

NAME _____ LAB TIME/DATE _____

REVIEW SHEET
exercise

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Spinal Cord, Spinal Nerves, and the Autonomic Nervous System

Anatomy of the Spinal Cord

1. Match the descriptions given below to the proper anatomical term:

Key: a. cauda equina b. conus medullaris c. filum terminale d. foramen magnum

d 1. most superior boundary of the spinal cord

c 2. meningeal extension beyond the spinal cord terminus

b 3. spinal cord terminus

a 4. collection of spinal nerves traveling in the vertebral canal below the terminus of the spinal cord

2. Match the key letters on the diagram with the following terms.

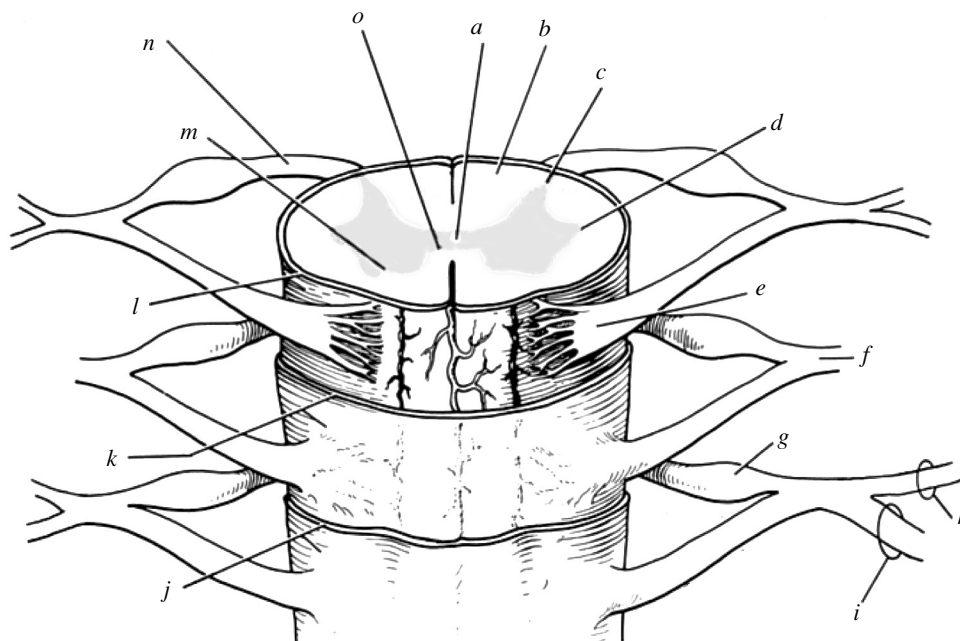
m 1. anterior (ventral) horn n 6. dorsal root of spinal nerve c 11. posterior (dorsal) horn

k 2. arachnoid mater j 7. dura mater f 12. spinal nerve

a 3. central canal o 8. gray commissure i 13. ventral ramus of spinal nerve

h 4. dorsal ramus of spinal nerve d 9. lateral horn e 14. ventral root of spinal nerve

g 5. dorsal root ganglion l 10. pia mater b 15. white matter



cord transection in an auto accident). The muscle receives no stimulation; thus, it becomes flaccid and atrophies. Spastic paralysis
occurs as a result of upper motor neuron damage (e.g. from brain hemorrhage). Voluntary motor activity is lost, but reflex movements
initiated by spinal cord neurons still occur. The muscle does not become limp (flaccid), but instead becomes more tense and shows
hyperactive and uncontrolled movement.

Spinal Nerves and Nerve Plexuses

9. In the human, there are 31 pairs of spinal nerves, named according to the region of the vertebral column from which they issue. The spinal nerves are named below. Indicate how they are numbered.

cervical nerves C₁ - C₈ sacral nerves S₁ - S₅
 lumbar nerves L₁ - L₅ thoracic nerves T₁ - T₁₂

10. The ventral rami of spinal nerves C₁ through T₁ and T₁₂ through S₄ take part in forming plexuses, which serve the limbs and anterior trunk of the body. The ventral rami of T₂ through T₁₂ run between the ribs to serve the intercostal muscles. The dorsal rami of the spinal nerves serve the posterior body trunk.

11. What would happen if the following structures were damaged or transected? (Use key choices for responses.)

Key: a. loss of motor function b. loss of sensory function c. loss of both motor and sensory function

b 1. dorsal root of a spinal nerve c 3. anterior ramus of a spinal nerve

a 2. ventral root of a spinal nerve

12. Define *plexus*: A complex network of joining and diverging nerves.

13. Name the major nerves that serve the following body areas:

cervical 1. head, neck, shoulders (name plexus only)

phrenic 2. diaphragm

sciatic 3. posterior thigh

common fibular, tibial, sural, medial and lateral plantar 4. leg and foot (name two)

median ulnar 5. anterior forearm muscles (name two)

radial, musculocutaneous 6. arm muscles (name two)

lumbar 7. abdominal wall (name plexus only)

femoral 8. anterior thigh

ulnar 9. medial side of the hand

Dissection of the Spinal Cord

14. Compare and contrast the meninges of the spinal cord and the brain. Both the spinal cord and the brain have three meninges: pia mater, arachnoid mater, and dura mater. In the brain the dura mater has two layers—periosteal and meningeal. The spinal cord has only the meningeal layer.
15. How can you distinguish between the anterior and posterior horns? The anterior horns are wider than the posterior horns. The posterior horns extend closer to the edge of the spinal cord.
16. How does the position of gray and white matter differ from that in the cerebral hemispheres of the sheep brain? White matter is deep to the gray matter of the cerebral cortex, and superficial to the gray matter of the spinal cord.

The Autonomic Nervous System

17. For the most part, sympathetic and parasympathetic fibers serve the same organs and structures. How can they exert antagonistic effects? (After all, nerve impulses are nerve impulses—aren't they?)
They release different neurotransmitters, which bind to different receptors.
18. Name three structures that receive sympathetic but not parasympathetic innervation.
Adrenal glands, arrector pili muscles, and sweat glands.
19. A pelvic splanchnic nerve contains (circle one):
 a. preganglionic sympathetic fibers. **c. preganglionic parasympathetic fibers.**
 b. postganglionic sympathetic fibers. d. postganglionic parasympathetic fibers.
20. The following chart states a number of conditions. Use a check mark to show which division of the autonomic nervous system is involved in each.

Sympathetic division	Condition	Parasympathetic division
✓	Secretes norepinephrine; adrenergic fibers	
	Secretes acetylcholine; cholinergic fibers	✓
	Long preganglionic axon; short postganglionic axon	✓
✓	Short preganglionic axon; long postganglionic axon	
	Arises from cranial and sacral nerves	✓
✓	Arises from spinal nerves T ₁ through L ₃	
	Normally in control	✓
✓	"Fight or flight" system	
	Has more specific control (Look it up!)	✓