

CNS-1 Introduction to the CNS. General organization. Spinal cord, spinal nerve.

OBJECTIVES OF THE CLASS:
THEORETICAL
1. to know basic terms and expressions used in neuroanatomy (i.ex. neuron, axon, dendrites, fibers, cortex, ganglia, nuclei, pathways, ...); 2. to have basic information on the CNS development; 3. to know the meninges of the CNS and their extensions; 4. to know the vasculature of the spinal cord;
THEORETICAL and PRACTICAL
5. to know the general orientation of the encephalon and to recognize its main elements; 6. to know external and internal structure of the spinal cord; 7. to know a scheme of the spinal nerve (practical recognition of all elements in the model).

A student should be prepared theoretically for the lab class.

The information may be found in the chapter 1, 4 and 15 (*Clinical neuroanatomy* by Snell) and in the lecture 1.

DURING THE SEMINAR:
<ul style="list-style-type: none">- a general orientation of the specimen of encephalon is presented;- main elements of the encephalon are identified and named;- the external structure of the spinal cord is explained;- a scheme of the spinal nerve (model) is presented and all its elements are named.

DURING THE PRACTICAL CLASS A STUDENT SHOULD RECOGNIZE AND IDENTIFY:
<ul style="list-style-type: none">- main elements of the specimen of encephalon;- elements of external and internal structure of the spinal cord (in the model);- the elements of the spinal nerve (in the model). <p>The student may use the list attached below as a reference of demanded structures.</p>

AFTER THE CLASS A STUDENT:
<ul style="list-style-type: none">- should understand the meaning of basic terms used in neuroanatomy;- should know the meninges of the CNS and be able to list their extensions;- should be able to give a general description of the specimen of encephalon;- should be able to recognize and identify main elements of the encephalon;- should know basic relations between morphology and CNS development;- should be able to present morphological features of the spinal cord (external and internal structure) and differentiate its appearance at different levels;- should be able to give a theoretical description of the blood supply to the spinal cord;- should be able to identify and name the elements of the spinal nerve.

At the end of the class a student should participate in the credit consisting of 6 MCQ and 4 pins in order to confirm the presence at the class and collect the points if successful.

EXAMPLE QUESTIONS (choose <u>one</u> correct answer):	
Pons develops from: A. prosencephalon B. telencephalon C. diencephalon D. mesencephalon E. rhombencephalon	Which of the following structures can be found in posterior cranial fossa: A. medulla oblongata B. lateral ventricle C. third ventricle D. superior sagittal sinus E. posterior root ganglion

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List of the structures to be practically identified and recognized by the student:

NERVOUS SYSTEM

Grey matter
White matter
Ependyma

MENINGES

Dura mater
 Falx cerebri
 Falx cerebelli
 Tentorium cerebelli
 Diaphragma sellae
Arachnoid mater
 Arachnoid granulations
Pia mater

CENTRAL NERVOUS SYSTEM

Encephalon
 Brain (Cerebrum)
 Cerebral hemisphere
 Cerebral cortex
 Cerebral gyri
 Cerebral sulci
 Cerebral lobes
 Longitudinal cerebral fissure
 Lateral sulcus
 Cerebellum
 Cerebellar hemisphere
 Vermis cerebelli
 Brainstem
 Midbrain (mesencephalon)
 Pons
 Medulla oblongata
Spinal cord

CNS DEVELOPMENT

Prosencephalon (Forebrain)
 Telencephalon
 Diencephalon
Mesencephalon (Midbrain)
Rhombencephalon (Hindbrain)
 Metencephalon
 Pons
 Cerebellum
 Myelencephalon
 Medulla oblongata

PERIPHERAL NERVOUS SYSTEM

Cranial nerves
Spinal nerves

VENTRICULAR SYSTEM OF THE BRAIN

Lateral ventricle
Third ventricle
Fourth ventricle
Cerebral (mesencephalic) aqueduct
Subarachnoid space
Subarachnoid cisterns

SPINAL CORD

External features:

Cervical enlargement
Lumbar enlargement
Conus medullaris
Cauda equina
Filum terminale

Cross-sections:

Central canal
Anterior median fissure
Posterior median groove
Posterior median septum
Anterolateral groove
Posterolateral groove
Posterior intermediate groove
White columns
 Anterior white column
 Lateral white column
 Posterior white column
 Fasciculus gracilis
 Fasciculus cuneatus
Grey columns
 Anterior column
 Anterior horn = Ventral horn
 Posterior column
 Posterior horn = Dorsal horn
 Lateral column
 Lateral horn
Grey commissure
Anterior white commissure
Posterior white commissure
Substantia gelatinosa

SPINAL NERVE

Anterior root = Ventral root
Posterior root = Dorsal root
Spinal ganglion = Posterior root ganglion
Trunk of the spinal nerve
Anterior ramus = Anterior branch
Posterior ramus = Posterior branch
Meningeal ramus = Meningeal branch
White communicating ramus (branch)
Grey communicating ramus (branch)