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PART A

The Digestive System

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 – mouth, pharynx, esophagus, stomach, small intestines, large intestines, anus
 - Accessory digestive organs- pancreas, liver, and gall bladder

Organs of the Digestive System

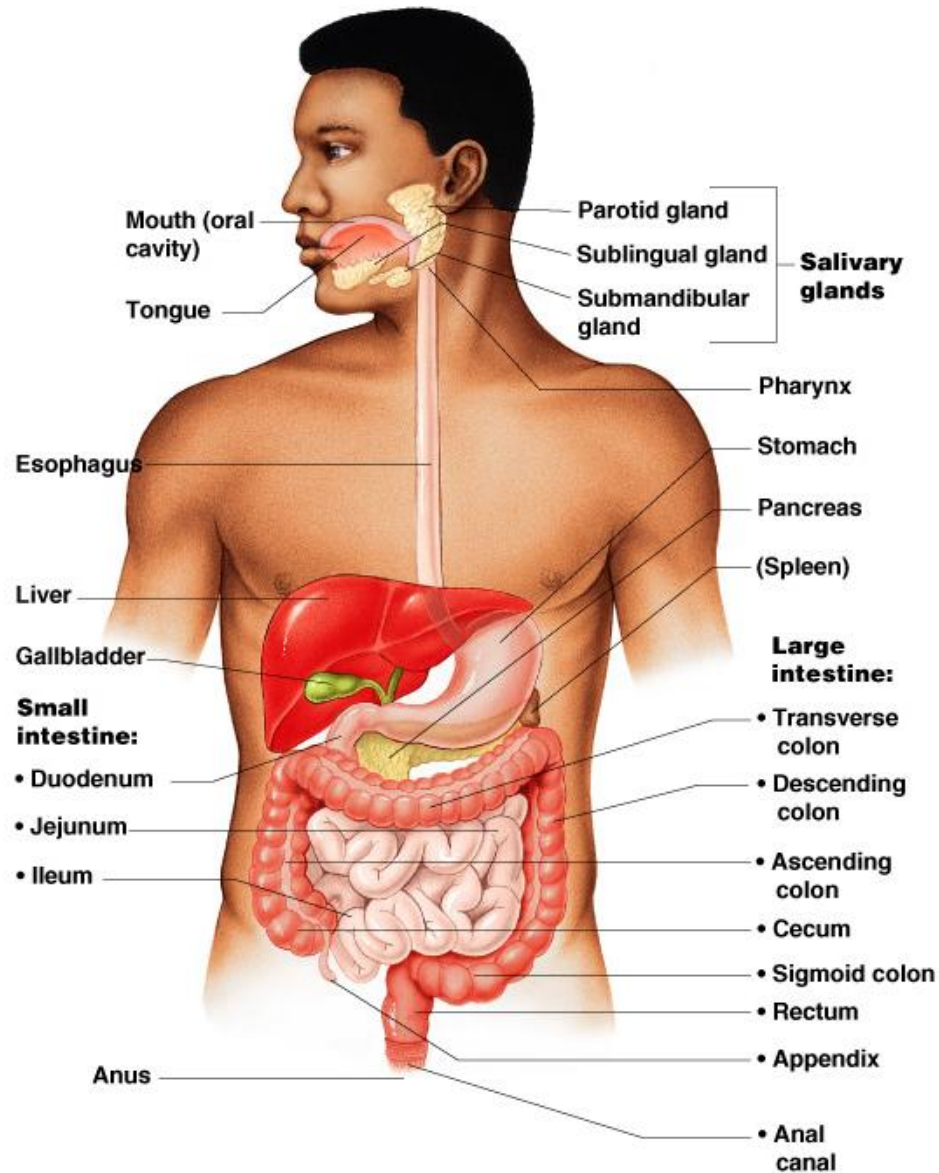


Figure 14.1

Teeth

- The role is to masticate (chew) food
- Humans have two sets of teeth
 - Deciduous (baby or milk) teeth
 - 20 teeth are fully formed by age two

Teeth

- Permanent teeth
 - Replace deciduous teeth beginning between the ages of 6 to 12
 - A full set is 32 teeth, but some people do not have wisdom teeth

