Right lateral view of head and neck and anterior view of trunk
<table>
<thead>
<tr>
<th>Organ</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>pancreas</td>
<td>• Production of digestive enzymes that act on foods in small intestine;</td>
</tr>
<tr>
<td></td>
<td>• Production of the hormone insulin which regulates blood sugar;</td>
</tr>
<tr>
<td></td>
<td>• Storage of bicarbonate ions that neutralize stomach acid in small intestine</td>
</tr>
<tr>
<td>large intestine</td>
<td>• Absorption of water;</td>
</tr>
<tr>
<td></td>
<td>• Production of some vitamins;</td>
</tr>
<tr>
<td></td>
<td>• Storage of undigested food</td>
</tr>
<tr>
<td>Organ</td>
<td>Secretion and Function</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>liver</td>
<td><strong>bile</strong> - emulsifies fat</td>
</tr>
<tr>
<td>gall bladder</td>
<td><strong>bile</strong> - stores concentrated bile from liver</td>
</tr>
<tr>
<td>large intestine</td>
<td><strong>mucus</strong> - helps movement of food</td>
</tr>
</tbody>
</table>
Gastric pit

Lumen of stomach

Surface mucous cell

Lamina propria

Fundic mucosa

about 250x

Parietal cell

Chief cell

Figure 24-12c Principles of Anatomy and Physiology, 11/e
HISTOLOGY OF THE STOMACH

- Made up of the same 4 basic layers as the rest of the GI tract
- Presence of gastric glands (~ exocrine glands)
  - Secrete gastric juice
  - Contain 3 types of exocrine gland cells:
    - mucous neck cells – secretes mucous
    - parietal cells – secretes intrinsic factor (important for B₁₂ absorption),
    - chief cells – secretes digestive enzyme (pepsinogen)
REGULATION OF GASTRIC SECRETIONS

• Cephalic (reflex) phase:
  – prior to food entry
    • Sight or thought of food
    • Stimulation of taste or smell receptors

• Gastric phase:
  – once food enters the stomach
    • Stomach distension
    • Chemoreceptors by peptides, caffeine, and rising pH
    • Release of gastrin to the blood

• Intestinal phase
  – as partially digested food enters the duodenum
Fat globule

Emulsification

Nonpolar region

Polar (charged) regions

Bile salt

Fat droplets coated with bile salts are suspended in water
Anterior view of external anatomy

DUODENUM

JEJUNUM

ILEUM

Stomach

Large intestine

Figure 24-17a Principles of Anatomy and Physiology, 11/e
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Three-dimensional view of layers of the small intestine showing villi
• The mucosa is covered with finger-like villi (folds – infolding)
  – Which give the small bowel a large surface area for digestion and absorption

• Digestion of food takes place by:
  • The pancreatic enzymes in the pancreatic juice
  • The bile – emulsification of fats
• The mucosa also contains:
  – The intestinal glands (crypts of Lierberkuhn)
  • Secrete intestinal juice
  – Paneth cells
    • Secrete lysozyme (bactericidal enzyme)
  • Capable of phagocytosis
Figure 24-23c Principles of Anatomy and Physiology, 11/e

Portion of the wall of the large intestine

- Mucosa
- Submucosa
- Muscularis
- Serosa
- Lumen of large intestine
- Lamina propria
- Intestinal gland
- Muscularis mucosae
- Lymphatic nodule

LM 315x
Frontal section of anal canal

- Rectum
- Anal canal
- Internal anal sphincter (involuntary)
- External anal sphincter (voluntary)
- Anus
- Anal column
Regulation of Digestive Processes-Movement and Secretion

• Regulation by the GI hormones
  – GI hormones are secreted
    • by the endocrine cells of the intestine into the blood stream
  – 4 major hormones
    • Gastrin
      – Secreted from the antrum of the stomach
      – Actions:
        » Increases HCl secretion
        » Increases bile secretion
Most Common Types of Ulcers

- **Peptic Ulcer**
  - Any ulcer that is exposed to pepsin is referred to as peptic ulcers.
  - Peptic ulcers are found in the lining of your stomach or duodenum.

- **Gastric Ulcer**
  - A peptic ulcer is in the stomach

- **Duodenal Ulcer**
  - A peptic ulcer is in the duodenum
Right lateral view of head and neck and anterior view of trunk

- Parotid gland (salivary gland)
- Submandibular gland (salivary gland)
- Esophagus
- Mouth (oral cavity) contains teeth and tongue
- Sublingual gland (salivary gland)
- Pharynx
- Liver
- Duodenum
- Gallbladder
- Jejunum
- Ileum
- Ascending colon
- Cecum
- Appendix
- Stomach
- Pancreas
- Transverse colon
- Descending colon
- Sigmoid colon
- Rectum
- Anus