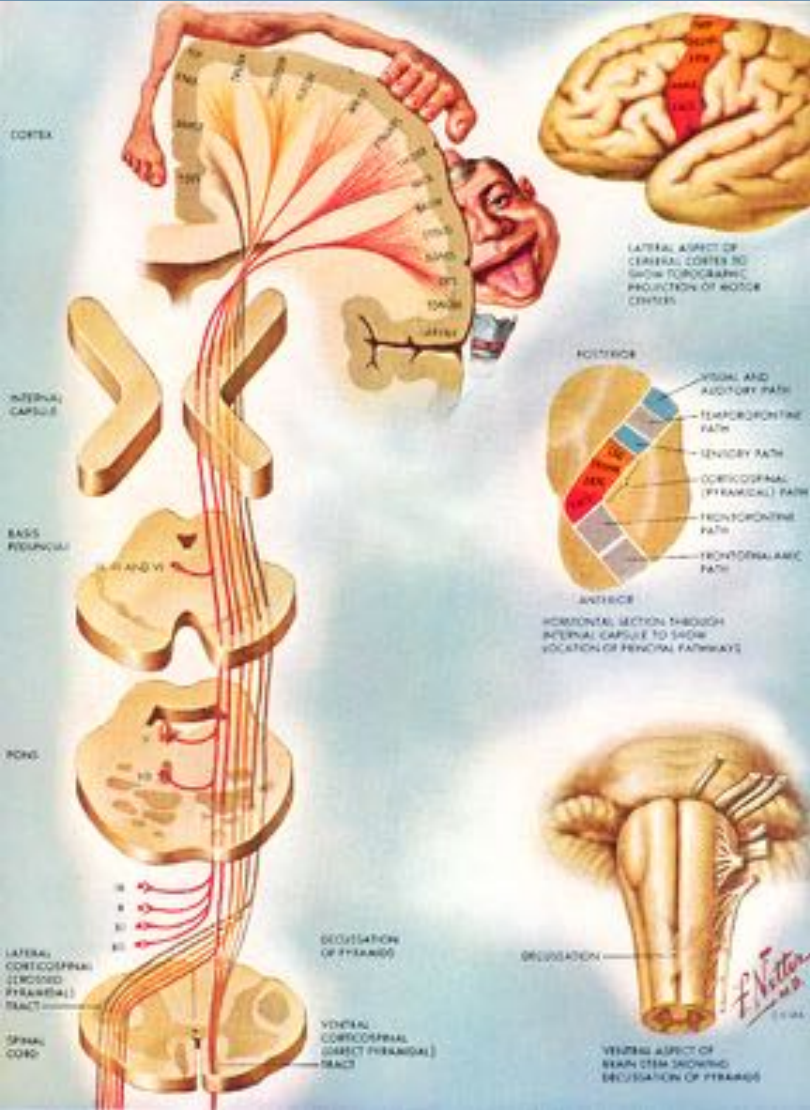
Connections

- Commisure
- Fasciculus



San Diego Health





Limbic

- Homeostasis
- Olfaction
- Memory
- Emotion



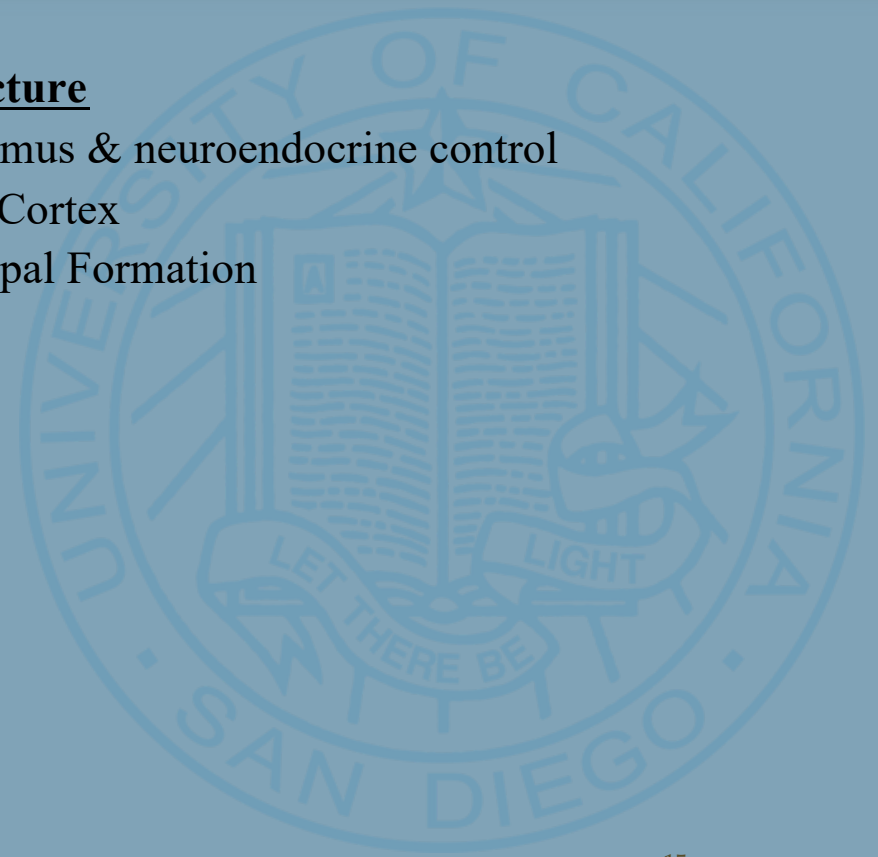
Getting' Limbic

- **Limbic Function**

- Homeostasis, autonomic
- Olfaction
- Memory
- Emotions and drives

- **Key Structure**

- Hypothalamus & neuroendocrine control
- Olfactory Cortex
- Hippocampal Formation
- Amygdala



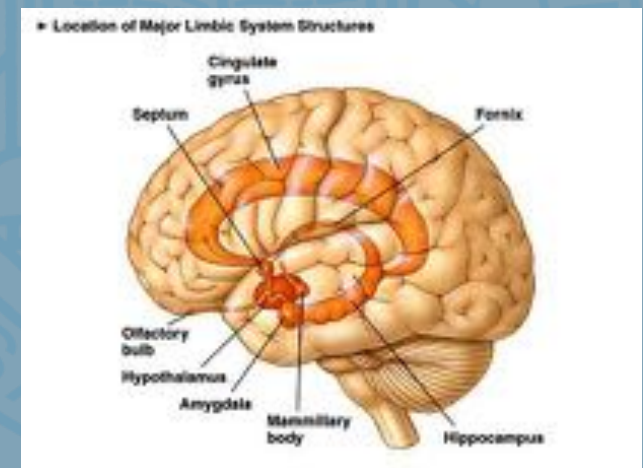
Limbic System

- 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
- Cingulate gyri
- Amygdala
- Medial thalamic nuclei
- Hypothalamus
- Septal area
- Brainstem