Classification of Teeth

- Incisors – biting, chewing, chopping
- Canines/Cuspids – pointed teeth, tearing and shredding
- Premolars
- Molars - grinding

Classification of Teeth

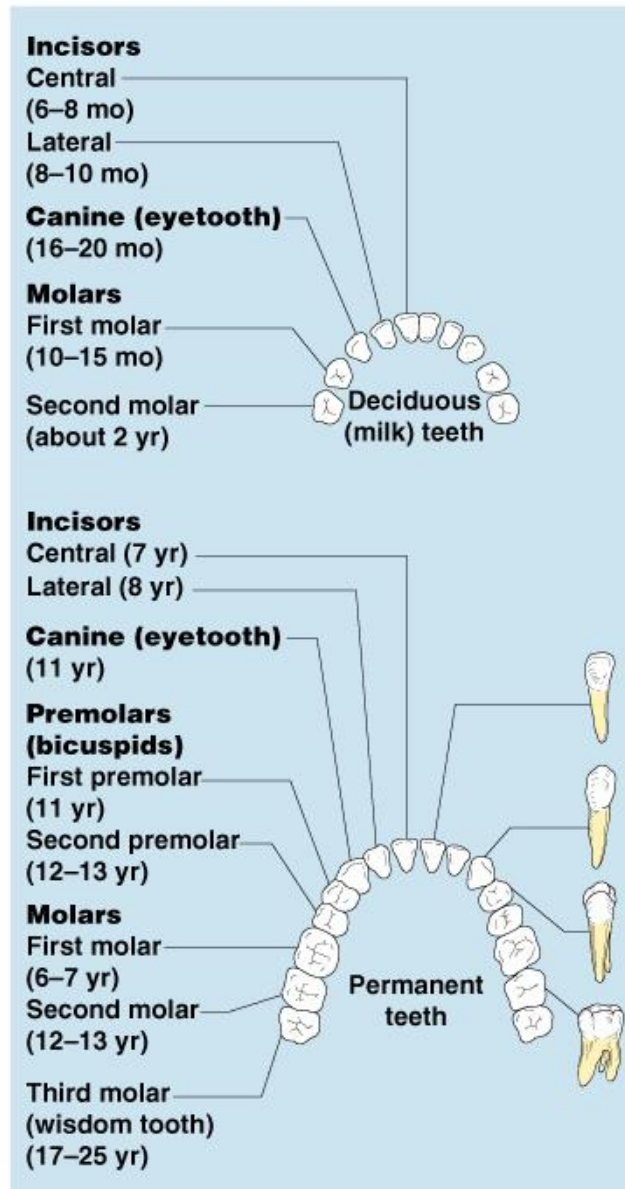


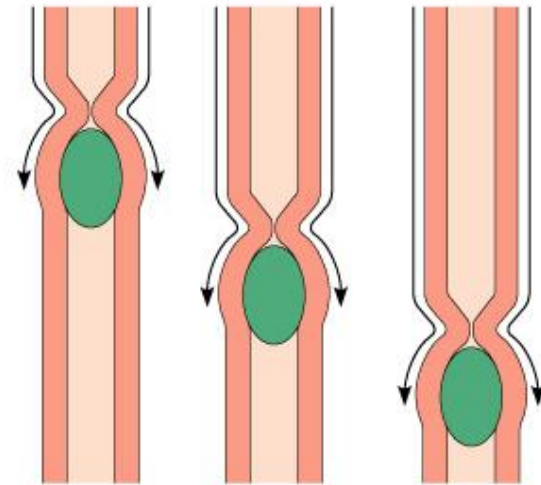
Figure 14.9

6 steps of Digestive

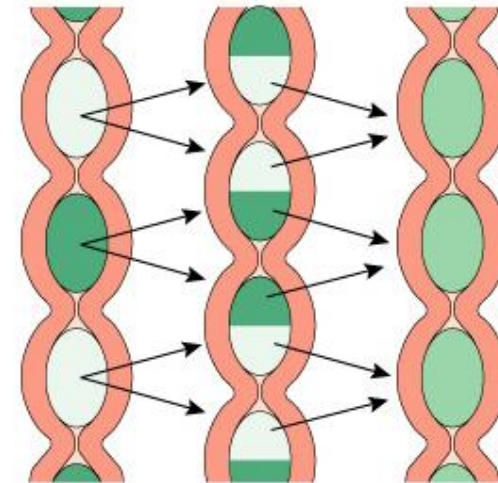
1. Ingestion – getting food into the mouth
2. Propulsion – moving foods from one region of the digestive system to another

