

## Continuing Education Questions

SPRING 2013

1. A focus on the endocrine glands and their secretions is the medical science of \_\_\_\_\_. An example of this is the pituitary release of TSH impacting on the thyroid gland to produce \_\_\_\_\_.
  - a. Digestion, T3
  - b. Endocrinology, T4
  - c. Metabolism, rT3
  - d. Reproduction, calcitonin
2. The HPT axis refers to the linkage between:
  - a. gland, hypothalamus, and pituitary
  - b. hypothalamus, pituitary, and target gland
  - c. pituitary, target gland and thalamus
  - d. target tissues, hormone receptors, and proteins produced
3. Hormones can be divided in to peptides and steroid types. This article talked about how the peptide hormones are bound to the cell receptor and utilize a MBST to start the cascade of reactions that will result in the designated hormone activity. In the case of TSH, a peptide, hormone, the MBST was a(n)\_\_\_\_.
  - a. adenylyl cyclase transducer
  - b. chromaffin cellular complex
  - c. G-protein complex
  - d. phosphatase cascade of activation
4. Most steroid hormones are carried by a binding protein to the site of action because they are insoluble in aqueous environments. In the case of cortisol, a steroid hormone, the binding protein for transport is
  - a. albumin
  - b. CBG
  - c. TBG
  - d. SHBG
5. Negative feedback was described in text and diagrams. If you had a patient with elevated cortisol levels and abnormally low ACTH levels, you would suspect that this patient had lost his
  - a. ability to produce TSH in response to hypothalamic stimulation
  - b. ability to inhibit the hypothalamus CRH production
  - c. diurnal variation biorhythm pattern between the pituitary and the gland
  - d. hypothalamic function to produce the necessary releasing hormone
6. When blood pressure decreases, the release of renin from the \_\_\_\_\_ initiates the \_\_\_\_\_ mechanism.
  - a. kidney, angiotensinogen-aldosterone
  - b. kidney, Embden-Myer glucose
  - c. liver, renin-angiotensin
  - d. lung, renin-cortisol
7. Cortisol from the adrenal gland plays a role in quelling inflammatory processes. However, when prednisone, a cortisol-derived medication, is given for anti-inflammatory purposes, the immunoassay for cortisol on that patient will:
  - a. be subject to DOC interferences
  - b. continue to give reliable results because the cortisol antibody is specific
  - c. demonstrate a result that is falsely elevated
  - d. lose its diurnal variation between AM and PM assays
8. Soldiers with Post-Traumatic Stress Disorder (PTSD) have a number of hormone changes associated with their condition. Recent evidence has been looking at the hormone changes of:
  - a. elevations of aldosterone and decreases in epinephrine
  - b. elevations of cortisol and decreases in DHEA
  - c. decreases in aldosterone and increases in opiates
  - d. decreases in cortisol and increases in epinephrine
9. Aldosterone Renin Ratios (ARRs) are useful in the determination of hyperaldosteronism or hypoaldosteronism. The criteria for hyperaldosteronism is that the ARR be:
  - a. ability to produce TSH in response to hypothalamic stimulation
  - b. ability to inhibit the hypothalamus CRH production
  - c. diurnal variation biorhythm pattern between the pituitary and the gland
  - d. hypothalamic function to produce the necessary releasing hormone

