The premotor cortex plans movements

There is anticipatory 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

<table>
<thead>
<tr>
<th>Striatum</th>
<th>Caudate + Putamen</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNc</td>
<td>Substantia nigra pars compacta</td>
</tr>
<tr>
<td>SNr</td>
<td>Substantia nigra pars reticulata</td>
</tr>
<tr>
<td>STN</td>
<td>Subthalamic Nucleus</td>
</tr>
<tr>
<td>GPe</td>
<td>Globus Pallidus external segment</td>
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<tr>
<td>GPI</td>
<td>Globus Pallidus internal segment</td>
</tr>
</tbody>
</table>

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/Hypokineti) disorder
Have trouble (initiating/inhibiting) movements