

PYRAMIDAL DAN EXTRAPYRAMIDAL

# GERAK REFLEKS

# GERAK

- DISADARI
- TIDAK DISADARI / REFLEKS

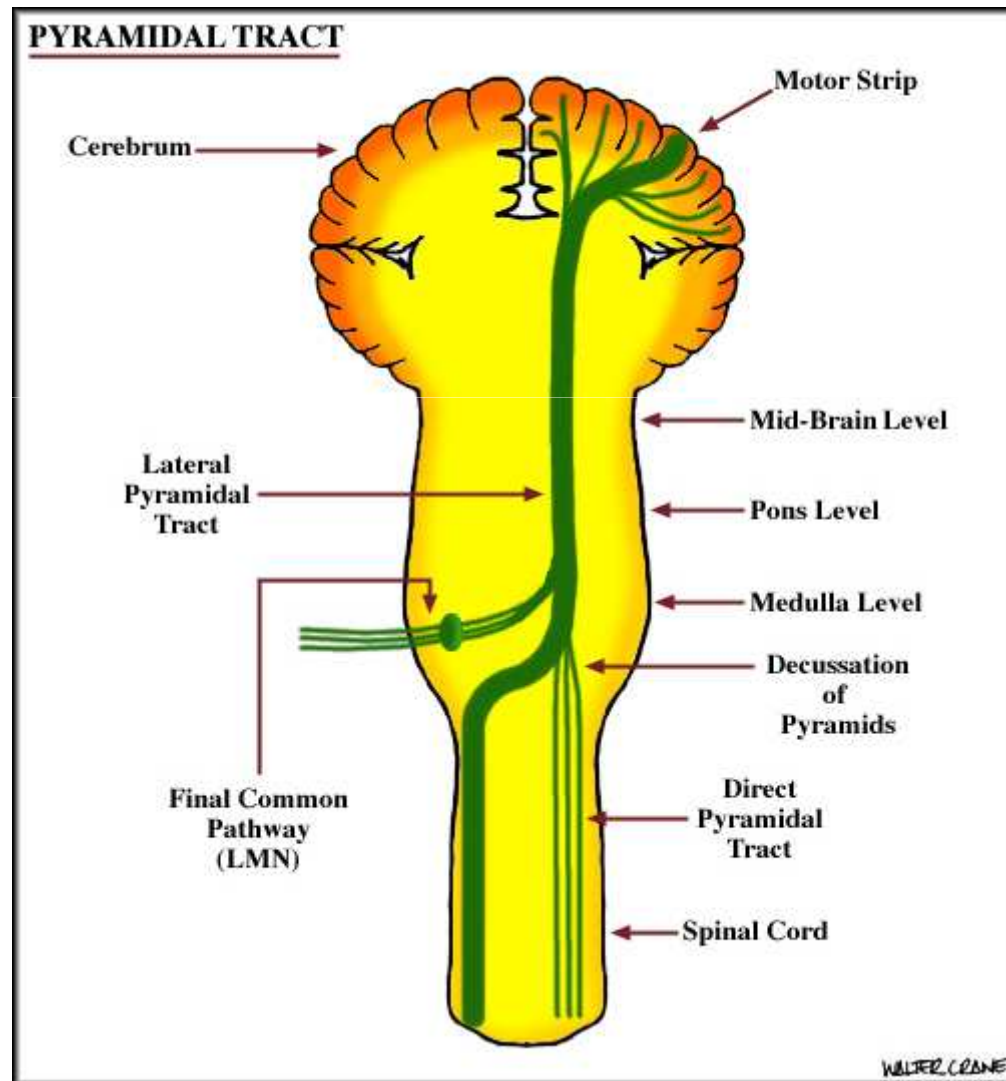
# GERAK DISADARI

- Impuls pada gerakan sadar melalui jalan panjang: yaitu dari reseptor → ke saraf sensori → dibawa ke otak (diolah : berupa tanggapan) → dibawa oleh saraf motor sebagai perintah yang harus dilaksanakan oleh efektor

# GERAK REFLEKS

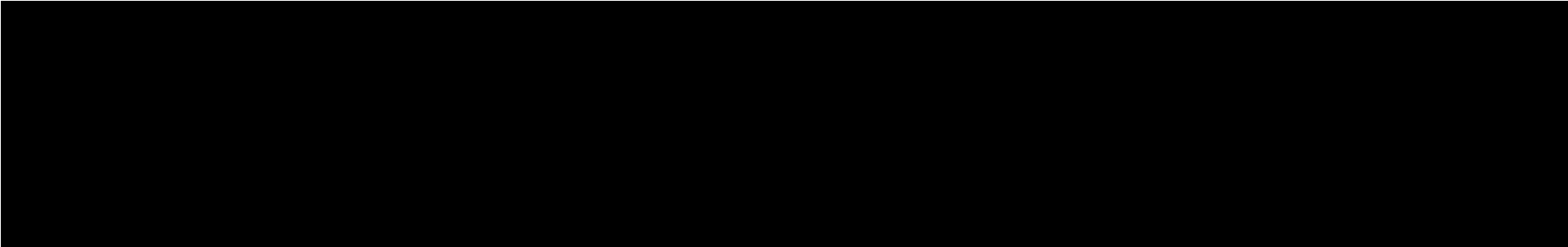
- Berjalan sangat cepat dan tanggapan terjadi secara otomatis terhadap rangsangan
- Dimulai dari reseptor penerima rangsang → diteruskan oleh saraf sensori ke pusat saraf → diterima oleh sel saraf penghubung (asosiasi) tanpa diolah di dalam otak langsung dikirim tanggapan ke saraf motor untuk disampaikan ke efektor, yaitu otot atau kelenjar

