

SYLLABUS

SPRING 2011

COURSE:

HCS-AND ACN-7344 FUNCTIONAL HUMAN NEUROANATOMY

Instructor: Aage R. Møller Ph.D.

E-mail: AMOLLER@UTDALLAS.EDU

Class schedule: Main Campus:

MW 04:00 PM - 05:15 PM GR 4.301

January 10, 2011

Class text: Brodal, P. The Central Nervous System, 4rd Edition, 2010,

ISBN13: 9780195381153

ISBN10: 0195381157

Supplementary readings:

Shepherd G. Neurobiology 3rd ed.

Oxford Press, New York 1994 ISBN 0-19-508843-3

Atlas of Neuroanatomy, Thieme, 2007

ISBN:1-58890-441-5, 9-781588-904416

Grading:

1. Midterm Exam February 26: Covers the first section to February 17

2. Final Exam April 30th.

Course purpose: The purpose of this class is to develop an understanding of the anatomy and function of the human nervous system, and some disorders of the central nervous system.

General objectives:

Students will:

1. Understand the basic anatomy and function main structures of the human central nervous system
2. Understand the general function of the lateral tracts of the motor system
3. Understand the general function of the medial tracts of the motor system
4. Understand the anatomy and the function of the basal ganglia
5. Know anatomy and function of spinal reflexes
6. Understand the role of proprioception in motor control
7. Understand the general anatomy and function of cranial nerves
8. Anatomy and function of cranial nerve reflexes including the vestibular ocular reflex
9. Know the anatomy of sensory organs and the differences between different senses.
10. Know the anatomy of ascending sensory pathways
11. Understand the difference between classical and non-classical (lemniscal and extralemniscal) ascending sensory pathways.
12. Know the anatomy of efferent sensory systems and some of their functions
13. Understand how sensory information can reach structures of the limbic system
14. Understand the role of neural plasticity in motor function
15. Understand the role of neural plasticity in sensory function
16. Understand the pathophysiology of some common disorders that affect the function of motor systems

17. Understand the pathophysiology of some common disorders that affect the function of sensory systems with specific reference to pain
18. Know the anatomy and the basic functions of the different structures of the limbic system
19. Understand the anatomical and functional basis for cognitive functions

Course layout

This is a systems oriented course that covers the anatomical organization and the physiology of the central nervous system including the sensory motor pathways. The course describes the anatomy and basic features of sensory and motor systems, limbic systems and the anatomical and functional basis for cognitive functions. The generation and processing of motor commands, and processing of sensory signals are covered in detail. The anatomy of the two main motor systems and the two main sensory systems is described and their similarities are emphasized. The role of the basal ganglia and the cerebellum in motor control, and spinal and reflexes in motor control is discussed. The transformation of sensory signals that occurs in the nuclei of the classical ascending neural pathways and the processing that occurs at different levels of the central nervous system is discussed. The pathophysiology of some common disorders of motor and sensory systems and the role of neural plasticity in creating symptoms and signs of disease are discussed.

OUTLINE

1. Basic building blocks of the central nervous system
2. Cerebral cortex
3. Brainstem
4. Spinal cord
5. Autonomic nervous system
6. Cranial nerves
7. Spinal nerves
8. Spinal reflexes
9. Central motor pathways
10. Basal ganglia
11. Cerebellum
12. Proprioception
13. Subcortical coordination of motor and sensory functions
14. Somatosensory systems
15. Balance system
16. Limbic system
17. Pain pathways
18. Central pain
19. Neural plasticity
20. Development of the nervous system
21. Aging

11/28/10