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- a. less than 25 with an aldosterone value that is above 30 ng/dL
  - b. less than 30 with an aldosterone value greater than 15 ng/dL
  - c. greater than 25 with an aldosterone value greater than 15 ng/dL
  - d. greater than 30 with an aldosterone value above 30 ng/dL
10. A physician detects the presence of Cushing's syndrome in a patient and needs to determine the cause. Once he can rule out exogenous reasons, he orders testing to detect which type of Cushing's syndrome his patient has. Which result here would indicate that the patient has an ACTH-dependent Cushing's syndrome?
- a. ACTH value <5 pg/mL with PM cortisol value >15ug/dL
  - b. ACTH value >5 pg/mL with AM cortisol value < 15 ug/dL
  - c. ACTH value >70 pg/mL with PM cortisol value > 15 ug/dL
  - d. ACTH value >70 pg/mL with AM cortisol value < 10 ug/dL
11. A patient has a history of fungal infections. He comes to his physician complaining of weakness and fatigue. His laboratory results show a decreased glucose, increased potassium, decreased total carbon dioxide, slightly increased BUN, and a decreased cortisol level. These results would lead you to suspect that the patient has:
- a. Addison's disease
  - b. Cushing's syndrome
  - c. Intermittant Adrenal Hyperplasia
  - d. Pheochromocytoma
12. Thyroid hormones T<sub>4</sub> and T<sub>3</sub> are secreted in response from pituitary stimulation by:
- a. CRH
  - b. TRH
  - c. TSH
  - d. Somatostatin
13. The thyroid synthesis of T<sub>4</sub> within the follicular cells is a multi-step process. The organification step is when:
- a. iodine combines with tyrosine residues to form MIT and DIT
  - b. iodide is trapped in follicular cell and oxidized to iodine for MIT and DIT
  - c. proteases digest drops of colloid and release T<sub>3</sub> and T<sub>4</sub> to circulation
  - d. there is enzymatic coupling of the MIT and DIT forms to produce intrathyroglobulin T<sub>3</sub>
14. Congenital hypothyroidism or cretinism, according to the American Academy of Pediatrics, necessitates that all newborns be screened via:
- a. blood test for hyperthyroidism using the genetic markers for Graves disease
  - b. blood spots collected for TSH/backup T<sub>4</sub> screening for hypothyroidism
  - c. heel sticks for T<sub>4</sub> and T<sub>3</sub> using immunoassays for blood
  - d. isometric radial circumferences of their thigh muscles prior to discharge
15. A female patient during her routine physical exam has blood drawn for a comprehensive metabolic panel (CMP) and thyroid panel due some medication she is on. Her laboratory findings are within acceptable ranges except her TSH level is decreased. A follow-up thyroid panel test shows only her TSH value is decreased and her T<sub>4</sub> is fine. The physician tells the patient that she has:
- a. primary hypothyroidism
  - b. primary hyperthyroidism
  - c. subclinical hyperthyroidism
  - d. secondary hypothyroidism
16. Sick Euthyroid Syndrome (SES) occurs when a patient has abnormal thyroid hormone levels without the presence of thyroid disease. Which set of results represents the findings on a SES patient?
- a. elevated TSH, with no increase in T<sub>3</sub> and T<sub>4</sub>, patient has diabetes
  - b. decreased T<sub>3</sub> levels with elevated reverse T<sub>3</sub>, patient is on amiodarone for cardiac arrhythmias
  - c. elevated TSH with decreased T<sub>4</sub>, patient who had a baby 4 months ago
  - d. decreased TSH with increased T<sub>4</sub>, patient who exhibits eye orbit prominence

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17. Laboratory testing for thyroid-related disease could draw on a number of potential thyroid tests. At present the detection of thyroid disorders initially depends on:
- a. TSH, T<sub>4</sub>, and THBR
  - b. free T<sub>3</sub> and free T<sub>4</sub> testing
  - c. TT<sub>4</sub> and reverse T<sub>3</sub>, followed by TSH
  - d. TSH with reflex testing of free T<sub>4</sub>

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4. What subjects would you like to see addressed in the future Focus articles?

## Answers

Circle correct answer.

- |             |             |
|-------------|-------------|
| 1. a b c d  | 12. a b c d |
| 2. a b c d  | 13. a b c d |
| 3. a b c d  | 14. a b c d |
| 4. a b c d  | 15. a b c d |
| 5. a b c d  | 16. a b c d |
| 6. a b c d  | 17. a b c d |
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*Lezlee Koch, MT(ASCP), Clinical Laboratory Manager, Outreach, Avera McKennan Regional Laboratory, Sioux Falls SD*



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*Kyle Riding, MLS(ASCP)<sup>CM</sup>, Medical Laboratory Scientist, Boston Children's Hospital, Boston, MA*

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