

08 - Thalamus

Thalamus

© SPMM Course □ They include striatum made of the caudate nucleus and putamen and pallidum made of globus pallidus. Putamen and globus pallidus are sometimes called lenticular/lentiform nucleus. □ The subthalamic nuclei and the substantia nigra are both functionally related to the basal ganglia but are not considered to be a part of this structure. □ Basal ganglia receive crucial inputs from glutamatergic corticostriatal projection. Alexander described five important circuits involving the basal ganglia. These are □ Motor circuit □ Oculomotor circuit □ Dorsolateral prefrontal circuit (executive) □ Anterior cingulate circuit (motivation) □ Lateral orbitofrontal circuit (social intelligence)

Disorder Nature of basal ganglia dysfunction OCD Volumetric changes and higher blood flow to the caudate nuclei. Increased caudate metabolism in untreated subjects reduces after effective treatment. Tourette's syndrome Striatal dopaminergic dysfunction Huntington chorea Degeneration of the striatum (mainly caudate nucleus) & selective loss of GABAergic neurons Wilson disease Copper deposits in the lenticular nuclei CO poisoning Acute bilateral anoxic damage to basal ganglia Hemiballismus Subthalamic nucleus damage (especially infarction) Parkinsonism Depigmentation of Substantia Nigra; Lewy bodies are seen. Striatal overactivity associated with bradykinesia Fahr's disease Progressive calcium deposition in the basal ganglia. (early onset cases present with schizophreniform psychoses and catatonia; later onset cases exhibit dementia and choreoathetosis) Thalamus □ A large oval mass of grey matter nuclei in the subcortical region, relaying all types of sensory information onto cortex (except olfaction). □ It also relays cerebellar and basal ganglia inputs to the cerebral cortex. □ The thalamus is said to play a crucial role of filtering sensory information in preparation for cortical processing. □ The anterior thalamus is a part of the limbic system. It receives the mamillothalamic tract and fornix and connects to the cingulate cortex. Thus, it relays information from hypothalamus and hippocampus onto the frontal cortex. □ Pulvinar is associated with visual attention. Sleep spindles are generated in the reticular nucleus of the thalamus.

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