

Endocrine System

Chapter

14

Answer Key: Textbook page references are provided as a guide for answering these questions. A complete answer key was provided for your instructor.

OBJECTIVES

- List the functions of the endocrine system.
- Discuss the role and function of hormones in the body, including:
 - Define *hormone*.
 - Explain the process by which hormones bind to the receptor sites of specific tissues (targets).
 - Explain the three mechanisms that control the secretion of hormones.
- Discuss the pituitary gland, including:
 - Describe the relationship of the hypothalamus to the pituitary gland.
 - Describe the location, regulation, and hormones of the pituitary gland.
- Identify the other major endocrine glands and their hormones, and explain the effects of hyposecretion and hypersecretion.

- _____ Type of glands that secrete into ducts (e.g., sweat glands, sebaceous glands)
- _____ Hormones that are "aimed at" a target
- _____ Describes this pattern of hormone secretion: cortisol secretion is highest in the morning (8 AM), lowest in the evening (midnight).
- _____ Endocrine secretions that are classified as proteins, protein-like substances, or steroids
- _____ Describes a specific tissue or organ to which a hormone binds
- _____ Describes, for example, this sequence of events: corticotropin-releasing hormone (CRH) stimulates the release of adrenocorticotrophic hormone (ACTH), which in turn stimulates the secretion of cortisol; as the blood level of cortisol increases, it shuts off the further secretion of ACTH and CRH.

Part I: Mastering the Basics

MATCHING

Hormone Action

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 259-263.

- | | |
|------------------------------|------------------------------|
| A. target tissue (organ) | G. biorhythm(s) |
| B. receptor(s) | H. tropic hormones |
| C. hormones | I. second chemical messenger |
| D. endocrine glands | J. positive feedback control |
| E. exocrine glands | |
| F. negative feedback control | |

- _____ An example is a circadian rhythm.
- _____ Jet lag and night shift work alter this pattern of hormone secretion.
- _____ A self-amplification cycle ("give me more") in which a change is the stimulus for an even greater change in the same direction
- _____ Hormones bind to these special areas in the cell or on the surface of the cell membrane of the target tissue.
- _____ An example is the menstrual cycle.
- _____ Cyclic adenosine monophosphate (cAMP)

- _____ Type of glands that secrete hormones; called *ductless glands*

MATCHING**Glands**

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 263-277.

- | | |
|------------------------------|-----------------------|
| A. thyroid gland | F. pineal gland |
| B. anterior pituitary gland | G. parathyroid glands |
| C. posterior pituitary gland | H. adrenal cortex |
| D. hypothalamus | I. adrenal medulla |
| E. pancreas | J. ovaries |
| | K. testes |
| | L. thymus gland |

1. _____ Beta and alpha cells of the islets of Langerhans
2. _____ Gonads that secrete estrogen and progesterone
3. _____ Secretes T_3 , T_4 , and calcitonin
4. _____ Secretes releasing hormones
5. _____ Secretes antidiuretic hormone (ADH) and oxytocin
6. _____ Called the *neurohypophysis*
7. _____ The hypothalamus and this gland are parts of the hypothalamic-hypophyseal portal system.
8. _____ Called the *adenohypophysis*
9. _____ Secretes tropic hormones such as thyroid-stimulating hormone (TSH), ACTH, growth hormone (somatotropic hormone), and the gonadotropins
10. _____ Secretes the catecholamines, epinephrine, and norepinephrine
11. _____ Secretes the steroids—glucocorticoids, mineralocorticoids, and androgens
12. _____ Target gland for ACTH
13. _____ Low plasma levels of calcium stimulate these glands to secrete parathyroid hormone (PTH).
14. _____ Secretes insulin and glucagon
15. _____ Uses iodine to synthesize its hormones

16. _____ Target gland of TSH
17. _____ Secretions of this gland contribute to the sympathetic fight-or-flight response.
18. _____ The gonad that secretes testosterone
19. _____ This gland is associated with these words: *isthmus, follicular cells, colloid, and iodine*.
20. _____ This gland plays an important role in immunity and involutes, or shrinks, after puberty.
21. _____ Secretes the hormones that are concerned with sugar, salt, and sex
22. _____ A cone-shaped gland located in the brain; secretes melatonin; called the *biological clock*
23. _____ Gland that enlarges as a goiter
24. _____ Glands that are sometimes embedded within the thyroid gland; removal causes hypocalcemic tetany.

