1. Endocrine Glands
   a. Label the endocrine glands in the figure by placing the number of the gland in the space beside the correct label.

   b. Contrast exocrine and endocrine glands.
      1) Secretions of exocrine glands are carried by **Ducts**.
      2) Secretions of endocrine glands are carried by **The blood**.

2. The Nature of Hormones
   a. Match the hormone with the correct statement.
      1) Steroid hormone
         2) Nonsteroid hormone
         2) Binds to a plasma membrane receptor.
         2) Receptor-hormone complex causes DNA to initiate synthesis of new proteins (enzymes).
         2) Requires a second messenger.
         1) Fat-soluble hormone.
         1) Binds to receptor within the target cells.
b. Write the terms that match the statements in the spaces at the right.

1) Chemical messengers.  
2) Carries hormones throughout the body.  
3) Glands producing hormones.  
4) Cells containing hormone receptors.  
5) Excessive production of a hormone.  
6) Deficient production of a hormone.  
7) Usual regulatory mechanism for hormone production.  
8) Local “hormones” produced by nonendocrine cells.

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<tr>
<td><strong>Blood</strong></td>
<td><strong>Endocrine</strong></td>
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<tr>
<td><strong>Hormones</strong></td>
<td><strong>Target cells</strong></td>
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<tr>
<td><strong>Hypersecretion</strong></td>
<td><strong>Hypossecretion</strong></td>
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<tr>
<td><strong>Negative feedback control</strong></td>
<td><strong>Prostaglandins</strong></td>
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3. Pituitary Gland

a. Write the names of the pituitary hormones that match the statements in the spaces at the right.

1) Stimulates secretion of thyroid hormone.  
2) Stimulates cell growth and division.  
3) Stimulates secretion of estrogens.  
4) Stimulates secretion of testosterone.  
5) Stimulates secretion of cortisol.  
6) Stimulates sperm production.  
7) Stimulates water retention by kidneys.  
8) Stimulates contraction of uterus.  
9) Stimulates secretion of progesterone.  
10) Causes the onset of puberty.

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<tbody>
<tr>
<td><strong>Thyroid-stimulating hormone</strong></td>
<td><strong>Growth hormone</strong></td>
</tr>
<tr>
<td><strong>Follicle-stimulating hormone</strong></td>
<td><strong>Luteinizing hormone</strong></td>
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<tr>
<td><strong>Luteinizing hormone</strong></td>
<td><strong>Adrenocorticotropic hormone</strong></td>
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<tr>
<td><strong>Follicle-stimulating hormone</strong></td>
<td><strong>Antidiuretic hormone</strong></td>
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<td><strong>Oxytocin</strong></td>
<td><strong>Luteinizing hormone</strong></td>
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<tr>
<td><strong>Follicle-stimulating hormone</strong></td>
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b. Match the lobe with the hormone it produces.

1) Anterior lobe  
2) Posterior lobe

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<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 ACTH</td>
<td>Progesterone</td>
</tr>
<tr>
<td>2 Oxytocin</td>
<td>FSH and LH</td>
</tr>
<tr>
<td>1 TSH</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>ADH</td>
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</tbody>
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4. Thyroid and Parathyroid Glands

Write the terms that match the statements in the spaces at the right.

1) Element essential for activity of thyroxine.  
2) Hormone that increases metabolic rate.  
3) Hormone that increases blood calcium.  
4) Hormone whose secretion is controlled by TSH.  
5) Hormone that decreases blood calcium.  
6) Gland that secretes calcitonin.  
7) Controls secretion of parathyroid hormone.

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<tr>
<td><strong>Iodine</strong></td>
<td><strong>Thyroid hormone</strong></td>
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<td><strong>Parathyroid hormone</strong></td>
<td><strong>Thyroid hormone</strong></td>
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<tr>
<td><strong>Parathyroid hormone</strong></td>
<td><strong>Thyroid hormone</strong></td>
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<tr>
<td><strong>Blood calcium level</strong></td>
<td><strong>Blood calcium level</strong></td>
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</table>
5. Adrenal Glands
Write the terms that match the statements in the spaces at the right.

