Week 8 Handout – Chapter 9

The premotor cortex plans movements

There is aniticipatory activity, the so-called "readiness" potential, in the premotor cortex that occurs before the execution of an action

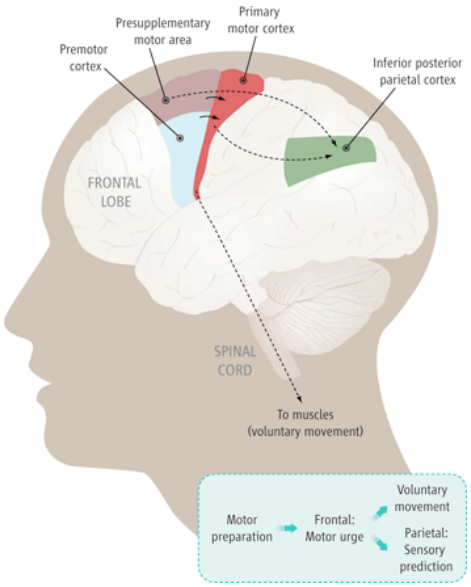
_____ – Loss of awareness:

Patients with lesions to premotor areas and the primary motor cortex (M1) deny their inability to move

In general

The _____ (_____) is especially important for the production of cued movements

The _____ (_____) is crucial for generating movements in the absence of explicit sensory cues



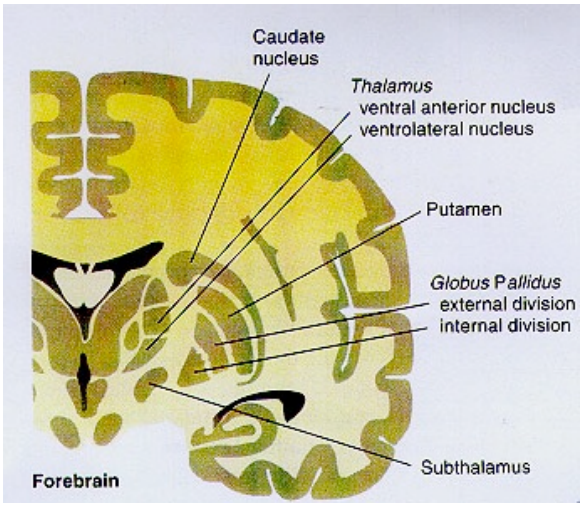
If the SMA is lesioned, an animal can no longer perform _____movements are

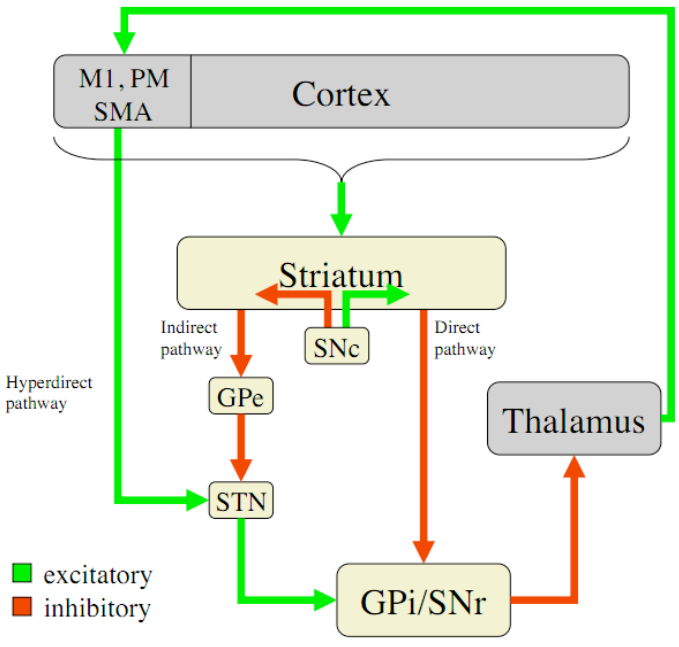
Parietal Cortex – Distinct regions in the parietal cortex are dedicated to _____ and _____ arm movements. Important for integrating information about the location of the eye, hand, and target

Lesions in the parietal lobe can lead to: _____– a disruption in both reaching and saccades

Introduction to the Basal Ganglia

- serves an important gating function
- inhibits inappropriate movements; and,
- initiates appropriate movements





Regions/Terminology

Striatum = Caudate + Putamen
SNc = Substantia nigra pars compacta
SNr = Substantia nigra pars reticulata
STN = Subthalamic Nucleus
GPe = Globus Pallidus external segment
GPi = Globus Pallidus internal segment

Two Pathways to the Thalamus

Direct Pathway

SNc releases _____ → onto

_____ receptors of neurons in the striatum; _____ neurons release GABA →

Globus paladus internal segment (GPi) and the SNr; release _____→ Thalamus

Overall effect:

- Release of (inhibition/excitation) of the Thalamus
- Net activation of the Thalamus and (inhibition/excitation) of cortical neurons

Indirect Pathway

SNc releases _____→

_____ receptors of striatum; _____ neurons release GABA →

Globus Paladus External Segment (GPe); releases _____ →

Subthalamic Nucleus (STN); releases _____ →

Globus paladus internal segment (GPi) and the SNr; release _____ → Thalamus

Overall effect:

- Net (inhibitory/excitatory) effect on the Thalamus
- Overall (inhibition/excitation) of movement

The **Superior Colliculus** is an important nuclei for _____ movements
It is closely related to the Basal Ganglia via the SNr

Huntington's Disease: (*Hyperkinetic/Hypokinetic) disorder*
Too much movement - patients may exhibit choreiform (dance-like) movements; have trouble (initiating/inhibiting) inappropriate actions

Parkinson's Disease: (*Hyperkinetic/Hypokinetic) disorder*

Have trouble (initiating/inhibiting) movements