MATCHING**Hormones**

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 263-277.

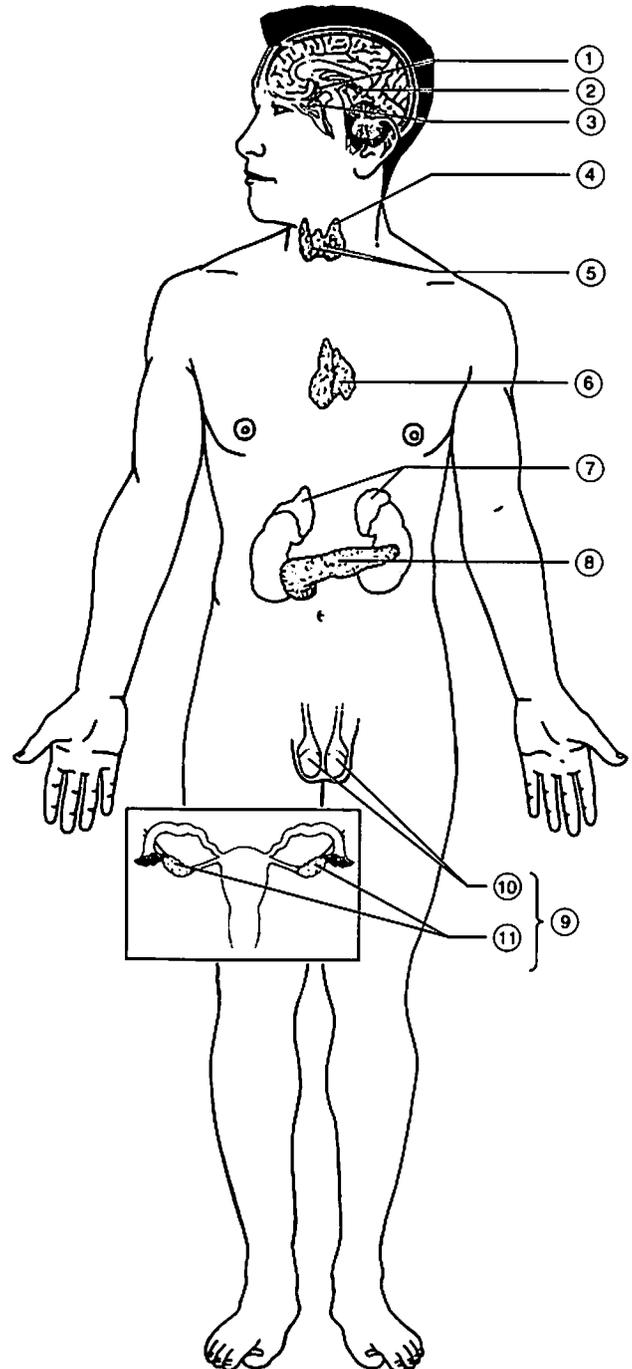
- | | |
|------------------------|-----------------------|
| A. catecholamines | H. T_3 and T_4 |
| B. steroids | I. calcitonin |
| C. insulin | J. ACTH |
| D. glucagon | K. releasing hormones |
| E. parathyroid hormone | L. prolactin |
| F. growth hormone | M. ADH |
| G. gonadotropins | N. oxytocin |

1. _____ Also called *somatotropic hormone*, this anterior pituitary hormone stimulates the growth of the musculoskeletal system.
2. _____ The only hormone that lowers blood glucose
3. _____ Cortisol, aldosterone, and testosterone
4. _____ Epinephrine and norepinephrine; sympathomimetic hormones

