

# 14

PART A

# The Digestive System and Body Metabolism

PowerPoint® Lecture Slide Presentation by Jerry L. Cook, Sam Houston University



## ESSENTIALS OF HUMAN ANATOMY & PHYSIOLOGY

EIGHTH EDITION

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# The Digestive System and Body Metabolism

- Digestion
  - Breakdown of ingested food
  - Absorption of nutrients into the blood
- Metabolism
  - Production of cellular energy (ATP)
  - Constructive and degradative cellular activities

# Organs of the Digestive System

- Two main groups
  - Alimentary canal – continuous coiled hollow tube
  - Accessory digestive organs

# Organs of the Digestive System

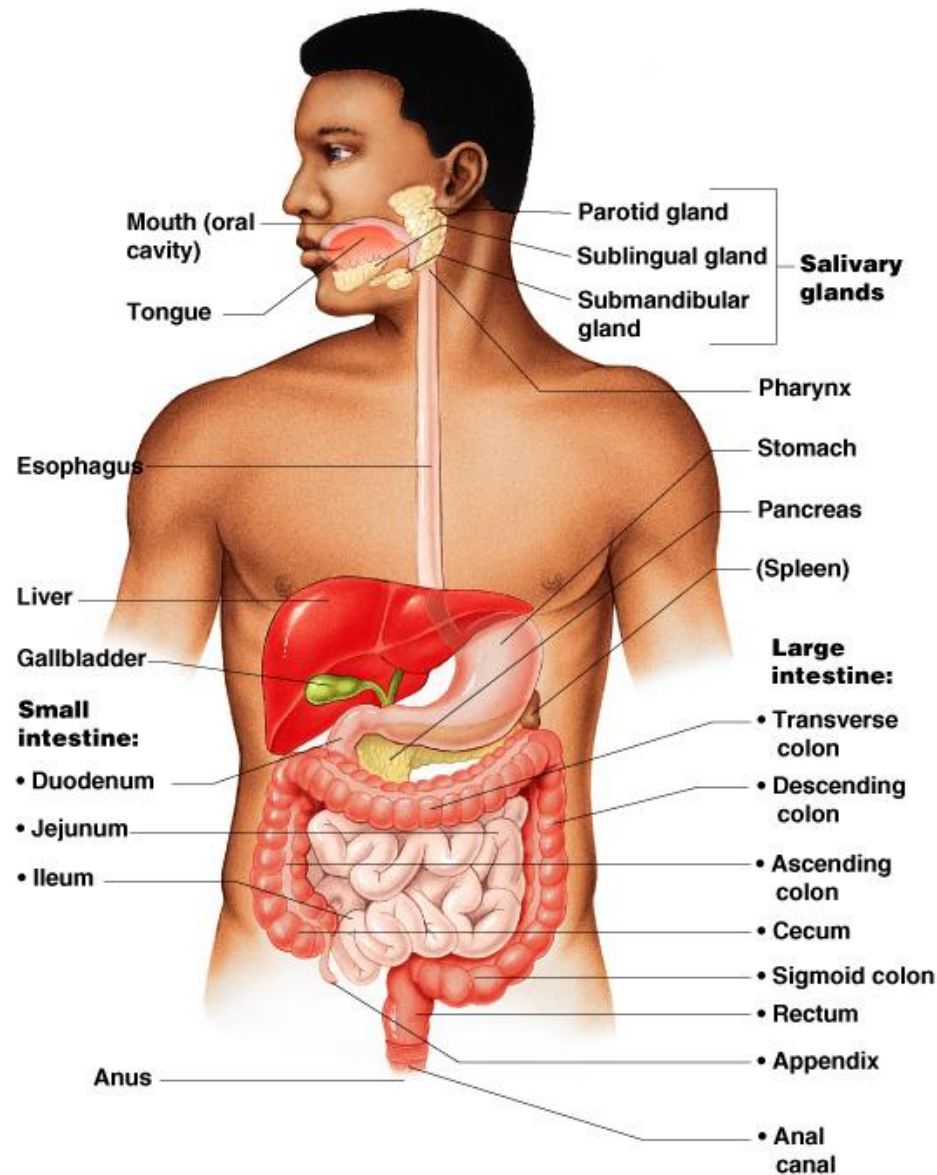


Figure 14.1

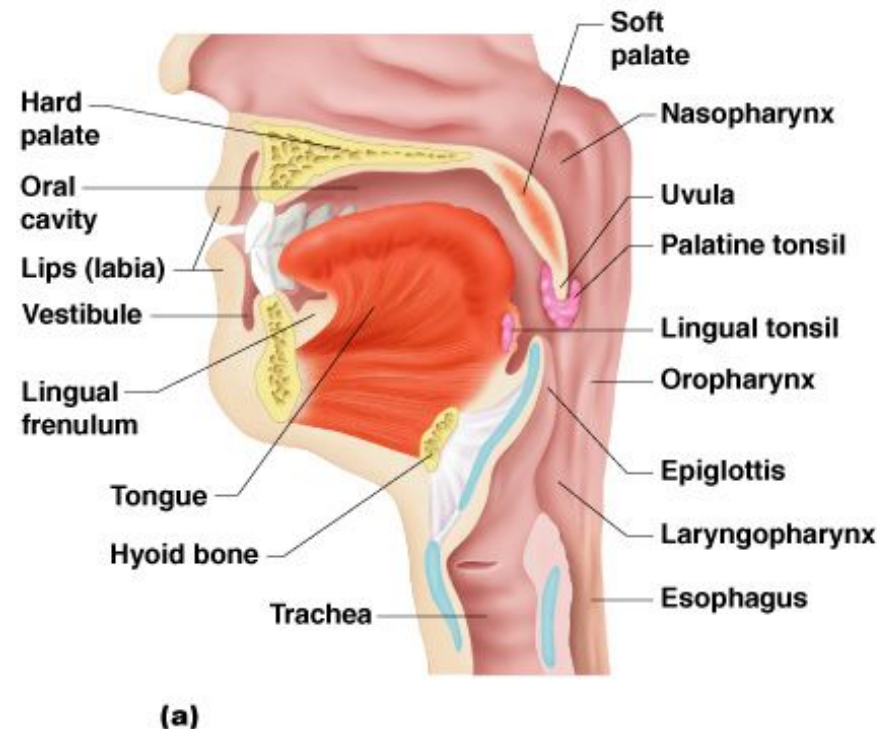
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# Organs of the Alimentary Canal

- Mouth
- Pharynx
- Esophagus
- Stomach
- Small intestine
- Large intestine
- Anus

# Mouth (Oral Cavity) Anatomy

- Lips (labia) – protect the anterior opening
- Cheeks – form the lateral walls
- Hard palate – forms the anterior roof
- Soft palate – forms the posterior roof
- Uvula – fleshy projection of the soft palate

