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. 131-I
    e. external beam radiation

2. In treatment of Graves' hyperthyroidism, 131-I 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 131-I, 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 131-I (eg 3-5 mCi)

4. In calculating a dose of 131-I 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 131-I 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 131-I scintiscan shows no thyroid tissue
    b. Are a clear indication for 131-I treatment
    c. Indicate autoimmune thyroiditis
    d. Frequently reflect laboratory errors when the 131-I 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

a. 0.5 cGy
b. 1.0 cGy
c. 5.0 cGy
d. 10.0 cGy
e. 100 cGy

10. Which of the following characteristics of I-131 make it a good therapeutic agent for treatment of hyperthyroidism and thyroid cancer?

a. Half life 13.2 hours
b. B+ emission
c. Excretion by gastric mucosa
d. High energy gamma emission
e. None of the above

11. Radioiodine uptake may be elevated in the following conditions

a. Thyrotoxicosis factitia
b. Iodine deficiency
c. Diffuse toxic goiter
d. Toxic adenoma
e. Post-partum (autoimmune) thyroiditis

12. Which of the following radiopharmaceuticals is not used to image the adrenal cortex

a. I-131-6ß-Iodomethlynorcholesterol
b. I-131-I9-Iodocholesterol
c. 75-Se-Selenomethylnorcholesterol
d. 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. 123-Iodine is the preferred label for MIBG over 131-iodine for the following reasons except

a. a higher dose of 123-I-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 131-I and GED, but 131-I 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 T1/2 and the thyroid weight. The measurement of effective half life is of little benefit. [note: The effective half-life of 131-I 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 cCy; 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.]