5. _____ Pancreatic hormone that increases blood glucose levels
6. _____ Hormone that acts on three target organs (bones, kidneys, and intestine) to increase the blood levels of calcium
7. _____ A tropic hormone that is suppressed by increasing plasma levels of cortisol
8. _____ TSH stimulates the thyroid gland to release these hormones.
9. _____ Include follicle-stimulating hormone (FSH) and luteinizing hormone (LH)
10. _____ Stimulates the breasts to make milk; also called *lactogenic hormone*
11. _____ Posterior pituitary hormone that enhances labor
12. _____ Parafollicular cells, thyroid gland, stimulates osteoblastic activity
13. _____ Iodine-containing hormones that regulate basal metabolic rate (BMR)
14. _____ Posterior pituitary hormone that stimulates the kidneys to reabsorb water
15. _____ Hypothalamic hormones that control the hormonal secretion of the anterior pituitary gland
16. _____ Tropic hormone that stimulates the adrenal cortex to secrete cortisol
17. _____ The stimulus for its release is an increasing blood glucose level.
18. _____ Posterior pituitary hormone that is secreted in response to a low blood volume and concentrated blood, as occurs in dehydration
19. _____ Stimulates osteoclastic activity
20. _____ Posterior pituitary hormone that is involved in the release of milk from the breast (the milk let-down reflex)
21. _____ Also called *vasopressin*
22. _____ A decrease in plasma calcium is the stimulus for its release

READ THE DIAGRAM

Directions: Referring to the diagram, fill in the spaces with the correct numbers. Some numbers may be used more than once. See text, pp. 263-277.



1. _____ Gland that contains the alpha and beta cells of the islets of Langerhans
2. _____ Gonads that secrete estrogen and progesterone
3. _____ A deficiency of this gland causes diabetes insipidus.

4. _____ Secretes T_3 and T_4 and calcitonin
5. _____ Secretes releasing hormones
6. _____ Secretes ADH and oxytocin
7. _____ A deficiency of this gland causes cretinism and myxedema.
8. _____ A deficiency of this gland causes hypocalcemic tetany.
9. _____ Called the *hypophysis*
10. _____ The hypothalamus and this gland compose the hypothalamic-hypophyseal portal system.
11. _____ Secretes tropic hormones such as ACTH, TSH, growth hormone, and gonadotropins
12. _____ Secretes the catecholamines, epinephrine, and norepinephrine
13. _____ Secretes the steroids—glucocorticoids, mineralocorticoids, and androgens
14. _____ Target gland for ACTH
15. _____ Target gland for TSH
16. _____ Secretes insulin and glucagon
17. _____ Target gland (female) for FSH and LH
18. _____ Target gland (male) for gonadotropins
19. _____ A low plasma level of calcium stimulates these glands to secrete PTH.
20. _____ A high plasma level of calcium stimulates this gland to secrete calcitonin.
21. _____ Secretion of this gland contributes to the fight-or-flight response.
22. _____ Gland that secretes cortisol, aldosterone, and testosterone
23. _____ Hypersecretion of this gland causes Cushing's syndrome.
24. _____ Hypersecretion of this gland causes Graves' disease.
25. _____ Hypersecretion of this gland is associated with exophthalmos.
26. _____ Gonad that secretes testosterone
27. _____ Gland that uses iodine to synthesize its hormones
28. _____ Gland that plays an important role in immunity and involutes, or shrinks, after puberty
29. _____ Secretes hormones concerned with sugar, salt, and sex
30. _____ A cone-shaped gland located in the brain; called the *biological clock*
31. _____ Gland that secretes the hormone that lowers blood glucose level
32. _____ Gland that secretes FSH and LH
33. _____ Hormone that secretes lactogenic hormone
34. _____ Gland that is the target gland for the releasing hormones
35. _____ Gland that can develop a goiter
36. _____ Gland that controls BMR
37. _____ This gland secretes a hormone that promotes labor.
38. _____ Hypersecretion of this gland can cause gigantism (childhood) or acromegaly (adult).
39. _____ Hyposecretion of this gland causes Addison's disease.
40. _____ Gland that secretes both steroids and catecholamines
41. _____ Refers to the male and female gonads