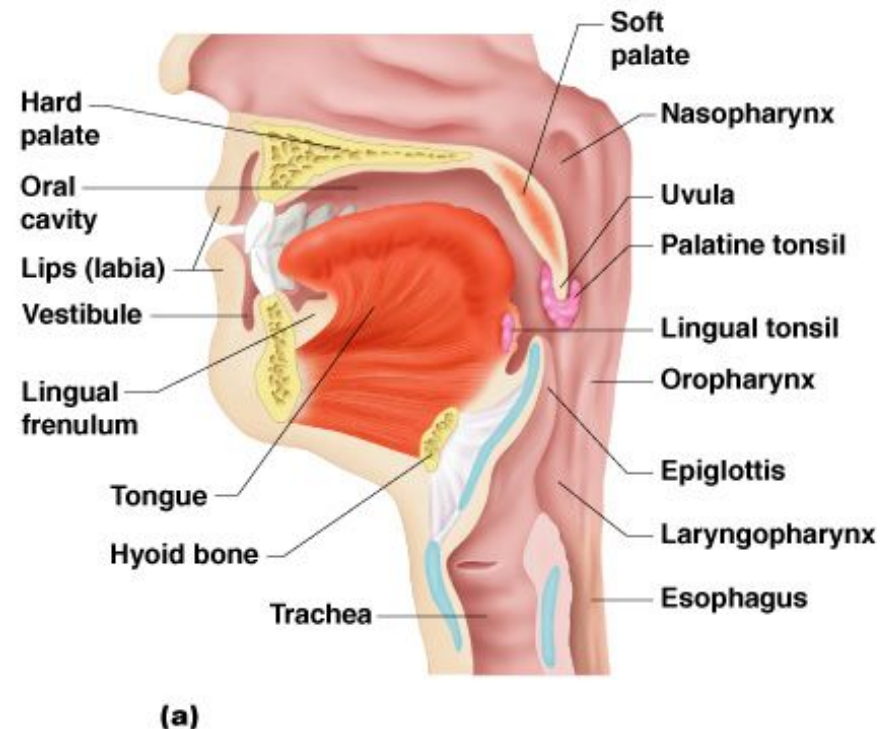


**Figure 14.2a**

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# Mouth (Oral Cavity) Anatomy

- Vestibule – space between lips externally and teeth and gums internally
- Oral cavity – area contained by the teeth
- Tongue – attached at hyoid and styloid processes of the skull, and by the lingual frenulum



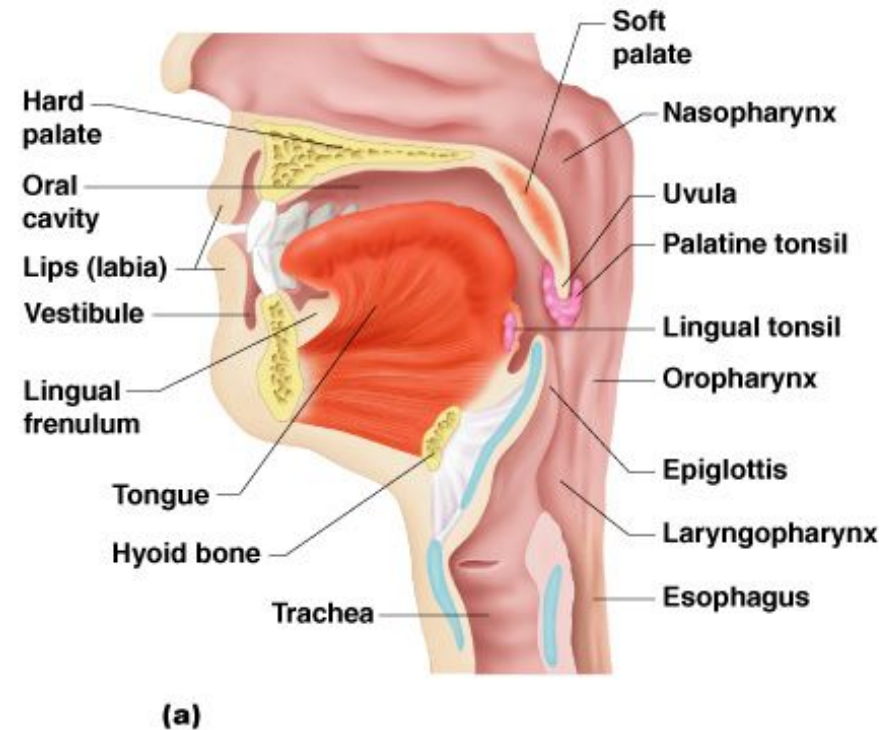
**Figure 14.2a**

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# Mouth (Oral Cavity) Anatomy

- Tonsils
  - Palatine tonsils
  - Lingual tonsil



**Figure 14.2a**

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# Processes of the Mouth

- Mastication (chewing) of food
- Mixing masticated food with saliva
- Initiation of swallowing by the tongue
- Allowing for the sense of taste

