

SİNİR SİSTEMİ

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Anatomi Anabilim Dalı

Basal Nuclei

- ▶ Act by modifying ongoing activity in motor pathways
- ▶ Primary functions
 - ▶ Regulates muscle tone throughout the body
 - ▶ Selecting and maintaining purposeful motor activity while suppressing useless or unwanted patterns of movement
 - ▶ Helping monitor and coordinate slow, sustained contractions, especially those related to posture and support
 - ▶ Controls large automatic movement

CEREBRUM

▶ Diencephalon:

- ▶ Epithalamus
- ▶ Metathalamus
- ▶ Dorsal thalamus
- ▶ Ventral thalamus (subthalamus)
- ▶ Hypothalamus
- ▶ Hypophysis

Thalamus

- ▶ Final relay point for ascending sensory information
- ▶ Coordinates the activities of the cerebral cortex and basal nuclei
- ▶ **Domain-specific information processing**

Hypothalamus

- ▶ Receives indirect sensory inputs from all sensory systems
- ▶ Sends neural outputs to various motor control nuclei
- ▶ Sends neural outputs to sympathetic and parasympathetic nervous systems
- ▶ Sends both neural and hormonal outputs to pituitary

Hypothalamus

- ▶ Controls somatic motor activities at the subconscious level
- ▶ Controls autonomic function
- ▶ Coordinates activities of the endocrine and nervous systems
- ▶ Secretes hormones
- ▶ Produces emotions and behavioral drives
- ▶ Coordinates voluntary and autonomic functions
- ▶ Regulates body temperature
- ▶ Coordinates circadian cycles of activity
- ▶ 4Fs: feeding, fighting, fleeing, and reproductive behavior

CEREBELLUM

- ▶ Posterior cranial fossa
- ▶ Two hemispheres+vermis
- ▶ Function: Coordinates actions of postural muscles and programs somatic motor movements

Layers of the Brain (Meninges)

- Dura mater
- Arachnoid mater
- Pia mater

Ventricular System

- ▶ Lateral ventricles: largest, separated by septum pellucidum.
- ▶ Interventricular foramen (of Monro): lateral ventricles to 3rd ventricle
- ▶ 3rd ventricle: lies between thalamic masses
- ▶ Cerebral Aqueduct (of Sylvius): 3rd to 4th ventricle

Secretion and circulation of CSF

- ▶ Choroid plexuses
 - ▶ 400-500 ml/day
 - ▶ Subarachnoid cisterns
 - ▶ Arachnoid granulations
 - ▶ Superior sagittal sinus
 - ▶ Venous system
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graph TD; A[Choroid plexuses] --> B[Arachnoid granulations]; B --> C[Superior sagittal sinus]; C --> D[Venous system];
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- The diagram illustrates the flow of cerebrospinal fluid (CSF) from its site of production to its exit from the subarachnoid space. It starts with the choroid plexuses, which produce CSF at a rate of 400-500 ml per day. The CSF then moves into the subarachnoid cisterns, where it is absorbed by arachnoid granulations. These granulations are located near the superior sagittal sinus, and the CSF is eventually drained into the venous system.

# Arteries of the Brain

- ▶ Internal carotid artery
- ▶ Vertebral artery

# Circle of Willis (Cerebral Arterial Circle)

- ▶ Anterior cerebral arteries
- ▶ Anterior communicating artery
- ▶ Internal carotid artery
- ▶ Posterior communicating artery
- ▶ Posterior cerebral arteries

# Venous drainage of the brain

- ▶ Superior cerebral veins
  - ▶ Deep cerebral veins

- ▶ Elhan, A. (2003). Anatomi terimleri sözlüğü. 1. Baskı. Güneş Kitabevi. Ankara.
- ▶ Demirel A., Koşar N.Ş. (2006). İnsan Anatomisi ve Kinesiyolojisi. 2. Baskı. Nobel Yayın Dağıtım. Ankara.
- ▶ Dere, F. (1999). Anatomi Atlası ve Ders Kitabı. 5. Baskı. Adana Nobel Tıp Kitabevi. Adana.
- ▶ Guyton, A.C. (1989). Tıbbi Fizyoloji. Türkçe Üçüncü Baskı. nobel Tıp Kitabevi. İstanbul.
- ▶ Standring, S. (2008). Gray's Anatomy. Fortieth Edition. Churchill Livingstone Elsevier. Spain.
- ▶ Elhan, A.: İnsan Anatomisi Atlası (çeviri: Köpf-Maier, P: WolfHeidegger's Atlas of HumanAnatomy. 5.ed.) Güneş Kitabevi, Ankara, 2001.
- ▶ Elhan, A.: Temel Klinik Anatomi (çeviri: Moore, K.L.), İkinci baskı, Güneş Kitabevi, 2006.
- ▶ Standring, S.: Gray's Anatomy. The Anatomical Basis of Clinical Practice. 38.ed., Churchill Livingstone, New York, 2003.