

Internal Affairs

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

□ How Other Systems Work with the *Digestive System*

Integumentary System

- Provides lipids that help to insulate dermal and subcutaneous tissues
- Covers and protects the body
- Helps to synthesize vitamin D needed for calcium and phosphorus absorption in the small intestine

Skeletal System

- Absorbs calcium and phosphate ions for formation and maintenance of bone tissue
- Provides lipids for storage in yellow marrow
- Supports and protects certain digestive organs
- Stores calcium and phosphate ions
- Teeth and mandible important for mastication

Muscular System

- Provides nutrients for muscle contraction and maintenance
- Liver metabolizes lactic acid from active muscles
- Supports and protects certain digestive organs
- Assists the processing of food—preparing, chewing, swallowing, and intestinal motility
- Controls voluntary defecation

Nervous System

- Provides nutrients for neural function and maintenance
- Provides autonomic innervation to the GI tract
- Control over skeletal muscles regulates ingestion and defecation
- Hypothalamus contains centers for hunger, thirst, and satiation



Lymphatic System

- Provides nutrients for lymphatic function and maintenance
- Acids and enzymes secreted by the GI tract provide nonspecific defense against microbes
- Maintains a balanced amount of interstitial fluid within the digestive organs
- Protects the GI tract against infection

Respiratory System

- Provides nutrients for function and maintenance of the respiratory organs
- Pressure of digestive organs against the diaphragm aids expiration
- Provides O₂ and eliminates CO₂
- Valsalva's maneuver aids defecation

Urinary System

- Provides nutrients for function and maintenance of urinary organs
- Eliminates metabolic wastes
- Helps to maintain the body's pH, ion, and water balance
- Kidneys transform vitamin D to its active form

Endocrine System

- Provides nutrients for endocrine function and maintenance
- Liver deactivates hormones
- Pancreas contains hormone-producing cells
- Hormones regulate digestive activity

Circulatory System

- Provides nutrients for circulatory function and maintenance, including iron needed for hemoglobin synthesis
- Liver produces clotting proteins
- Liver excretes heme (as conjugated bilirubin)
- Transports O₂ and CO₂, nutrients, and fluids to and from the digestive organs

Reproductive System

- Provides nutrients for function and maintenance of reproductive organs
- Supports the development of an embryo and fetus
- Influences metabolic rates through effects of steroids
- Developing fetus may crowd digestive organs; heartburn and constipation are common during pregnancy