# Pharynx Anatomy

- Nasopharynx – not part of the digestive system
- Oropharynx – posterior to oral cavity
- Laryngopharynx – below the oropharynx and connected to the esophagus

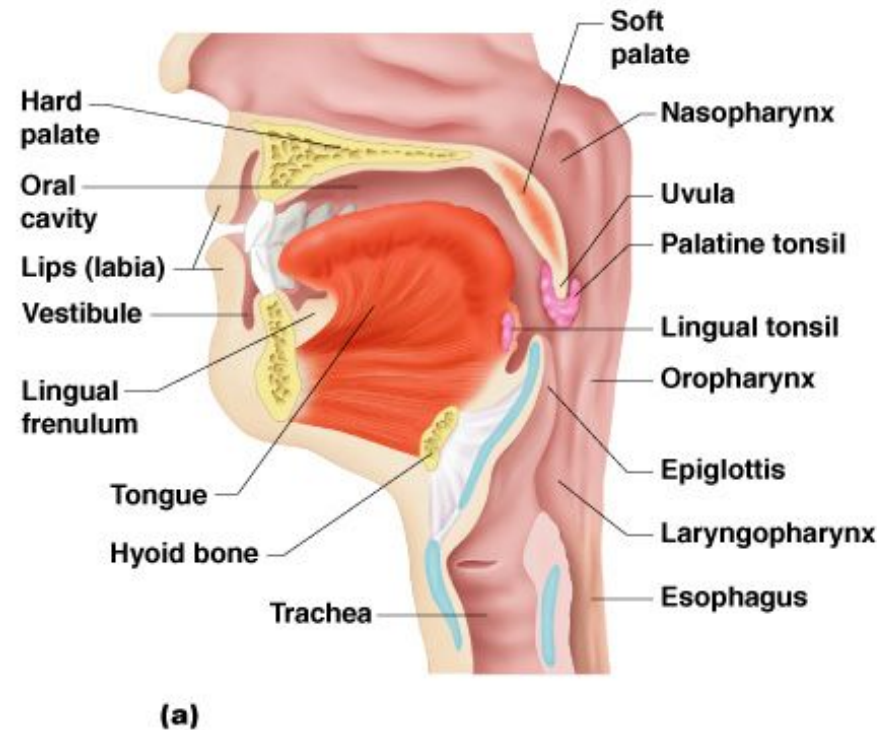


Figure 14.2a

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# Pharynx Function

- Serves as a passageway for air and food
- Food is propelled to the esophagus by two muscle layers
  - Longitudinal inner layer
  - Circular outer layer
- Food movement is by alternating contractions of the muscle layers (peristalsis)

# Esophagus

- Runs from pharynx to stomach through the diaphragm
- Conducts food by peristalsis (slow rhythmic squeezing)
- Passageway for food only (respiratory system branches off after the pharynx)

# Layers of Alimentary Canal Organs

- Mucosa
  - Innermost layer
  - Moist membrane
    - Surface epithelium
    - Small amount of connective tissue (lamina propria)
    - Small smooth muscle layer

