

Brain & Cranial Nerves Study Guide  
C14 // Toratora and Derrickson (S2017)

Note: you will be tested on the anatomy of the brain in the lab exam, however. In order to discuss the function of the brain, it is a prerequisite that you understand the brain's structure.

1. How is the brain structurally divided (hint: three divisions)?
2. What is the definition of rostral and caudal?
3. What four structures make up the brain stem?
4. Define the following terms: sulcus, gyrus, fissure (add these to your vocabulary list):
5. What is the structure of the brain stem? (four parts)
6. Where is white matter and grey matter found in the brain? How is this tissue arranged differently in brain and spinal cord?
7. How is the connective tissue surrounding the brain organized?
8. What is the relationship between the dura mater and the brain's cranial sinuses? What role do the arachnoid villus play in this relationship?
9. What are the functions of cerebrospinal fluid?
10. What produces the CSF?
11. How does CSF "flow" through the brain and spinal cord?
12. How do "special ependymal cells" produce CSF?
13. How many ventricles are in the brain?
14. What structure is located in the roof of the brain barriers?
15. What is the blood brain barrier? Significance? What glial cell creates the the BBB?
16. What is the fuction of the arachnoid villi?
17. Why do we need a BBS?
18. How many types of "brain barriers" do we have in the brain?
19. Is there a brain-cerebral spinal fluid barrier?

20. What type of substance passes through the brain barrier system?
21. Where are circumventricular organs found? What is the importance of the circumventricular organs? Think about viruses?
22. What functions are associated with the medulla oblongata?
23. What structure is located between the pons and the cerebellum?
24. The pons is a relay station for nerve tracts in the CNS. Three different nerve tracks connect the pons with the cerebellum. What is the role of these nerve tracks (also called peduncles)?
25. What is the main function of the cerebellum? Examples
26. How are cerebellum signals processed by the three cerebellar peduncles?
27. There are many important nuclei in the midbrain. One such nucleus is the substantia nigra. What is the function of this nucleus and what disease is associated with the degeneration of the neurons in the substantia nigra?
28. Where is the reticular formation located? What types of functions are associated with the reticular formation?
29. Where is the midbrain located?
30. What is the structure which runs through the length of the midbrain and carries CSF?
31. What three structures form the diencephalon? Functions?
32. What type of action potentials pass through the thalamus? What is the one exception?
33. What is the control center (i.e. the boss) of the autonomic nervous system and endocrine system?
34. Where are the basal nuclei located (relative to the thalamus)? What is the general function of the basal nuclei?
35. Where is the limbic system located?
36. What is the limbic system's "nick name"?
37. What functions are associated with the limbic system structure?
38. What are names and locations of the cerebrum's lobes? Related functions?

39. The white matter of the cerebrum form tracts. What are the three types of tracts in the cerebrum? Functions?
40. Where is the hippocampus located? What is the function of the hippocampus?
41. What type of functions do we associate with the prefrontal cortex?
42. What type of functions do we associate with the hypothalamus? Regulates what type of functions?
43. Where do we form and store our feelings and emotional memories?
44. What are somesthetic sensations? How are somesthetic sensations routed to the primary somesthetic cortex? Where is the primary somesthetic cortex located?
45. What is the location and function of the sensory association area?
46. Where do we store “skeletal muscle’s motor programs” (e.g. how to tie your shoes)?
47. How many neurons form the path between the primary motor cortex and a skeletal muscle? What are these neurons called?
48. What is cognition?
49. Where is short term memory formed stored within the brain? What is the difference between sensory memory, short term memory and long term memory?
50. What is the function of the prefrontal cortex? What areas of the brain communicate with the prefrontal cortex?
51. What structure plays a role of comparing the intent and performance in motor control?
52. Where is the primary motor cortex located? What is the function of the primary motor cortex?
53. Where is the primary somatosensory cortex located? What is the relationship between the thalamus and the somatosensory cortex?
54. What is the relationship between upper and lower motor neurons?
55. Where is the Broca and Wernicke areas located? What language functions are associated with Wernicke and Broca areas?

56. Which cerebral hemisphere dominate in the Wernicke and Broca functions? What does the other hemisphere contribute to language?
57. What do we mean by Cerebral Lateralization? Language or answering this questions VS painting or playing music
58. What are cranial nerves? Where do they originate? How do they reach their target tissue?
59. Are cranial nerves sensory or motor? Explain
60. What is the function of these cranial nerves: I, II, VIII, X.
61. What is the difference between the precentral gyrus and postcentral gyrus?
62. Where are the control centers for heart and respiratory regulation located?
63. What is the startle reflex? What brain structures are associated with the sound and sight startle reflex?
64. Where is the reticular formation located? Functions
65. What happens if the tract between the reticular formation and the cerebrum is broken?