COLORING

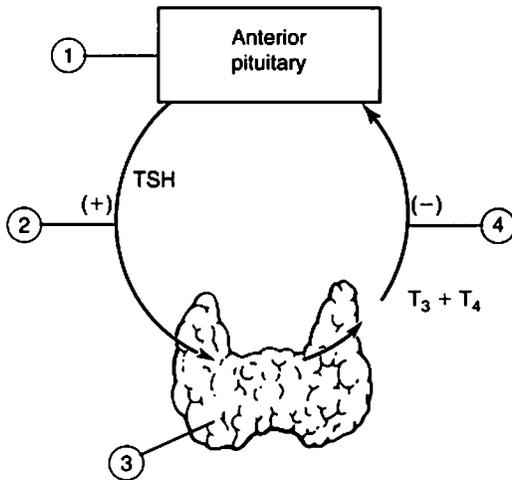
Directions: Color the appropriate areas on the illustration on the previous page as indicated below.

1. Color the pituitary gland *red*.
2. Color the gland that secretes insulin and glucagon *blue*.

3. Color the gland that secretes T_3 and T_4 *yellow*.
4. Color the target gland of FSH and LH *purple*.
5. Color the suprarenal glands *pink*.
6. Color the parathyroid glands *black*.
7. Color the thymus gland *orange*.

READ THE DIAGRAM

Directions: Referring to the diagram, fill in the spaces with the correct numbers. Some numbers may be used more than once. See text, pp. 267-269.

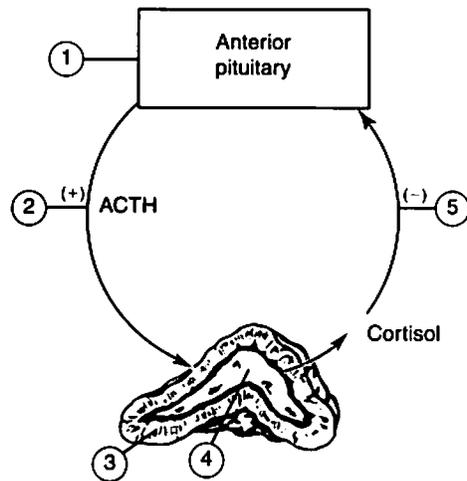


1. _____ T_3 and T_4 are secreted by the thyroid gland.
2. _____ Hormone that is secreted by the adenohypophysis and stimulates the thyroid gland
3. _____ The adenohypophysis
4. _____ The thyroid gland
5. _____ Represents hormonal negative feedback
6. _____ The gland that is stimulated by the hypothalamic releasing hormone
7. _____ The target gland of TSH
8. _____ The gland that contains hormone-secreting follicles filled with colloid
9. _____ The gland that receives blood from the hypothalamic-hypophyseal portal blood vessels
10. _____ The gland that secretes iodine-containing hormones

11. _____ The gland that secretes hormones that regulate metabolism
12. _____ The gland that develops a goiter in response to iodine deficiency
13. _____ This gland secretes triiodothyronine and tetraiodothyronine.
14. _____ The gland that sits in the sella turcica of the sphenoid bone and behind the optic chiasm
15. _____ The gland that is anterior to the trachea, a respiratory structure
16. _____ The gland that can easily be palpated on physical examination
17. _____ Administration of Synthroid, a thyroxine drug, causes a decrease in the secretion of TSH from this gland.
18. _____ Two lobes of this gland are connected by an isthmus.

READ THE DIAGRAM

Directions: Referring to the diagram, fill in the spaces with the correct numbers. Some numbers may be used more than once. See text, pp. 271-273.

