

STUDY GUIDE: Nervous system, Nerve Impulse Transmission and Reflex Arc

Chapter 48

KEY TERMS

neuron	ganglia	synaptic terminal
cell body	nerve	synaptic cleft
dendrite	nerve impulse	neurotransmitter
axon	resting potential	postsynaptic membrane
glial cells	membrane potential	acetylcholine
myelin sheath	equilibrium potential	endorphins
nodes of Ranvier	threshold	dopamine
Schwann cell	all-or-none response	serotonin
synapse	action potential	receptor
sensory neuron	voltage-gated(sensitive)	effector
motor neuron	channel	reflex arc
interneuron	sodium-potassium pump	dorsal-root ganglion
astrocytes	refractory period	
blood-brain barrier	synapse	

QUESTIONS

1. Describe the structure of a typical neuron and, using a diagram point out the axon, dendrite, cell body, and myelin sheath. Indicate the path of information flow and point out a synapse and neuromuscular joint.
2. Explain how a nerve impulse is conducted along the neuron, using the terms stimulus, threshold, membrane potential, action potential, voltage-sensitive channel, all-or-none response and refractory period.
3. Discuss the basis for the polarization of the nerve cell membrane, considering the relative amounts of sodium, potassium, and negatively charged ions inside and outside the neuron, and state whether the outside of the resting neuron is charged positively or negatively with respect to the inside.
4. Explain in some detail how an impulse is transmitted(propagated) along a neuron fiber; specify which ions move and in what order when the fiber is stimulated, and explain what is meant by voltage-sensitive channels. Using a diagram, Explain how the nerve impulse is propagated along the neuron.
5. Explain how diffusion, electrostatic attraction, and the sodium-potassium pump act to reestablish the original ionic balance and keep the neuron functioning.
6. Using a diagram, identify the synaptic terminal, the presynaptic membrane, postsynaptic membrane, and synaptic cleft. Describe the events occurring at a synapse when an action potential arrives, and explain how the impulse is transmitted across the synapse and what must happen for an action potential to be induced in the postsynaptic neuron.
7. Name three transmitter substances(neurotransmitters).
8. Using a diagram, Trace the flow of information through a reflex arc.