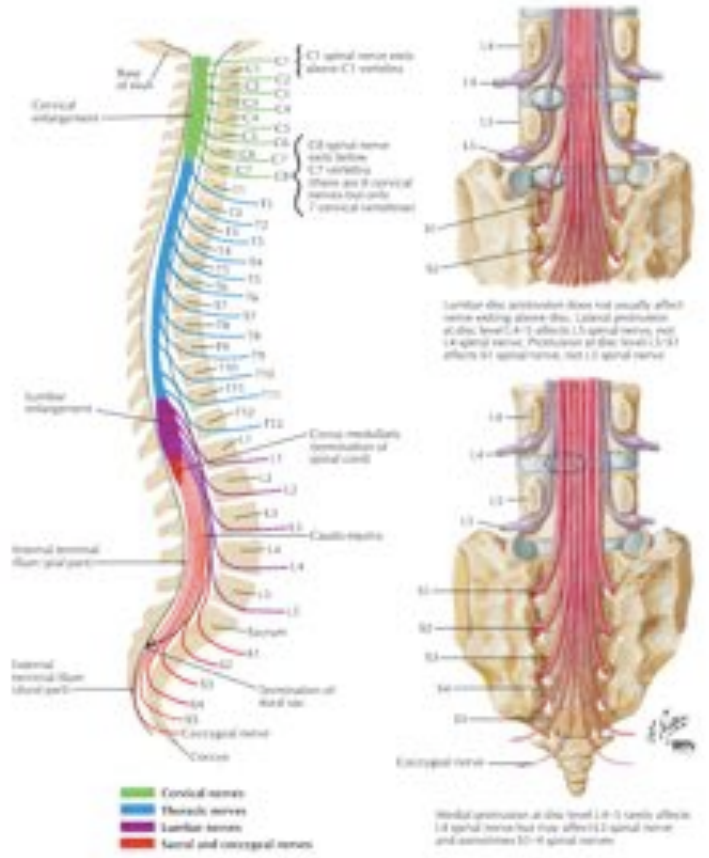


Sensory

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



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/ipsilateral



Motor System (medial)