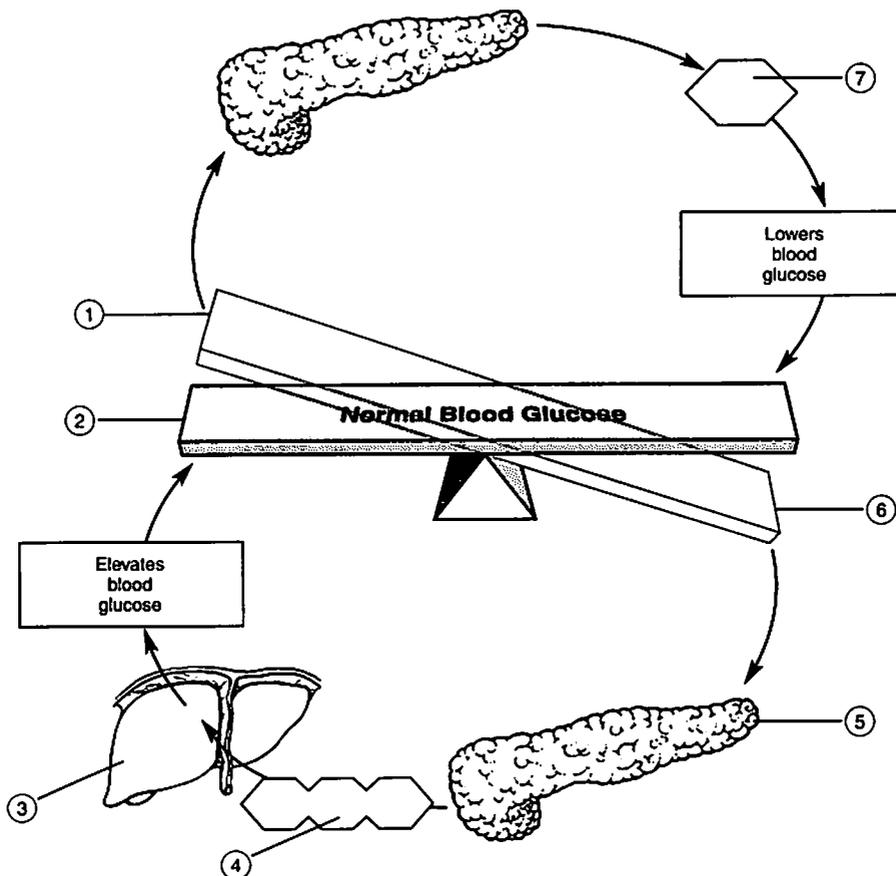


1. _____ The gland that secretes cortisol
2. _____ The adrenal medulla
3. _____ The adrenal cortex
4. _____ The adenohypophysis
5. _____ The gland that secretes hormones that control sugar, salt, and sex
6. _____ The gland that secretes ACTH

7. _____ Secretion of this gland resembles the effects of sympathetic nerve stimulation.
8. _____ The target organ of ACTH
9. _____ The gland that is the target organ of the hypothalamic releasing hormone
10. _____ The gland that is suppressed by cortisol in a negative feedback fashion
11. _____ The gland that secretes catecholamines
12. _____ The adrenal cortical hormone that suppresses the adenohipophyseal secretion of ACTH
13. _____ The gland that secretes steroids
14. _____ The gland that secretes glucocorticoids, mineralocorticoids, and androgens
15. _____ This gland secretes epinephrine and norepinephrine.
16. _____ Hypersecretion of this gland causes Cushing's syndrome.
17. _____ The administration of prednisone, a steroid similar to a natural glucocorticoid, suppresses the secretion of ACTH from this gland.
18. _____ Hypersecretion of this gland causes pheochromocytoma.

READ THE DIAGRAM

Directions: Referring to the diagram, fill in the spaces with the correct numbers. Some numbers may be used more than once. See text, pp. 274-276.



1. _____ The signal that causes the secretion of glucagon
2. _____ The signal that diminishes the secretion of glucagon
3. _____ The signal that causes the secretion of insulin
4. _____ The signal that diminishes the secretion of insulin