Processes of the Digestive System

- Peristalsis – alternating waves of contraction
- Segmentation – moving materials back and forth to aid in mixing



(a)



(b)

Figure 14.12

Processes of the Digestive System

3. Mechanical digestion

- Begins with the mixing of food in the mouth by the tongue
- Churning of food in the stomach
- Segmentation in the small intestine

Processes of the Digestive System

4. Chemical Digestion – begins in the oral cavity

- Enzymes break down food molecules into their building blocks
- Each major food group uses different enzymes
 - Carbohydrates are broken to simple sugars
 - Proteins are broken to amino acids
 - Fats are broken to fatty acids and alcohols

Processes of the Digestive System

5. Absorption

- End products of digestion are absorbed in the blood or lymph
- The movement of nutrients through the walls of the digestive tract

6. Defecation

- Elimination of indigestible substances as feces

Processes of the Digestive System

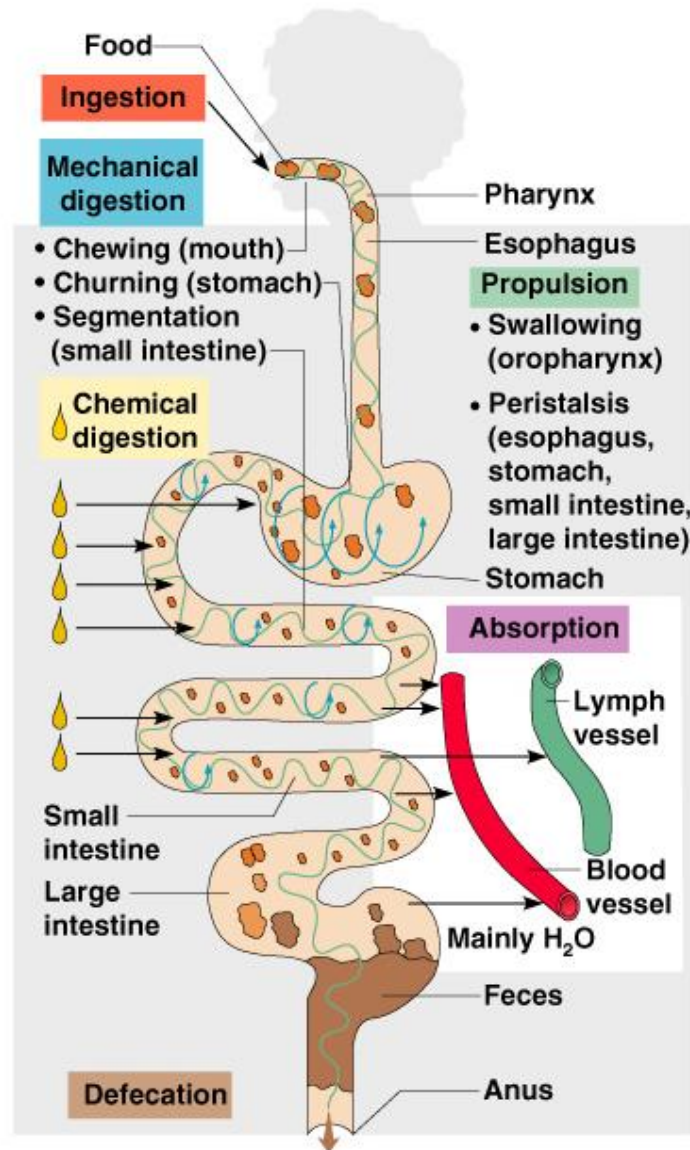


Figure 14.11

Enzymes of the Digestive System

- Pepsin – protein digestion in stomach
- Amylase – carbohydrate digestion in SI
- Trypsin – protein digestion in SI
- Lipase – lipid digestion in SI

Figure 14.11