1) Converts glycogen into glucose. ____________________________
   - Epinephrine
2) Controls secretion of adrenal medulla. ____________________________
   - Sympathetic division
3) Two related hormones secreted by the adrenal medulla. ____________________________
   - Epinephrine
   - Norepinephrine
4) Three groups of hormones secreted by adrenal cortex. ____________________________
   - Mineral corticoids
   - Glucocorticoids
5) Controls levels of electrolytes in blood. ____________________________
   - Aldosterone
6) Inhibits inflammation; depresses immunity. ____________________________
   - Cortisol
7) Secretion controlled by blood levels of sodium and potassium. ____________________________
   - Aldosterone
   - Epinephrine
8) Prepares body to meet emergencies. ____________________________
   - Aldosterone
9) Increases blood levels of sodium and water. ____________________________
   - Cortisol
10) Converts noncarbohydrates into glucose. ____________________________
11) Increases heart rate and blood pressure. ____________________________
12) Secretion controlled by ACTH. ____________________________

6. Pancreas
Write the terms that match the statements in the spaces at the right.

1) Portion of gland secreting hormones. ____________________________
   - Islets of Langerhans
2) Hormone decreasing blood glucose. ____________________________
   - Insulin
3) Hormone aiding movement of glucose into cells. ____________________________
   - Insulin
4) Hormone increasing blood glucose. ____________________________
   - Glucagon
5) Controls secretion of pancreatic hormones. ____________________________
   - Blood glucose level
6) Secretion stimulated by high glucose levels. ____________________________
   - Insulin

7. Gonads, Pineal and Thymus Glands
Write the terms that match the statements in the spaces at the right.

1) Hormones formed by ovaries. ____________________________
   - Estrogen
   - Progesterone
2) Hormone secreted by testes. ____________________________
   - Testosterone
3) Hormone of the pineal gland. ____________________________
   - Melatonin
4) Hormone of the thymus gland. ____________________________
   - Thymosin
5) Seems to influence biorhythms. ____________________________
   - Melatonin
6) Stimulates development of male sex organs and secondary sexual characteristics. ____________________________
   - Testosterone
7) Stimulates development of female sex organs and secondary sexual characteristics. ____________________________
   - Estrogen
   - Thymosin
8) Involved in maturation of T lymphocytes. ____________________________

101
8. Disorders of the Endocrine System

Write the names of the disorders described below in the spaces at the right.

1) Hypersecretion of GH in adults.
2) Production of large amounts of dilute urine.
3) Enlarged thyroid due to lack of iodine.
4) Excessive metabolic rate and bulging eyes.
5) Hyposecretion of thyroid hormone in adults.
6) Hyposecretion of GH in growing years.
7) Hyposecretion of aldosterone and cortisol.
8) Hypersecretion of glucocorticoids.
9) Hyposecretion of ADH.
10) Continued growth of bones of face and hands.
11) Inability of glucose to enter body cells.
12) Hypersecretion of thyroxine.
13) Mental retardation, sluggishness, and stunted growth in an infant.
14) Coarse, dry skin and hair; edema; and sluggishness in adult.
15) Round, full face; high blood pressure; high blood glucose; and decreased immunity.

9. Clinical Applications

a. A patient is taken to the emergency room by her husband. She is sweating and breathing rapidly. A blood test reveals acidosis and hyperglycemia. What hormone should be administered immediately? Explain. Without adequate insulin, glucose cannot enter body cells for use in cellular respiration. This produces hyperglycemia and forces cells to use fats for cellular respiration which results in acidosis.

b. A new mother is informed that her baby has severe hypothyroidism. How would you explain the importance of thyroxine medication for her infant? A normal level of thyroxine is essential for normal physical and mental development. A thyroxine deficiency will result in mental retardation and impaired development.

c. A patient with high blood pressure and edema (water-logged tissues) is given a drug that counteracts the action of ADH. Explain why this drug was administered and how it will work. It is a diuretic that promotes the excretion of water which will decrease blood volume and enable removal of excess interstitial fluid.