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

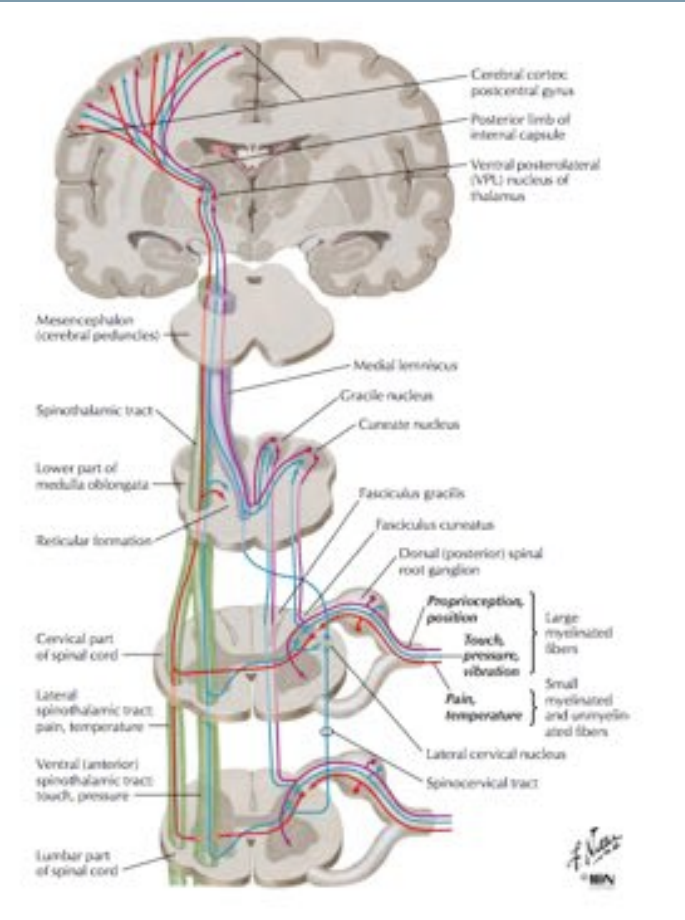


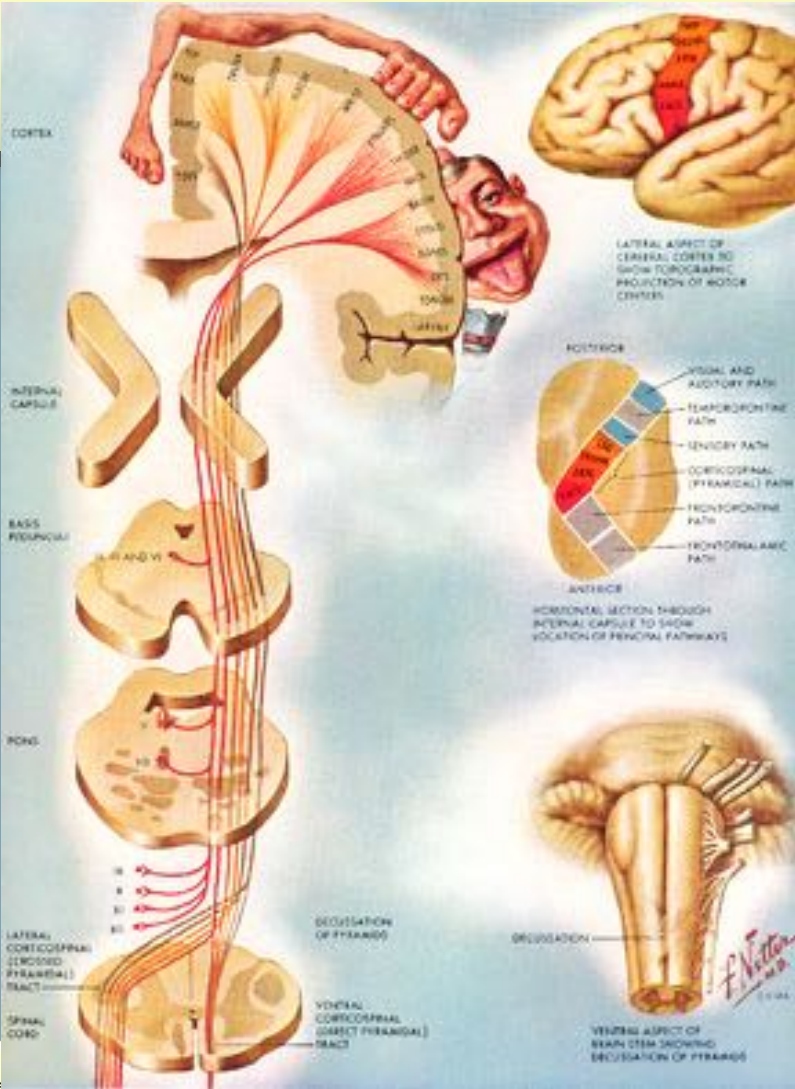
Corticospinal

