SELF-ASSESSMENT QUIZ

The Continuing Education Committee presents this quiz for self evaluation on Radiation Protection. These questions are not designed to test all your skills, and by no means claim to cover all aspects of Radiation Protection. The committee thanks all item writers.

Answers can be found on page 154. If you don't score 100%, please use the references listed. We encourage you to further your professional growth and development by reading up on the subject of Radiation Protection.

Radiation Protection Quiz

1. *The NRC requires that all sealed sources of radioactivity be checked for leakage and contamination every:*
   a. month
   b. three months
   c. six months
   d. year — Ref 6 part 35.13

2. *How often does the NRC require the survey meter be calibrated for accuracy?*
   a. monthly
   b. quarterly
   c. semi-annually
   d. annually — Ref 10 part 8.23

3. *A patient who received a therapeutic dose of Sodium Iodide I-131 shall not be released from the hospital if the exposure in R/year at one meter could exceed:*
   a. 0.5
   b. 1
   c. 1.25
   d. 5 — Ref 11 part 4.1

4. *Which of the following situations presents the largest hazard to the technologist from bremsstrahlung exposure?*
   a. P-32 dose stored in lead pig
   b. P-32 dose in unshielded syringe
   c. Tc-99m dose stored in lead
   d. Tl-201 dose in unshielded syringe
   Ref 8 p. 156–174

5. *Which of the following equals 1 Becquerel (Bq)?*
   a. 1 dps
   b. 0.010 rads
   c. 3.7×10^3 dps
   d. 1 curie — Ref 5 p. 3–36

6. *Upon arrival, a package containing radioactive material with a DOT Category II Yellow label must have a dose rate which does NOT exceed:*
   a. 5 mrem/hr at the surface
   b. 50 mrem/hr at the surface
   c. 2 mrem/hr at 3 feet
   d. 200 mrem/hr at 3 feet — Ref 9 p. 155–161

7. *If a nuclear medicine technologist receives 10 mrads of gamma radiation, what is the dose equivalence in rems?*
   a. 0.001
   b. 0.01
   c. 0.1
   d. 10 — Ref 3 p. 55–65

8. *The three most important factors to be considered when handling radioactive materials are:*
   a. Activity, distance, type of emission
   b. Type of emission, shielding, area of exposure
   c. Organ sensitivity, type of emission, distance
   d. Time, distance, shielding — Ref 8 p. 161

9. *Which of the following equals 1 Sievert (Sv)?*
   a. 1 rem
   b. 10 rads
   c. 100 rads
   d. 100 rems — Ref 3 p. 55–65

10. *What is the NRC requirement for the maximum concentration of Xe-133 gas in the air of a restricted area?*
    a. 5 pCi/ml
    b. 10 pCi/ml
    c. 1 μCi/ml
    d. 5 μCi/ml — Ref 3 p. 89–110

11. *The specific gamma ray constant for Tc-99m is 0.6 (R-cm²/mCi-hr). What dose in R/hr would be received from a 25 mCi point source of Tc-99m at a distance of 0.25?*
    a. 5.4
    b. 24
    c. 240
    d. 540 — Ref 7 p. 345–364

12. *The use of I-123 rather than an equal amount of I-131 reduces the radiation exposure to the thyroid by a factor of approximately:*
    a. 3
    b. 10
    c. 30
    d. 100 — Ref 2 p. 244

13. *Which unit describes the absorbed dose?*
    a. Roentgen
    b. rem
    c. rad
    d. Sievert — Ref 2 p. 183

14. *What is the maximum radiation dose in rems which could have been received by a 25-year-old radiation worker?*
    a. 25
    b. 35
    c. 45
    d. 125 — Ref 2 p. 177

15. *The ALARA concept in radiation protection refers to:*
    a. As long as radiation around.
    b. Personnel can accumulate maximum amount but no more.
    c. Personnel should be notified by the Radiation Safety Officer if radiation exposure exceeds MPD.
    d. Keeping personnel exposure to radiation as low as reasonably achievable. — Ref 2 p. 178

16. *If the point source exposure at 1 meter is 0.4 R/hr, what is the resultant exposure in R/hr if the distance is halved?*
    a. 0.2
    b. 0.63
    c. 0.8
    d. 1.6 — Ref 4 p. 109–111

17. *If a Geiger-Mueller survey meter is saturated by high levels of radiation, the meter needle will:*
    a. Fluctuate near the maximum
    b. Read zero to mid-scale
    c. Shoot off scale at the high end
    d. Vibrate at 60 cycles per second
    Ref 1 p. 108–109

18. *The absorber thickness required to reduce the exposure of gamma radiation by half is the:*
    a. inverse square law
    b. minimum room shielding required
    c. thickness of standard waste disposal units
    d. half-value layer — Ref 8 p. 160–161

19. *Urine and stool excreta from a patient who received therapeutic levels of I-131 in excess of 100 mCi:*
   a. Must be collected and stored until such time as the radioactivity reaches background level
   b. Must be collected and stored until such time as the radioactivity is less than 30 mCi
   c. May be released into the sanitary sewer as excreted
   d. Must be collected and transported to a burial site with other radioactive trash — Ref 2 p. 180

20. *All of the characteristics below describe a survey meter EXCEPT:*
   a. portable
   b. rugged construction
   c. sensitive to low levels
   d. good resolution — Ref 3 p. 33

21. *Which equals 1 Gray (Gy)?*
   a. 100 rads
   b. 100 rem
   c. 100 ergs
   d. 100 R — Ref 5 p. 5

22. *A film badge or TLD is required for any individual who may receive a radiation dose/quarter in excess of:*
   a. 5% of the MPD
   b. 25% of the MPD
   c. 50% of the MPD
   d. 75% of the MPD — Ref 6 part 20.202

23. *Upon arrival, a package containing radioactive materials from DOT Category III Yellow label must have a dose rate in mrem/hr at the surface must NOT exceed:*
   a. 20
   b. 100
   c. 200
   d. 400 — Ref 6 part 20.205

24. *A RADIATION AREA sign must be posted if the dose rate in the area exceeds:*
   1. 5 mrem/hr
   2. 10 mrem/hr to a major portion of the body
   3. 100 mrem/hr total over 5 consecutive days

   a. 1 only
   b. 2 only
   c. 1 and 3 only
   d. 2 and 3 only — Ref 6 part 20.202

25. *What is the MPD in rems for the hands/forearms of a radiation worker?*
   a. 1.25
   b. 5
   c. 18.75
   d. 75 — Ref 6 part 20

References

1. Shapiro, J: *Radiation Protection,* 2nd ed, Cambridge, Harvard University Press, 1981
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6. US Code of Federal Regulations, Title 10, Parts 19, 20, and 35.
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11. NCRP Report No. 37, 1970

TECHNOLOGIST SECTION PROGRAM

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The Scientific and Teaching Sessions Committee of the Technologist Section welcomes the submission of abstracts from nuclear medicine technologists for the 32nd Annual Meeting of the Society of Nuclear Medicine. Contributions accepted for the program will be presented at the meeting and published in the June issue of the *Journal of Nuclear Medicine Technology.* Original contributions on a variety of topics (as follows) will be considered:

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