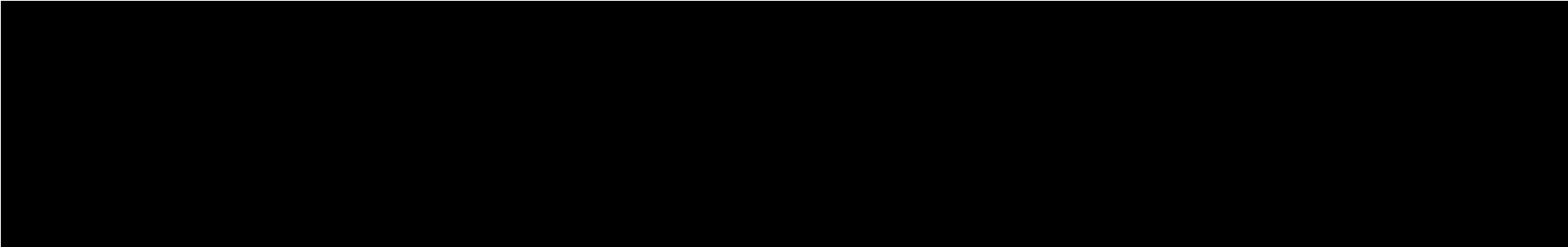
# Tractus Pyramidalis



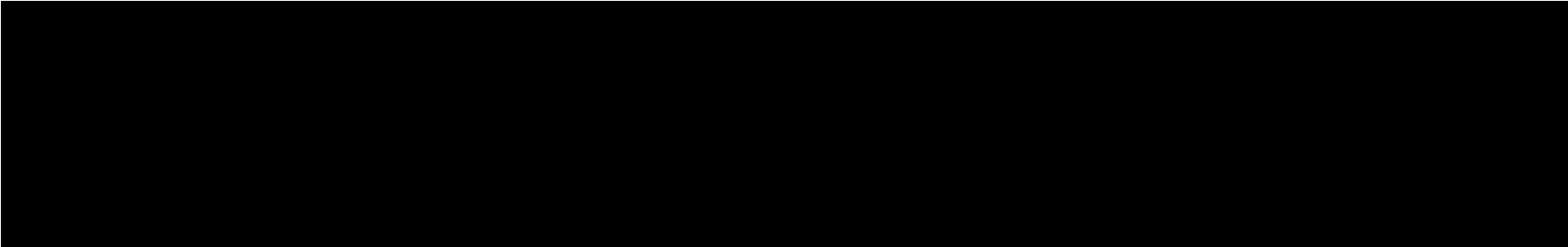
# Pyramidal

- The pyramidal system is a two neuron system consisting of upper motor neurons in the Primary Motor Cortex and lower motor neurons in the anterior horn of the spinal cord.
- Each of these neurons have extremely long axons.

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- The upper motor neuron axon extends all the way from the brain down to the spinal cord, a distance 1-3 feet or more, and
  - The lower motor neuron axon extends from the spinal cord to the skeletal muscles of the arms or legs, a distance 4-5 feet in very tall people.

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- The upper motor neurons reside in the precentral gyrus of the frontal lobe also called the "motor strip". These upper motor neurons are arranged in a stereotypical fashion. The upper motor neurons reside in the precentral gyrus of the frontal lobe also called the "motor strip". These upper motor neurons are arranged in a stereotypical fashion.



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- Neurons which control movements of the face and mouth are located near the Sylvian or lateral fissure and neurons which control the muscles of the thighs and legs are located near the medial longitudinal fissure and within the central sulcus

# Pyramidal Motor System

## Corticobulbar tract

- Upper motor neurons which innervate the muscles of the face and head are located near the lateral fissure of the brain. Their axons coalesce to form the corticobulbar tract. These axons then descend within the Genu of the internal capsule to the medial part of the cerebral peduncle. The upper motor neuron axons then synapse on Lower motor neurons of the cranial nerve nuclei which are located in midbrain, pons and medulla

# Extrapyramidal Motor System

- The extrapyramidal system dampens erratic motions, maintains muscle tone and truncal stability. It is phylogenetically older than the pyramidal system and thus plays a relatively more important role in lower animals. Many of its synaptic connections are extremely complex and even today, poorly understood. Neurodegenerative disorders which affect the extrapyramidal system have yielded much of our knowledge about its normal function.

- The major parts of the extrapyramidal system are the "subcortical nuclei". This includes the **caudate, putamen, and globus pallidus** which are also known as the Basal ganglia. The caudate nucleus is especially affected in Huntington's chorea.

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- The **Substantia nigra**, is located in the midbrain. It is particularly affected in idiopathic Parkinson's disease.

The **thalamus** is a very complex structure with many functions including cognition and pain perception, but parts of the thalamus are also components of the extrapyramidal system.

Other nuclei include the **Subthalamic nucleus**. Unilateral damage to the subthalamic nucleus results in hemiballism.

The final major nucleus is the **Red Nucleus** which is immediately adjacent to the substantia nigra in the midbrain.