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



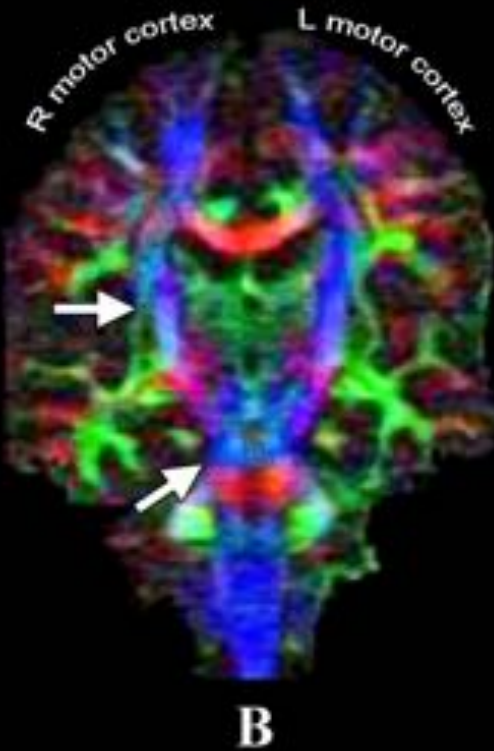
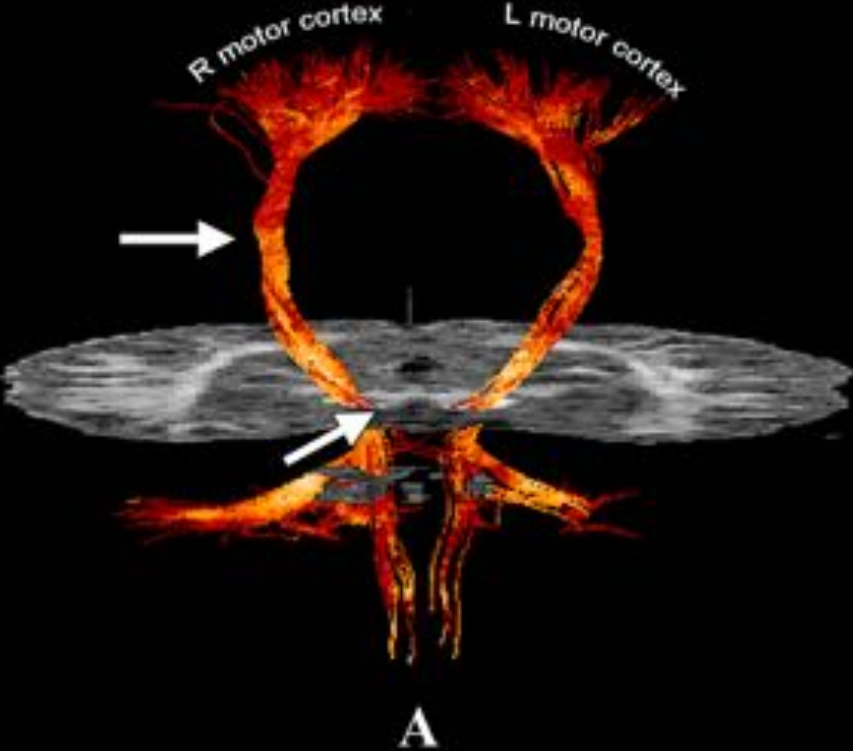
Corticospinal Tract

