

Endocrine Questions

Name: _____ Date: _____

Any, all or none may be correct. Please circle the correct answers.

1. Therapeutic option(s) for permanently eliminating hyperthyroidism of Graves' disease are
 - a. Antithyroid drugs
 - b. Iodides (as sodium iodide)
 - c. Thyroidectomy
 - d. ¹³¹I
 - e. external beam radiation

2. In treatment of Graves' hyperthyroidism, ¹³¹I is known to result in the following conditions:
 - a. Thyroid cancer in adult patients
 - b. Onset or aggravation of Graves' eye disease
 - c. Hypothyroidism
 - d. Allergic reactions (to iodine)
 - e. Thyroiditis (with tenderness and pain)

3. Hyperthyroidism from a single toxic nodule
 - a. Can be permanently eliminated by antithyroid drugs
 - b. If treated with ¹³¹I, the patient is best made euthyroid first with antithyroid drugs
 - c. If treated by thyroidectomy, there should be no subsequent hypothyroidism
 - d. Can usually be cured by small doses of ¹³¹I (eg 3-5 mCi)

4. In calculating a dose of ¹³¹I for treatment of Graves' hyperthyroidism in the usual patient you

(choose one)
 - a. Would
 - b. Would not

Measure the effective half life in the thyroid gland because (give reason)

5. Patients who have thyroid cancer;
- a. Most have the papillary type
 - b. After thyroidectomy, many will be found to be in stage I, a low risk category, and have risk of about 1% of dying from the cancer.
 - c. Require ¹³¹I to prevent disability and death from recurrences in cervical lymph nodes
 - d. Require thyroxine in doses 2-4 times the usual maintenance dose

6. In patients with papillary thyroid carcinoma, residual levels of stimulated serum thyroglobulin exceeding 2 ng/mL

- a. Probably indicate residual thyroid cancer when the post treatment ¹³¹I scintiscan shows no thyroid tissue
- b. Are a clear indication for ¹³¹I treatment
- c. Indicate autoimmune thyroiditis
- d. Frequently reflect laboratory errors when the ¹³¹I scintiscan shows no thyroid tissue

7. Which of the following are commonly used radionuclides for imaging the intact thyroid?

- a. I-127
- b. I-123
- c. I-125
- d. I-124
- e. I-131
- f. Tc-99m

8. Which of the following may be used for background correction in determining the radioactive iodine uptake

- a. Posterior neck
- b. Leg muscle
- c. Shielded anterior neck
- d. Parotid gland

9. Each uCi of ^{131}I absorbed by a normal 20g thyroid delivers approximately how much radiation to the thyroid
- 0.5 cGy
 - 1.0 cGy
 - 5.0 cGy
 - 10.0 cGy
 - 100 cGy
10. Which of the following characteristics of ^{131}I make it a good therapeutic agent for treatment of hyperthyroidism and thyroid cancer?
- Half life 13.2 hours
 - β^+ emission
 - Excretion by gastric mucosa
 - High energy gamma emission
 - None of the above
11. Radioiodine uptake may be elevated in the following conditions
- Thyrotoxicosis factitia
 - Iodine deficiency
 - Diffuse toxic goiter
 - Toxic adenoma
 - Post-partum (autoimmune) thyroiditis
12. Which of the following radiopharmaceuticals is not used to image the adrenal cortex
- ^{131}I -6 β -Iodomethylnorcholesterol
 - ^{131}I -I9-Iodocholesterol
 - ^{75}Se -Selenomethylnorcholesterol
 - ^{75}Se -Selenomethionine

13. Adrenocortical imaging with NP-59 is useful in all but the following

- a. Distinguishing cushing adenoma from ACTH-independent adrenocortical hyperplasia
- b. Distinguishing intra-adrenal pheochromocytoma from recurrent or metastatic pheochromocytoma
- c. Distinguishing adrenal adenoma from adrenocortical hyperplasia in primary aldosteronism
- d. Distinguishing benign from malignant incidentally discovered adrenal masses

14. The uptake of MIBG by adrenergic tissues is inhibited by all but one of the following medications

- a. Labetalol
- b. Ephedrine
- c. Phenoxybenzamine
- d. Cocaine

15. ¹²³Iodine is the preferred label for MIBG over ¹³¹iodine for the following reasons except

- a. a higher dose of ¹²³I-MIBG can be given with less imparted radiation/mCi to the body and thyroid gland
- b. higher quality SPECT can be performed
- c. delayed imaging (>48hrs) can be performed
- d. dosimetry is more favorable

16. Octreoscan (pentetreotide) and MIBG can be used to image neoplasms of neural crest origin, but exhibit sensitivities less than 60% in all but the following tumor types

- a. Metastatic gastrinomas
- b. Medullary carcinoma of the thyroid
- c. Carcinoid
- d. Pheochromocytoma

17. In a patient with recurrent or persistent hyperparathyroidism after initial unsuccessful exploration, the recommended approaches include:

- a. Reoperation by very experienced parathyroid surgeon
- b. Extensive neck and chest venous PTH sampling
- c. MIBI imaging.
- d. Venous PTH sampling followed by MRI

18. Which of the following criteria are necessary prerequisites for initiating parathyroid imaging.

- a. Serum parathormone elevation.
- b. Normal serum albumin level.
- c. Hypercalcemia (high ionized serum calcium).
- d. Hyperphosphatemia.
- e. History of renal calculi

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Answer Key (do not distribute)

1. a, c, d
2. c, e [note: some papers suggest an association of ¹³¹I and GED, but ¹³¹I is not known to cause GED]
3. c [note: most people have found larger than usual doses are required]
4. b – You can use an average T_{1/2} and the thyroid weight. The measurement of effective half life is of little benefit. [note: The effective half-life of ¹³¹I in the hyperthyroid gland appears to be 5.5-6.0 days in most patients, and therefore, with few exceptions it adds nothing to the usual microcuries/gram factor. However, some reports indicate that if the 24 h uptake is less than the 6 h uptake, that the effective half-life will be unusually short]
5. a, b
6. a
7. b, f [note: The word “commonly” may be tricky. However, one would rarely, if ever, use I-131 or I-124 to image the intact thyroid gland, e.g. to evaluate nodule function. Possibly the question should read: “for imaging the thyroid to evaluate nodule function.”]
8. . b, c
9. c (CRC manual states 800 rad/mCi for 15% uptake) [note: 15% uptake of 1 mCi is 150 uCi. Thus, 800 rad or cGy for 150 uCi leads to 800/150 or 5.3 cGy per uCi. Also, 100 uCi/g imparts about 10,000 cGy and 1 uCi/g imparts 100 cGy; then 1 uCi/20 g equals 0.05 uCi/g or 5 cGy.]
10. e [note: The question asks for characteristics of I-131.]
11. b,c,d [note: In areas of the world where there is iodine deficiency, thyroid uptake values are relatively high. I changed answer e in this question to make it conform to “any answer may be correct” format]
12. d
13. b
14. c
15. c
16. d
17. a, b, c [note: Each approach has value. The question could be worded better, but I will let it stand for now.]
18. a [note: Thyroid nodules may obscure or give unusual focal concentrations of tracer.]
19. a, c [note: Added question.]