5. _____ The part of the board that indicates a declining blood glucose
6. _____ The hormone secreted by the pancreas in response to a decreased blood glucose
7. _____ The part of the board that indicates a rising blood glucose
8. _____ The part of the board that indicates blood glucose about a half-hour after a meal
9. _____ The organ in which glucagon stimulates glycogenolysis, thereby increasing blood glucose
10. _____ The hormone secreted by the pancreas in response to an elevated blood glucose
6. _____ The adult form of hypothyroidism that is treated with thyroid hormone
7. _____ Antithyroid drugs and surgery are used to treat this form of hyperthyroidism.
8. _____ An infant born with a deficiency of thyroid hormones develops this condition, characterized by a severe delay in both physical and mental development.
9. _____ A deficiency of parathyroid hormone causes this life-threatening hypocalcemic condition.
10. _____ Condition that is caused by hypersecretion of growth hormone in an adult (after the fusion of the epiphyseal discs)
11. _____ Condition that is caused by a hypersecretion of somatotrophic hormone in a child
12. _____ Condition that is caused by hyposecretion of somatotrophic hormone in a child
13. _____ Condition that results from a tumor of the adrenal medulla, which causes a very high (and dangerous) blood pressure
14. _____ Describes the bulging or protruding eyes that characterize hyperthyroidism
15. _____ A person who takes high doses of steroids over an extended time will develop this group of signs and symptoms.
16. _____ If untreated, this deficiency disease will progress to adrenal shock.
17. _____ If untreated, this condition progresses to ketoacidosis.
18. _____ Characterized by sustained muscle contraction and an inability to ventilate (breathe)
19. _____ Requires replacement doses of steroids, especially mineralocorticoid
20. _____ Requires replacement doses of T_3 and T_4

MATCHING

Endocrine Disorders

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 263-277.

- | | |
|-----------------------|---------------------|
| A. diabetes mellitus | H. pheochromocytoma |
| B. Addison's disease | I. myxedema |
| C. Cushing's syndrome | J. tetany |
| D. goiter | K. acromegaly |
| E. exophthalmos | L. gigantism |
| F. Graves' disease | M. dwarfism |
| G. diabetes insipidus | N. cretinism |

1. _____ This results from an iodine-deficient diet, which causes a hyperplasia or overgrowth of the thyroid gland.
2. _____ Results from a deficiency of insulin; the person becomes hyperglycemic and glucosuric.
3. _____ Condition that is caused by a deficiency of adrenocortical steroids
4. _____ Results from a deficiency of ADH that causes the person to urinate up to 25 L/day of pale urine
5. _____ Condition that is treated with replacement doses of insulin

TELL A STORY**Ms. Chvostek's Face Is A-Twitching**

Directions: Use these words to complete the story. See text, pp. 269-271.

(+) Chvostek's sign	(+) Trousseau's sign
PTH	laryngospasm
kidneys	carpal spasm
tetany	parathyroid
osteoclastic activity	intestine

Plasma levels of Ca^{2+} are regulated very closely. As the plasma Ca^{2+} level decreases, the hormone _____ is secreted by the _____ glands. This hormone stimulates the _____ to reabsorb Ca^{2+} from the urine and the _____ to increase the absorption of dietary Ca^{2+} . Most important, the hormone stimulates _____; this action causes the Ca^{2+} to leave the bone and enter the plasma, thereby elevating the plasma Ca^{2+} level. So why is Ms. Chvostek's face a-twitching? Ms. Chvostek had her parathyroid glands surgically removed by accident (during a thyroidectomy). She subsequently developed hypocalcemia; this condition is manifested clinically as _____ (a sustained muscle contraction). Two "muscle" signs of hypocalcemic tetany are _____ and _____. The Ca^{2+} imbalance also increases the nerve irritability, manifested clinically as _____ and _____.

SIMILARS AND DISSIMILARS

Directions: Circle the word in each group that is least similar to the others. Indicate the similarity of the three words on the line below each question.

