

Internal Affairs

■ How the *Circulatory System* Works with Other Body Systems

□ How Other Systems Work with the *Circulatory System*

Integumentary System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Clotting mechanism heals breaks in the skin surface
- Provides site for thermoregulation
- Serves as a blood reservoir

Skeletal System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Delivers erythropoietin to bone marrow
- Protects the heart and thoracic vessels
- Provides a site (bone marrow) for hemopoiesis
- Serves as a reservoir of calcium needed for cardiac muscle contraction

Muscular System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes, including lactic acid
- Removes heat generated by exercise
- Muscle contraction assists blood movement

Nervous System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Certain capillaries help to form the blood-brain barrier
- Cerebrospinal fluid is produced from and returned to the blood
- Provides autonomic regulation of cardiac rate and force
- Maintains blood pressure and controls blood distribution



Endocrine System

- Transports O₂, hormones, and nutrients; eliminates CO₂ and metabolic wastes
- Various hormones regulate blood pressure
- Epinephrine elevates the heart rate and increases contractile force
- Erythropoietin regulates the production of red blood cells
- Estrogen maintains vascular health in women

Lymphatic System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Clotting response helps to restrict the spread of pathogens
- White blood cells and many plasma proteins are involved in immunity
- Maintains balanced amount of interstitial fluid within body tissues
- Spleen serves as a reservoir of red blood cells

Respiratory System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Provides O₂ to bloodstream and eliminates CO₂ at pulmonary alveoli of lungs
- Serves as a site of exchange for blood gases
- Thoracic pump aids venous return

Digestive System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Provides nutrients for blood formation, including iron and B vitamins
- Absorbs water and ions needed to maintain blood volume and pressure

Urinary System

- Transports O₂ and nutrients; eliminates CO₂ and metabolic wastes
- Blood pressure maintains kidney function
- Eliminates metabolic wastes from blood
- Helps to regulate blood volume and pressure
- Kidneys play a major role in erythropoietin production

Reproductive System

- Transports O₂, sex hormones, and nutrients; eliminates CO₂ and metabolic waste
- Local vasodilation causes physical changes during sexual arousal
- Estrogen maintains vascular health in women