

THE UNIVERSITY OF CONNECTICUT
Schools of Medicine and Dental Medicine
Introduction to Neuroscience – Meds 370
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BASIC CNS ORGANIZATION

Suggested Reading: Kandel, 2000, Chapter 17.

1. MAJOR DIVISIONS OF THE NERVOUS SYSTEM

- a. Peripheral Nervous System (PNS)
 - i. Somatic
 - ii. Autonomic
 - (1) Sympathetic
 - (2) Parasympathetic
 - (3) Enteric
- b. Central Nervous System (CNS)
 - i. Spinal cord
 - ii. Brain

2. MEMBRANOUS COVERING OF THE BRAIN

- a. Dura mater
 - i. Falx cerebri
 - ii. Tentorium cerebelli
- b. Arachnoid
- c. Pia mater

3. REGIONAL ORGANIZATION OF THE CNS

Larger regions define the parts of brain and spinal cord. These are the basic building blocks organized during development of the CNS.

REGION	IDENTIFYING STRUCTURES	CRANIAL NERVE
a.	Spinal cord -	
	Dorsal roots	XI. Spinal accessory cranial nerve, Motor
	Ventral roots	
b.	Myelencephalon - medulla .	.
	Pyramids	XII. Hypoglossal , Motor
	Fourth Ventricle	X. Vagus , Motor, Parasympathetic, Visceral Sensory, General Sensory
	Inferior Olive	IX. Glossopharyngeal , Motor, Parasympathetic, Visceral Sensory, General Sensory
		VIII. Vestibulocochlear , Special Sensory
		VII. Facial , Motor, Parasympathetic, Visceral Sensory, General Sensory
		VI. Abducens , Motor
c.	Metencephalon - pons .	
	Cerebellum	V. Trigeminal , Motor, General Sensory
	Pontine protuberance	
	Fourth ventricle	

- d. Mesencephalon - **midbrain.**
 - Tectum III. **Oculomotor**, Motor, Parasympathetic
 - Cerebral peduncles IV. **Trochlear**, Motor
 - e. Diencephalon- **thalamus.**
 - Optic chiasm II. **Optic** cranial nerve, Special Sensory
 - Hypothalamus
 - f. Telencephalon - basal ganglia & **cortex.**
 - I. **Olfactory** cranial nerve, Special Sensory
- Major Lobes of cerebral cortex
- i. Frontal lobe
 - ii. Parietal lobe
 - iii. Occipital lobe
 - iv. Temporal lobe

CNS GLOSSARY

- area -- regions of cerebral cortex or hypothalamus
- body -- name for certain nuclei
- column (gray matter) -- name for certain nuclei arranged in longitudinal array
- column (white matter) -- an expanse of long axons that make connections between nuclei
- convolution -- gyrus in the cortex
- fillet -- (british) -- an expanse of long axons that make connections between nuclei
- fasiculus -- another expanse of long axons that make connections between nuclei
- funiculus -- particularly in the spinal cord, long axons that make connections between nuclei
- gray matter -- areas that contain cell bodies, dendrites, and synapses
- gyrus -- an elevation or crest of a cortical fold
- lemniscus -- still another expanse of long axons that make connections between nuclei
- nucleus -- aggregates of neuronal cell bodies, dendrites, and synapses in the non-cortical CNS
- sulcus -- a depression or trough of a cortical fold
- tract -- axons that make connections between nuclei, not necessarily visible at a fasiculus, lemniscus, or funiculus
- white matter -- areas that contain only axons