1. beta cells islets of Langerhans aldosterone alpha cells

2. myxedema Graves' disease Cushing's syndrome toxic goiter

3. polyuria polycythemia polydipsia polyphagia

4. mineralocorticoid androgen
glucocorticoid epinephrine

5. cortisol aldosterone glucagon testosterone

6. ACTH prolactin growth hormone ADH

7. ADH oxytocin epinephrine vasopressin

8. PTH T_3 TSH thyroxine

9. adenohipophysis pancreas
pituitary gland neurohypophysis

10. FSH gonadotropins insulin LH

11. glucagon adrenal cortex pancreas insulin

12. steroids catecholamines
epinephrine norepinephrine

13. T_4 insulin triiodothyronine thyroxine

14. prolactin pancreas milk lactogenic hormone

15. PTH calcium salt retention osteoclastic activity

16. diabetes insipidus glucagon ADH polyuria

17. insulin pancreas ADH hyperglycemia
deficiency

18. gigantism acromegaly goiter iodine

19. (+) Chvostek's sign hypocalcemic tetany cretinism carpal spasm

20. estrogen testosterone ACTH progesterone

21. moon face Addison's disease Cushing's syndrome buffalo hump

22. diabetes mellitus supraclavicular fat pad insulin deficiency glucosuria

23. cortisol glucocorticoid Cushing's syndrome carpal spasm

24. T₃ thyroxine ADH calcitonin

25. ADH kidney water balance adenohipophysis

Part II: Putting It All Together

MULTIPLE CHOICE

Directions: Choose the correct answer.

- Which of the following is least true of or related to an endocrine gland?
 - It secretes hormones.
 - They are ductless glands.
 - Secretions are transported by the blood.
 - All hormones are steroids.
- The adenohipophysis
 - secretes only steroids.
 - is controlled by the hypothalamus.
 - is controlled by the posterior pituitary gland.
 - requires iodine for the synthesis of TSH.
- Complete this series: CRH → ACTH →
 - T₃ and T₄
 - cortisol
 - insulin
 - ADH
- Complete this series: TRH → TSH →
 - T₃ and T₄
 - cortisol
 - insulin
 - ADH
- Which of the following is true of insulin?
 - secreted by the posterior pituitary gland
 - deficiency causes diabetes insipidus
 - secreted in response to decreased blood glucose
 - helps regulate blood glucose
- Which of the following is not true of glucagon?
 - lowers blood glucose level
 - synthesized by the pancreas
 - synthesized by the islets of Langerhans
 - opposes the action of insulin
- Which of the following statements is true about ACTH? It
 - is a releasing hormone.
 - is secreted by the hypothalamus.
 - stimulates the adrenal cortex to secrete cortisol.
 - is released in response to elevated cortisol levels in the blood.
- Which of the following is most related to FSH and LH? They
 - are secreted by the pancreas.
 - are neurohypophyseal hormones.
 - regulate the blood glucose level.
 - are tropic hormones aimed at the ovaries and testes.
- The ketoacidosis of diabetes mellitus is
 - caused by hyperglycemia.
 - a consequence of glucosuria.
 - caused by the rapid and incomplete breakdown of fatty acids.
 - caused by an insulin-induced gluconeogenesis.
- Hyperglycemia, glucosuria, and ketoacidosis are caused by
 - excess secretion of ACTH by the anterior pituitary gland.
 - a deficiency of ADH.
 - a deficiency of insulin.
 - hypersecretion of catecholamines by the adrenal medulla.

11. What characteristic is shared by both insulin and glucagon? Both
 - a. are steroids.
 - b. raise the blood glucose level.
 - c. lower the blood glucose level.
 - d. are secreted by the pancreas.
12. ACTH, TSH, and prolactin
 - a. are secreted by the pancreas.
 - b. are releasing hormones.
 - c. stimulate the adrenal cortex to secrete cortisol.
 - d. are synthesized by the adenohypophysis.
13. Which of the following is most related to the adrenal cortex? It
 - a. is the target gland of ACTH.
 - b. regulates calcium homeostasis.
 - c. secretes PTH.
 - d. is embedded within the thyroid gland.
14. BMR, iodine, myxedema, and Graves' disease are all
 - a. concerned with T_3 and T_4 .
 - b. concerned with the regulation of the plasma calcium level.
 - c. characterized by hypoglycemia.
 - d. concerned with adenohypophyseal secretions.
15. Which statement is true about ADH?
 - a. It is secreted by the anterior pituitary gland.
 - b. It helps to regulate blood volume.
 - c. A deficiency causes hypervolemia (expanded blood volume).
 - d. A deficiency causes oliguria (a decrease in urine excretion).
16. A deficiency of aldosterone
 - a. causes a decrease in blood volume.
 - b. causes diabetes insipidus.
 - c. causes hyperglycemia, hypernatremia, and hyperkalemia.
 - d. is called *Cushing's syndrome*.
17. Aldosterone
 - a. stimulates the reabsorption of potassium by the kidney.
 - b. causes the excretion of sodium in the urine.
 - c. excretes water, causing an increase in the output of urine.
 - d. stimulates the reabsorption of sodium and water by the kidney.
18. PTH
 - a. stimulates osteoclastic activity.
 - b. lowers the plasma calcium level.
 - c. elevates the blood glucose level.
 - d. requires iodine for its synthesis.
19. Which of the following statements is true regarding the aging process and the endocrine system?
 - a. With aging, most glands decrease their hormonal secretion, resulting in severe clinical disorders such as diabetes mellitus and Addison's disease.
 - b. Pheochromocytoma is the result of the normal aging process.
 - c. Although most glands decrease their hormonal secretions, normal aging does not cause deficiency states.
 - d. Most older adults suffer from osteoporosis and tetany.

