Endocrine System
Study Guide, Chapter 23

Part I. Clinical Applications

1. Pete is very short for his chronological age of 8. What hormone levels should be checked to determine if he has pituitary dwarfism?

2. A young girl is brought to the clinic by her father. The girl fatigues easily and seems mentally sluggish. You notice a slight swelling in the anterior neck. What condition do you suspect? What is a possible cause and treatment?

3. Mrs. Jackson claims she is not menstruating and reports that her breasts are producing milk although she has never been pregnant. What hormone is being hypersecreted?

4. A friend of yours just found out he has diabetes. Being the caring inquisitive person that you are, you ask what type of diabetes he has. He is not sure and didn't realize that there are different types of the disorder. Explain the different types of diabetes.
Part I

The following terms are to be used throughout the study guide. Terms may be used more than once or not at all. There may be times when none of the terms fit and you will need to refer to notes or book.

Abdominopelvic cavity
Acini
Adenohypophysis
Adrenal cortex
Adrenal gland
Adrenal medulla
Aldosterone
Antidiuretic (ADH)
Calcitonin
Capillaries (blood)
Chief (principal)
Cortex
Diabetes insipidus
Diabetes mellitus
Ducts
Endocrine
Epinephrine
Follicular
Gigantism
Glucocorticoids
Glucagon
Hormones
Infundibulum
Inhibiting hormones
Insulin
Islets of Langerhans
Isthmus
Master
Melatonin
Mineral corticoids
Nervous
Neurohypophysis
Neurosecretory
Norepinephrine
Oxyphil
Oxytocin
Pancreatic islets
Parafollicular
Parathyroid
Parathyroid hormone (PTH)
Pineal
Pituitary gland
Promote
Receptors
Releasing hormones
Reticularis
Sella turcica
Sodium
Surface
Target
Thyroid gland
Thyroxin (T4)
Triiodothyronine (T3)
Trachea
Tropic
Tropic hormones
Water

1. The two regulatory systems of the body are the ______________ and the ______________. The former controls homeostasis via neurons, while the latter releases chemical messenger molecules, called ______________.

2. Exocrine glands secrete their products into ______________ or to the outer ______________ of the body, whereas the endocrine glands release their secretions into the extracellular space and then into the ______________.

3. List the five (exclusive) endocrine glands named in the textbook.
   a. 
   b. 
   c. 
   d. 
   e. 

4. A given hormone will travel throughout the body via the circulatory system. It affects only specific cells called ______________ cells. These cells are influenced by binding of hormones to large protein or glycoprotein molecules called ______________.

5. The pituitary has the nickname the “______________” gland because it secretes several hormones that control other endocrine glands. Located in the sella turcica, the pituitary gland is (anterior? posterior?) to the optic chiasma.

6. The (pars intermedia? infundibulum?) is a stalklike structure that attaches the pituitary gland to the hypothalamus.

7. Melatonin is secreted by the ______________ gland.
8. The pituitary gland is divided structurally and functionally into an anterior lobe called the _______ and a posterior lobe referred to as the _______.

9. Release of anterior pituitary hormones is stimulated by _______ and suppressed by _______. _______ from the hypothalamus.

Match the glandular cell with its secretion.

<table>
<thead>
<tr>
<th>Corticotroph cells</th>
<th>Gonadotroph cells</th>
<th>Lactotroph cells</th>
<th>Somatotroph cells</th>
<th>Thyrotroph cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. human growth hormone (hGH)</td>
<td>11. luteinizing hormone (LH)</td>
<td>12. thyroid-stimulating hormone (TSH)</td>
<td>13. prolactin (PRL)</td>
<td>15. follicle-stimulating hormone (FSH)</td>
</tr>
</tbody>
</table>

16. A _______ hormone is one that influences another endocrine gland.

The neurohypophysis does not synthesize hormones; rather, it stores hormones produced by _______ cells of the hypothalamus. The two hormones stored in the posterior pituitary gland are _______ hormone and _______.

**Thyroid Gland**

18. The thyroid gland is located inferior to the larynx and has two lobes connected by a mass called the _______. The gland has an excellent blood supply, receiving about _____ to _____ ml of blood per minute.

19. Name the two types of cells associated with the thyroid follicles and the hormones they secrete.

<table>
<thead>
<tr>
<th>Cell</th>
<th>Hormone(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
</tr>
</tbody>
</table>
Parathyroid Glands

20. The parathyroid glands are attached to the (anterior? posterior?) surfaces of the lateral lobes of the thyroid gland. The two types of cells contained in the parathyroid glands are ____________ and ____________ cells.

Adrenal (Suprarenal) Glands

21. The adrenal glands are structurally and functionally divided into two regions: the outer ____________ and the inner ____________

22. The outer region of the adrenal gland is subdivided into three zones. Complete the table below by matching the zone with its hormone grouping.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Hormone Grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Glomerulosa</td>
<td></td>
</tr>
<tr>
<td>b. Fasciculata</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Gonadocorticoids</td>
</tr>
</tbody>
</table>

23. The cells of the adrenal medulla are called ____________ cells. These cells are directly innervated by preganglionic cells of the (parasympathetic? sympathetic?) division of the ANS.

24. The two principal hormones synthesized by the adrenal medulla are ____________ and ____________.

Pancreas

25. The endocrine portion of the pancreas consists of cell clusters called ____________.

26. The exocrine portion of the pancreas is formed by clusters of cells called ____________, which are responsible for the secretion of digestive enzymes.

