

Part 4 Nervous System
Bio 250

Essentials of Human Anatomy & Physiology
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Seventh Edition

Chapter 7
The Nervous System

Slides 7.63 – 7.75

Lecture Slides in PowerPoint by Jerry L. Cook
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Spinal Nerves

- There is a pair of spinal nerves at the level of each vertebrae for a total of 31 pairs
- Spinal nerves are formed by the combination of the ventral and dorsal roots of the spinal cord
- Spinal nerves are named for the region from which they arise

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Autonomic Nervous System

- The involuntary branch of the nervous system
- Consists of only motor nerves
- Divided into two divisions
 - Sympathetic division
 - Parasympathetic division

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Differences Between Somatic and Autonomic Nervous Systems

- Nerves
 - Somatic – one motor neuron
 - Autonomic – preganglionic and postganglionic nerves
- Effector organs
 - Somatic – skeletal muscle
 - Autonomic – smooth muscle, cardiac muscle, and glands

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Differences Between Somatic and Autonomic Nervous Systems

- Neurotransmitters
 - Somatic – always use acetylcholine
 - Autonomic – use acetylcholine, epinephrine, or norepinephrine

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Anatomy of the Parasympathetic Division

- Originates from the brain stem and S₁ through S₄
- Terminal ganglia are at the effector organs
- Always uses acetylcholine as a neurotransmitter

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Anatomy of the Autonomic Nervous System

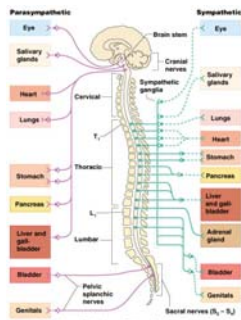


Figure 7.25

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Autonomic Functioning

- Sympathetic – “fight-or-flight”
 - Response to unusual stimulus
 - Takes over to increase activities
 - Remember as the “E” division = exercise, excitement, emergency, and embarrassment

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Autonomic Functioning

- Parasympathetic – housekeeping activities
 - Conserves energy
 - Maintains daily necessary body functions
 - Remember as the “D” division - digestion, defecation, and diuresis

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Development Aspects of the Nervous System

- The nervous system is formed during the first month of embryonic development
- Any maternal infection can have extremely harmful effects
- The hypothalamus is one of the last areas of the brain to develop

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Development Aspects of the Nervous System

- No more neurons are formed after birth, but growth and maturation continues for several years
- The brain reaches maximum weight as a young adult

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