CASE STUDY

J.C., a 17-year-old high school senior, is a star football player and has just been awarded an athletic scholarship to college. About 8 months ago, he began using anabolic steroids to improve his athletic performance.

1. The steroids most resemble the secretions of which gland?
 - a. pancreas
 - b. adrenal medulla
 - c. posterior pituitary gland
 - d. adrenal cortex
2. What steroid-induced effect was J.C. expecting?
 - a. increased muscle mass (bulking up) and strength
 - b. decreased appetite
 - c. decreased red blood cell production
 - d. increased sex drive

Student Name _____

Part III: Challenge Yourself!**GROUPS AND PUZZLE**

1. Which group is incorrect?
 - a. hormones of the anterior pituitary gland: ACTH, prolactin, TSH, growth hormone, insulin
 - b. hormones of the posterior pituitary gland: ADH, oxytocin
 - c. steroids: cortisol, aldosterone, testosterone
 - d. secretions of the gonads: estrogen, progesterone, testosterone

2. Which group is incorrect?
 - a. hormones of the posterior pituitary gland: ADH, oxytocin
 - b. steroids: cortisol, aldosterone, testosterone, estrogen
 - c. secretions of the gonads: estrogen, progesterone, testosterone
 - d. hormones secreted by the thyroid gland: T₃, T₄, PTH

3. Which group is incorrect?
 - a. hormones of the anterior pituitary gland: ACTH, prolactin, TSH, growth hormone
 - b. steroids: cortisol, aldosterone, testosterone
 - c. secretions of the gonads: estrogen, progesterone, testosterone
 - d. hormones secreted by the thyroid gland: TSH, T₃, T₄

PUZZLE**Hint: 'Roid Rage**

Directions: Perform the following functions on the Sequence of Words that follows. When all the functions have been performed, you are left with a word or words related to the hint. Record your answer in the space provided.

Functions: Remove the following:

1. Three classifications of adrenal steroids
2. The salt-retaining mineralocorticoid

3. Two adrenal medullary catecholamines
4. A group of symptoms that are caused by excess secretion of the adrenal cortex
5. The condition caused by a chronic hypofunction of the adrenal cortex
6. The cation that is eliminated in the urine in response to aldosterone
7. The cation that is reabsorbed from the urine in response to aldosterone
8. The rounded face and supraclavicular fat pad caused by excess cortisol
9. Disorder caused by excess secretion of the adrenal medulla (catecholamines)
10. ACTH stimulates the adrenal cortical secretion of this hormone.

Sequence of Words

SODIUMMOONFACEMINERALOCO
RTICOIDCUSHINGSSYNDROME
PH
EOCHROMOCYTOMACORTISOLEPI
NEPHRINEDRUG-INDUCEDAGGRE
SSIONGLUCOCORTICOIDBUFFALO
HUMPNOREPINEPHRINEADDISON
SDISEASEALDOSTERONEANDROGE
NPOTASSIUM

Answer: _____