Pineal Gland (Epiphysis Cerebri)

27. Where is the pineal gland located?

28. One hormone secreted by the pineal gland is ____________, which is liberated during darkness and is thought to ____________ sleep.
Part III

1. An example of a gland in the body that functions as a neural tissue and an endocrine tissue is the ________.

2. The hypophysis lies nestled within a depression in the sphenoid bone called the ________.

3. The pituitary gland is connected to the hypothalamus by a slender, funnel-shaped structure called the ________.

4. The hypothalamic neurons of the posterior lobe of the pituitary gland manufacture ________ and ________.

5. Because they turn on endocrine glands or support the functions of other organs, the hormones of the anterior lobe are called ________.

6. Underproduction of ADH by the posterior lobe of the pituitary gland results in a condition called ________.

7. Overproduction of GH by the anterior lobe of the pituitary gland results in a condition called ________.

8. The two lobes of the thyroid gland are united by a slender connection, ________.

9. The thyroid gland curves across the anterior surface of the ________.

10. The hormone produced by the C cells of the thyroid gland that causes a decrease in Ca^{2+} concentrations in body fluids is ________.

11. The two pairs of parathyroid glands are embedded in the posterior surfaces of the ________.

12. The hormone secreted by the chief cells of the parathyroid gland that causes an increase in Ca^{2+} concentrations in body fluids is ________.

13. The superficial portion of the adrenal glands is the ________.

14. The principal mineralocorticoid produced by the adrenal cortex is ________.

15. The hormonal effect of aldosterone in the kidneys is to increase reabsorption of ________.

16. The endocrine pancreas consists of cell clusters known as the ________.

17. The pancreas lies within the ________.

18. A peptide hormone released by beta cells when glucose levels exceed normal is ________.

19. The hormone released by alpha cells that raises blood glucose levels is ________.

20. An underproduction of insulin by the endocrine pancreas causes a condition known as ________.

21. The specialized cells in the parathyroid glands that secrete ________.

   a. chief cells
   b. C cells
   c. follicular epithelial cells
   d. cells of the pars distalis
22. The most notable effect of ADH produced in the neurohypophysis of the pituitary gland is to:
   a. increase the amount of water lost at the kidneys
   b. decrease the amount of water lost at the kidneys
   c. stimulate the contraction of uterine muscles
   d. increase or decrease calcium ion concentrations in body fluids

23. Stimulation of contractile cells in mammary tissue and uterine muscles in the female is initiated by secretion of:
   a. oxytocin from the posterior pituitary
   b. melatonin from the pineal gland
   c. oxytocin from the adenohypophysis
   d. melatonin from the neurohypophysis

24. The pituitary gland is connected to the hypothalamus by a slender, funnel-shaped structure called the:
   a. hypophysis
   b. sella turcica
   c. adenohypophysis
   d. infundibulum

25. The hormonal effect(s) of ADH produced by the neurohypophysis is (are):
   a. reabsorption of water
   b. elevation of blood volume
   c. elevation of blood pressure
   d. a, b, and c are correct

26. When the posterior lobe of the pituitary gland no longer releases adequate amounts of ADH, the result is development of:
   a. hypergonadism
   b. diabetes insipidus
   c. decreased urine production
   d. decreased blood glucose levels

27. The adrenal cortex consists of a:
   a. posterior, anterior, and lateral lobe
   b. zona glomerulosa, zona fasciculata, zona reticularis
   c. pars tuberalis, pars distalis, pars intermedia
   d. C cell population, chief cells, oxyphils

28. The net result of parathyroid hormone (PTH) secretion is:
   a. it inhibits the reabsorption of Ca$^{2+}$ at the kidneys
   b. it increases the rate of calcium deposition in bone
   c. it increases Ca$^{2+}$ concentration in body fluids
   d. it increases the urinary output and losses

29. The pinealocytes of the pineal gland produce the hormone melatonin, which is believed to:

30. Which gland is responsible for the secretion of thyroid-stimulating hormone?
   A. thyroid
   B. hypothalamus
   C. anterior pituitary
   D. posterior pituitary
   E. A and D are correct

31. Exocrine glands release their secretions into a duct or onto a surface, whereas endocrine glands secrete into:
   A. muscle tissue
   B. open cavities
   C. closed cavities
   D. extracellular space around the secretory cells
   E. none of the above are correct

32. Antidiuretic hormone and oxytocin are produced by the:
   A. anterior pituitary
   B. posterior pituitary
   C. parathyroid glands
   D. hypothalamus
   E. A and D are correct

33. Giantism is associated with hypersecretion of a hormone from the:
   A. anterior pituitary
   B. thyroid
   C. adrenals
   D. posterior pituitary
   E. testes

34. Thyroxine production is dependent upon adequate dietary intake of which ion?
   A. calcium
   B. potassium
   C. iodine
   D. magnesium
   E. sodium

35. If an individual has type I diabetes mellitus, which pancreatic cells are involved with this disorder?
   A. delta
   B. alpha
   C. beta
   D. F-cells
   E. none of the above are correct

36. Which of the following is a gonadotropin?
   A. ACTH
   B. FSH
   C. PRL
   D. MSH
   E. hGH

37. The principal hormone secreted by the cells of the zona glomerulosa is ________
   (Hint: It is a mineralocorticoid.)
   A. cortisol
   B. aldosterone
   C. estrogen
   D. androgens
   E. C and D are both correct