# Layers of Alimentary Canal Organs

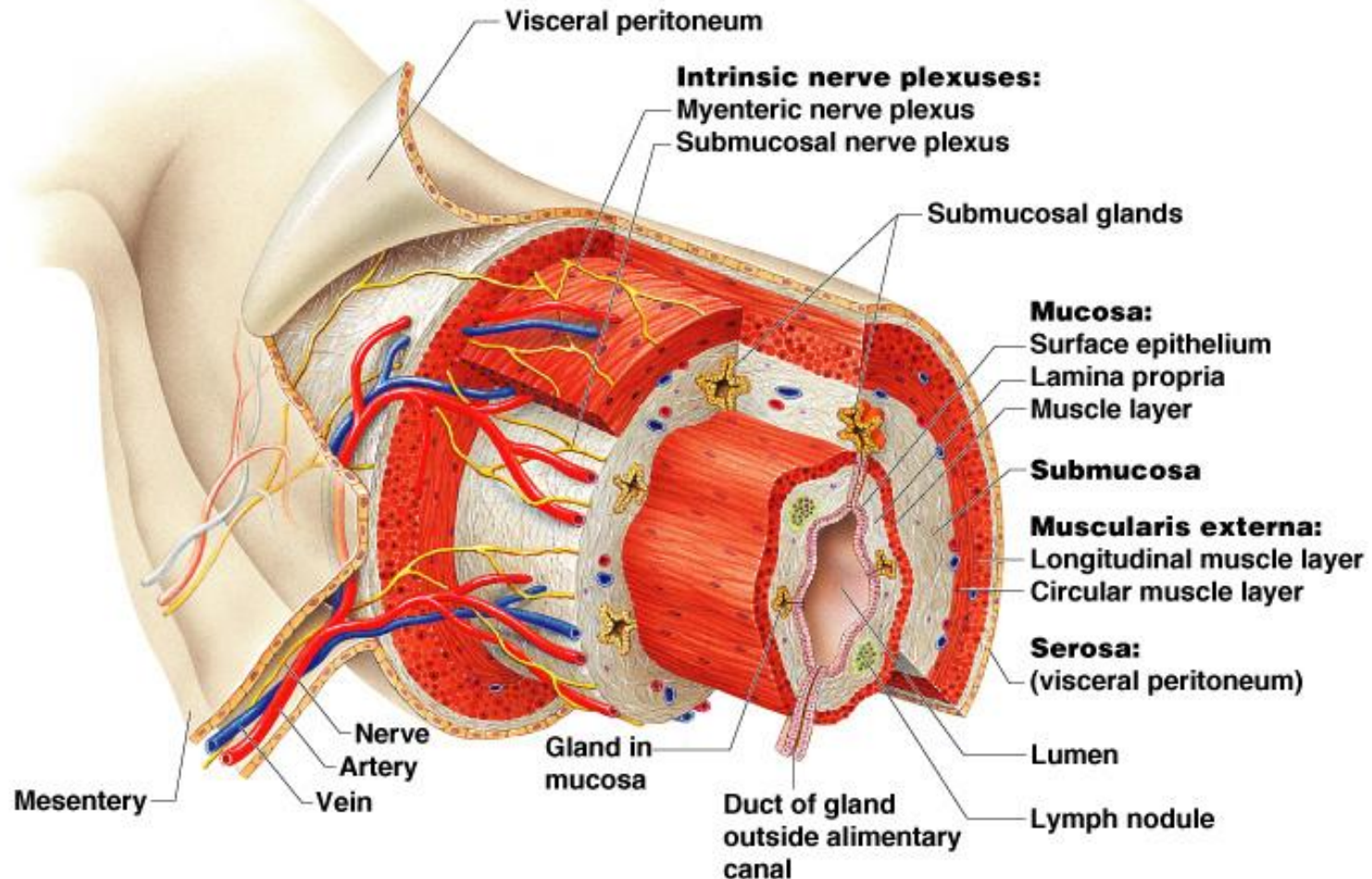
- Submucosa
  - Just beneath the mucosa
  - Soft connective tissue with blood vessels, nerve endings, and lymphatics

# Layers of Alimentary Canal Organs

- Muscularis externa – smooth muscle
  - Inner circular layer
  - Outer longitudinal layer
- Serosa
  - Outermost layer – visceral peritoneum
  - Layer of serous fluid-producing cells



# Layers of Alimentary Canal Organs



**Figure 14.3**

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# Alimentary Canal Nerve Plexuses

- All are part of the autonomic nervous system
- Three separate networks of nerve fibers
  - Submucosal nerve plexus
  - Myenteric nerve plexus
  - Subserous plexus