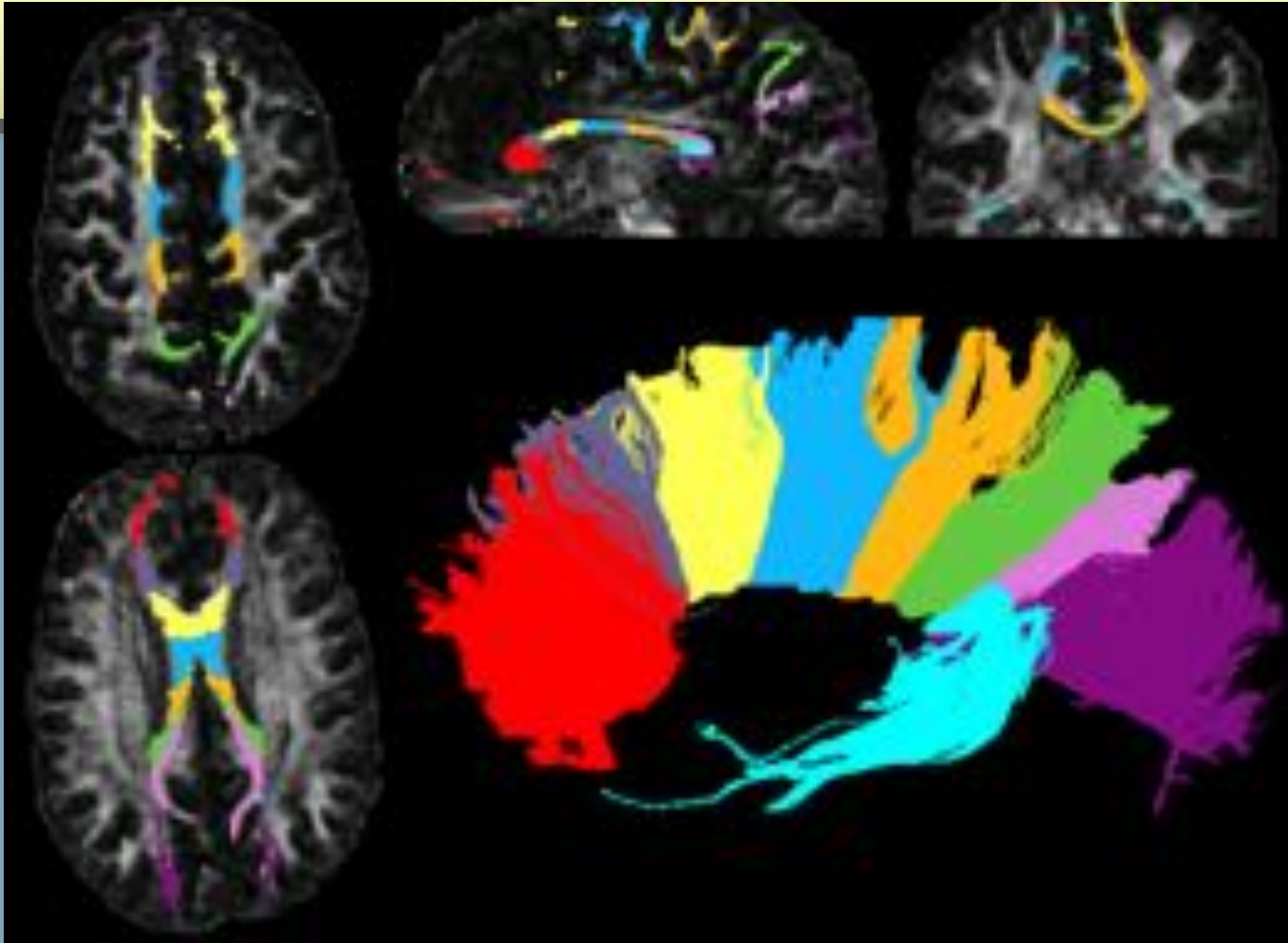




Tractography

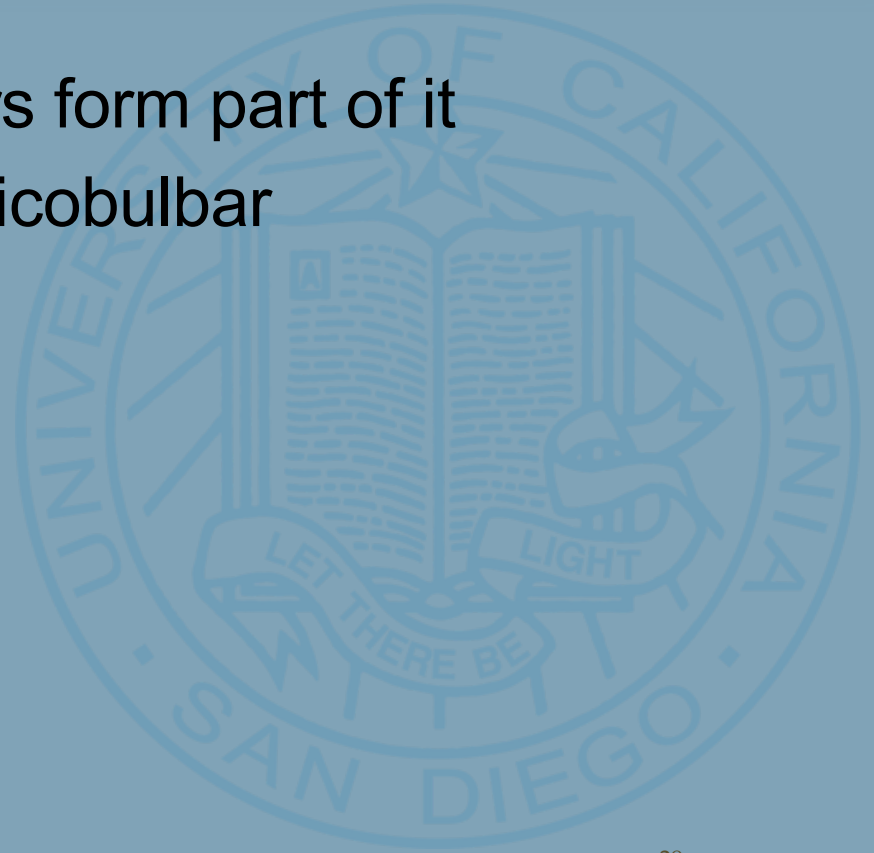
DTI Scan





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)

The End is Here

UC San Diego Health

- Repent, for the time is Nigh

