Human Body  The Digestive System – Part 2

KEY CONCEPT
- Nutrients are absorbed and solid wastes eliminated after digestion.

Digestion is only part of the process of maintaining the body’s health. The body also must absorb the nutrients to distribute them to all of the body’s cells, tissues, and organs. **Absorption** is the process by which nutrients move out of the digestive organs into the circulatory and lymphatic systems. The small intestine has three main structures that absorb most of the nutrients from chyme.

- Folded lining — The lining of the small intestine is ridged and folded to add more surface area and to slow the passage of food. Slower motion allows more time for absorption.
- Villi — Small, finger-like projections called villi cover the folded lining of the small intestine and provide more surface area to absorb nutrients.
- Microvilli — Every epithelial cell on the villi has thousands of tiny microvilli that add even more surface area to absorb nutrients.

Nutrients are absorbed in each of the three parts of the small intestine: duodenum, jejunum, and illeum. Nutrient-rich blood leaves the small intestine and enters the liver. In the liver, some nutrients are used to build more complex molecules, while others are stored for future use. The rest of the nutrients enter the circulatory system and are distributed to all the cells in the body.

The large intestine, or colon, processes solid wastes and absorbs water to help maintain the body’s fluid balance. Solid waste, called feces, is composed of undigested materials, bile pigments, and dead bacteria. The feces is stored in the rectum and eliminated through the anus. Some bacteria in the large intestine synthesize B and K vitamins. At times, harmful bacteria might overgrow beneficial bacteria, which can reduce water absorption and cause severe diarrhea.

1. What is absorption, and why is it such an important part of the digestive process? ______________________________________

2. Name the three structures in the small intestine that aid in the absorption of nutrients from chyme. __________________________

3. How do the three structures above aid in absorption of nutrients? _____________________________________________

4. Why is it important to move food slowly through the small intestine? ____________________________________________

5. What are the two main functions of the large intestine? _______________________________________________________

6. What materials make up the feces? _______________________________________________________________________

7. In what ways can bacteria in the large intestine be helpful and/or harmful? ________________________________

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**Complete the table by checking the correct column(s) for each function.**

<table>
<thead>
<tr>
<th>Function</th>
<th>Small Intestine</th>
<th>Large Intestine</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Water is absorbed</td>
<td></td>
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<tr>
<td>9. Mechanical digestion is completed.</td>
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<tr>
<td>10. Nutrients are absorbed.</td>
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<tr>
<td>11. Peristalsis happens.</td>
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<tr>
<td>12. Undigestable material is collected.</td>
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<tr>
<td>13. Bile and pancreatic juices are added.</td>
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<tr>
<td>14. Chemical digestion is completed.</td>
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</tr>
</tbody>
</table>
Label the following parts in the diagram of the digestive system below:

- Esophagus
- Mouth
- Rectum
- Large intestine
- Pancreas
- Small intestine
- Liver
- Pharynx
- Stomach

For the organs listed below, some are part of the alimentary canal—the one-way tube that food passes through as it travels through the body. Other organs are called accessory organs because they participate in digestion but food doesn’t actually pass through them. Write ‘AC’ for those organs that are part of the alimentary canal and write ‘AO’ for those that are accessory organs.

- 24. Esophagus
- 25. Gallbladder
- 26. Large intestine
- 27. Liver
- 28. Mouth
- 29. Pancreas
- 30. Pharynx
- 31. Rectum
- 32. Salivary glands
- 33. Small intestine
- 34. Stomach

Concept Map

Using the information you have learned, complete the concept map below.

1. Uses mechanical and chemical means to begin digestion with chewing and saliva excretions
2. Uses mechanical and chemical means to transfer chewed food to the stomach
3. Uses mechanical and chemical means to produce enzymes and bile for chemical digestion
4. Uses chemical means and absorption to complete chemical digestion and absorb nutrients from chyme
5. Uses chemical means and absorption to large intestine
6. Absorption to large intestine