

# Internal Affairs

## ■ How the *Nervous System* Works with Other Body Systems

## □ How Other Body Systems Work with the *Nervous System*

### *Integumentary System*

- Influences secretions from integumentary glands and contractions of arrector pili muscles
- Controls continuous blood flow to regulate heat loss
- Supports and protects peripheral receptors
- Provides sensations of heat, cold, pressure, pain, and vibration

### *Skeletal System*

- Innervates bones and monitors movements within joints
- Generates muscle tension needed for bone growth and maintenance
- Supports and protects the brain and spinal cord
- Stores calcium needed for neural function

### *Muscular System*

- Innervates muscles for autonomic and voluntary muscle contractions
- Generates body heat to maintain constant temperature for neural function
- Proprioceptors transmit impulses from muscles to the brain
- Facial muscles express emotional state

### *Endocrine System*

- Innervates endocrine glands causing rapid, autonomic secretion of hormones
- Hypothalamus controls the pituitary gland: sympathetic nervous system stimulates the adrenal medulla
- Hormones augment and sustain autonomic stimuli to body organs



### *Circulatory System*

- Innervates the heart and blood vessels to modify heart rate, blood vessel diameters, blood pressure, and routing of blood
- Transports O<sub>2</sub> and CO<sub>2</sub>, nutrients, and fluids to and from the brain and spinal cord
- Cerebrospinal fluid is produced from and returned to the blood

### *Lymphatic System*

- Innervates lymphoid organs
- Plays a role in regulating the immune response
- Protects against infections within the brain and spinal cord

### *Respiratory System*

- Respiratory centers within the brain stem control respiratory rates and depth of respiration
- Provides O<sub>2</sub> and eliminates CO<sub>2</sub>

### *Digestive System*

- Innervates digestive organs and autonomically regulates GI tract movements and secretions
- Regulates feeding behavior and defecation
- Provides nutrients for growth, maintenance, and repair of the nervous system

### *Urinary System*

- Innervates organs of urinary system to control urination
- Modifies renal blood pressure
- Eliminates metabolic wastes
- Regulates pH, body fluids, and electrolyte concentrations

### *Reproductive System*

- Innervates reproductive organs to control sexual function
- Gonads produce sex hormones that influence brain development and sexual behavior