**Intro to Neuroscience**

1. What are the two basic categories of cells that make up the nervous system?
2. What can these two categories be further subdivided into, based on characteristics of the CNS and the PNS?
3. What makes up the CNS and what type of cells would you find here?
4. What makes up the PNS and what type of cells would you find here?
5. What are the two ways of classifying neurons?
6. Give three examples of neurons that are classified by their shape and size. Which is the most common?
7. Give four examples of neurons that are classified by their function.
8. What are Schwann cells? Give three functions of them.
9. What are nodes of Ranvier? What do they do?
10. Name the four different types of glial cells.
11. What are their functions?
12. Draw and label a nerve cell with these parts: dendrite, axon, cell body, synaptic ending
13. What is the function of the dendrite?
14. What is the function of the axon?
15. What is the function of the cell body?
16. What is the function of the synaptic ending?
17. Are the cell bodies (soma) made of white matter or grey matter?
18. Are the axons made of white matter or grey matter?
19. What is the difference between white and grey matter?
20. Separate the following terms according to their location (white or grey matter): peduncle, soma, axon, tract, funiculus, cortex, lemniscus, nuclei, fasciculus
21. What is the purpose of a neuron?
22. What is the resting surface membrane potential of a neuron?
23. What is this maintained by?
24. What is its purpose?
25. What is the path (from beginning to end) down which a chemical transmitter travels?
26. What is the purpose of chemical transmitters (two specific purposes)?
27. What is the relative Na+ and K+ concentration outside of the cell?
28. Explain the sodium pump and how the neuronal membrane reaches resting potential.
29. What is resting potential (the definition, not the number)?
30. How do axons conduct signals away from the cell body?
31. What is the “fastest signal?”
32. Where are impulses carried?
33. For an action potential to occur, what must happen?
34. T or F: When an action potential occurs, it can send all of the signal or part of the signal depending its strength.
35. What follows the occurrence of an action potential? What happens during this time?
36. Which axon would have faster conduction velocity: myelinated or non-myelinated? Why?
37. T or F: The axon has a uniform diameter throughout its length.
38. T or F: The diameter of an axon is proportionate to its length.
39. T or F: The larger the diameter, the slower the conduction velocity.
40. T or F: The smaller the diameter, the faster the conduction velocity.
41. Put the peripheral nerves in order from largest to smallest, while labeling whether they are myelinated or unmyelinated: III fibers (A delta), A alpha fibers, Type IA fibers, A gamma fibers, Type IV or C fibers, Type IB fibers, B fibers, Type II fibers,
42. Electrical signaling can be disturbed by damage to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ \_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_.
43. Two disorders affecting electrical signaling of which causes are unknown are:
44. A disorder affecting electrical signaling of which the cause is genetic is:
45. Three disorders affecting electrical signaling of which the cause is inflammatory are:
46. The three parts of the synapse include the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where a chemical is released, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where the chemical diffuses, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where the chemical binds.
47. Which neurotransmitter results in rapid, point to point transmission in the PNS?
48. Which neurotransmitter results in rapid, point to point transmission in the CNS?
49. Which neurotransmitters result in slow, diffuse transmission?
50. Draw a spinal cord and label the following parts: dorsal sulcus, ventral sulcus, white matter, grey matter, central canal, dorsal root, ventral root, sensory cell bodies, motor cell bodies, motor fibers, sensory fibers, ganglion, interneuron, spinal nerve, receptor, effector
51. As far as connective tissue covering peripheral nerves, we have the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is wrapped in bundles by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is covered by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Then the three layers of tissue surrounding the brain are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ,which is covered by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is covered by the most “durable” layer, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
52. What is an involuntary and stereotypical response to a stimulus?
53. Two examples of primitive reflexes that integrate as we grow are:
54. MSR stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is also known as a DTR or a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
55. The simplest type of reflex is : (common and scientific name)
56. For a reflex to occur, first the \_\_\_\_\_\_\_\_\_\_\_\_\_ information is sent to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or more specifically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This information then synapses with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which causes a motor response to sensory input.
57. What is a muscle spindle?
58. Where is a muscle spindle located?
59. How is a muscle spindle involved in a MSR?
60. Two intrafusal parts to a muscle spindle are:
61. T or F: A nuclear chain is sensitive to length changes.
62. T or F: A nuclear bag is sensitive to rate of changes.
63. Two sensory endings in a muscle spindle are:
64. T or F: A primary ending has flower-spray endings.
65. T or F: A secondary ending has annulospiral endings.
66. The lower motor neuron \_\_\_\_\_\_\_\_\_\_\_\_\_ motor information.
    1. Receives
    2. Sends
67. T or F: The alpha motor supply is intrafusal and is large.
68. T or F: The gamma motor supply is extrafusal and is small.
69. If we compare the surface of thebrain to mountains and valleys, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would be the mountains, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would be the valleys.
70. The two parts of the diencephalon are:
71. The lobe of the brain that controls our motor function is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
72. The part of the brain that controls our executive decisions is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lobe.
73. What lobe of the brain controls our sensory function?
74. What lobe of the brain controls our vision?
75. What lobe of the brain controls our hearing?
76. What lobe of the brain controls our emotions, memory, and drives?
77. Be able to label lobes on a brain…
78. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ganglia controls movement and has related structures in the brainstem.
79. Two major components of the Limbic system are:
80. Means “little brain.”
81. What coordinates trunk movements?
82. What coordinates limb movements?
83. Which cranial nerves does the brainstem house?
84. What are the three divisions of the brainstem?
85. Which is continuous with the diencephalon?
86. Which is connected to the cerebellum?
87. Which is continuous with the spinal cord?
88. Primary afferent (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) pathways lead into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This includes the second order neuron which projects to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , and the third order neuron which projects from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
89. Primary efferent (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) pathways come from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
90. The three destinations of afferent (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) inputs are:
91. Sensory inputs sent to illicit conscious awareness or appropriate behavioral responses are directed to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
92. Sensory inputs sent to illicit coordination are directed to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
93. An upper motor neuron is a neuron whose axon starts at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and goes to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to affect the activity of lower motor neurons.
94. Six tracts in which UMN involved:
95. Is a lower motor neuron small or large?
96. Where are LMN’s found?
97. What do the axons of LMN’s innervate?
98. What are two other names for LMN’s?
99. From what do LMN’s receive direct information? (three things)
100. From what do LMN’s receive indirect information? (two things)
101. So, we have UMN’s which are located in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with descending axons that terminate on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, as opposed to the LMN’s which are located in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and terminate on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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| --- | --- | --- |
|  | 1. UMN | 1. LMN |
| 1. Strength |  |  |
| 1. Muscle Tone | 1. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) | 1. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |
| 1. MSR | 1. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) | 1. (\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |
| 1. Atrophy |  |  |
| 1. Other signs | 1. (+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |  |

1. A somatotopic representation of which areas of our brain control certain areas of our body is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. What is a syndrome characterized initially by ipsilateral spinal shock below the level of the lesion?
3. T or F: Later in Brown Sequard syndrome, MSR is increased below the level of the lesion.
4. T or F: Later in Brown Sequard syndrome, there is contralateral loss of all motor, proprioception, and discriminative touch.
5. T or F: Later in Brown Sequard syndrome, there is ipsilateral loss of pain and temperature below the level of the lesion.