Chapter 01: Introduction to Radiation Protection
Test Bank

MULTIPLE CHOICE

1. Some consequences of ionization in human cells include:
   1. creation of unstable atoms.
   2. production of free electrons.
   3. creation of reactive free radicals capable of producing substances poisonous to the cell.
   a. 1 only
   b. 2 only
   c. 3 only
   d. 1, 2, and 3

   ANS: D REF: 2

2. Which of the following is a special form of radiation that is capable of creating electrically charged particles by removing orbital electrons from the atom of the material with which it interacts?
   a. Ionizing radiation
   b. Nonionizing radiation
   c. Subatomic radiation
   d. Ultrasonic radiation

   ANS: A REF: 2

3. Patients who have an understanding of the medical benefits of an imaging procedure because they received factual information about the study before having the examination are more likely to:
   a. assume a small risk of biologic damage but not overcome any radiation phobia they may have.
   b. cancel their scheduled procedure because they are not willing to assume a small risk of biologic damage.
   c. overcome any radiation phobia but not assume a small risk of possible biologic damage.
   d. overcome any radiation phobia and be willing to assume a small risk of possible biologic damage.

   ANS: D REF: 8

4. The millisievert (mSv) is equal to:
   a. 1/10 of a sievert.
   b. 1/100 of a sievert.
   c. 1/1000 of a sievert.
   d. 1/10,000 of a sievert.

   ANS: C REF: 9

5. The advantages of the BERT method are:
   1. it does not imply radiation risk; it is simply a means for comparison.

2. it emphasizes that radiation is an innate part of our environment.
3. the answer given in terms of BERT is easy for the patient to comprehend.

a. 1 and 2 only
b. 1 and 3 only
c. 2 and 3 only
d. 1, 2, and 3

ANS: D REF: 9

6. If a patient asks a radiographer a question about the potential risk of radiation exposure associated with a specific x-ray procedure, the radiographer should:
   a. use his or her intelligence and knowledge to answer the question honestly and provide a suitable example that compares the amount of radiation received from the procedure in question with natural background radiation received over a given period of time.
   b. avoid the patient's question by changing the subject.
   c. tell the patient that it is unethical to discuss such concerns.
   d. refuse to answer the question and recommend that he or she speak with the referring physician.

   ANS: A REF: 9

7. Which of the following is the intention behind the ALARA concept?
   a. To keep radiation exposure and consequent dose at the highest possible level
   b. To keep radiation exposure and consequent dose at an average level
   c. To keep radiation exposure and consequent dose at the lowest possible level
   d. To avoid the use of ionizing radiation in radiologic practice

   ANS: C REF: 5

8. The basic principles of radiation protection include which of the following?
   1. Time
   2. Distance
   3. Shielding
   a. 1 only
   b. 2 only
   c. 3 only
   d. 1, 2, and 3

   ANS: D REF: 5

9. In a hospital setting, which of the following professionals is expressly charged by the hospital administration to be directly responsible for the execution, enforcement, and maintenance of the ALARA program?
   a. Assistant administrator of the facility
   b. Chief of staff
   c. Radiation Safety Officer
   d. Student radiologic technologist

   ANS: C REF: 8

10. Why is a question about the amount of radiation a patient will receive during a specific x-ray procedure difficult to answer?
    1. Because the received dose is measured in a number of different units
    2. Because scientific units for radiation dose are not comprehensible by the patient
    3. Because the patient should not receive any information about radiation dose
    a. 1 and 2 only
    b. 1 and 3 only
    c. 2 and 3 only
    d. 1, 2, and 3

    ANS: A REF: 9

11. X-rays are a form of which of the following kinds of radiation?
    a. Environmental
    b. Ionizing
    c. Internal
    d. Nonionizing

    ANS: B REF: 2

12. The radiographer must answer patient questions about the potential risk of radiation exposure:
    a. abruptly to discourage the patient from asking any other questions.
    b. evasively so as not to reveal any information about radiation risk.
    c. honestly and in understandable terms.
    d. with technical terms.

    ANS: C REF: 9

13. Radiation phobia can be greatly reduced by explaining the diagnostic radiation dose to the patient by using the:
    a. ALARA method.
    b. BERT method.
    c. ORP method.
    d. TRACE method.

    ANS: B REF: 10

14. Which of the following provides the basis for determining whether an imaging procedure or practice is justified?
    a. ALARA program
    b. BERT method
    c. Efficacy
    d. TRACE program

    ANS: C REF: 4

15. Which of the following is a method of explaining radiation to the public?
    a. ALARA
    b. BERT
    c. ORP
    d. Standardized dose reporting

ANS: B REF: 10

16. Some ways of providing education for non-radiologist physicians who perform fluoroscopic procedures can include:
1. creating increased awareness of radiation dose for specific procedures through discussion.
2. establishing goals for lowering radiation dose for patients, assisting personnel, and themselves.
3. radiographers helping physicians performing fluoroscopic procedures by informing them that they have reached a specific dose, thereby giving fluoroscopists the opportunity to decide to continue or stop a procedure.
a. 1 only
b. 2 only
c. 3 only
d. 1, 2, and 3

ANS: D REF: 11

17. Some ways of providing education for imaging department staff are:
1. providing in-service education on various radiation safety topics to accommodate individual needs of staff members.
2. handing out a facts-to-remember sheet at the end of an in-service program.
3. e-mailing the most important topics covered in a staff in-service program to imaging staff members to help reinforce and retain vital information.
a. 1 only
b. 2 only
c. 3 only
d. 1, 2, and 3

ANS: D REF: 11

18. The TRACE program creates:
a. an analysis of radiation dose.
b. greater awareness of radiation dose.
c. a system of radiation dose reporting.
d. a means for determining radiation dose in fluoroscopic procedures.

ANS: B REF: 11

19. Typically, people are more willing to accept a risk if they perceive that the potential benefit to be obtained is:
a. greater than the risk involved.
b. equal to the risk involved.
c. less than the risk involved.
d. typically, people are not willing to accept risk no matter how great the benefit may be.

ANS: A REF: 8

20. Which of the following statements below is true?
a. It appears that no safe dose level exists for radiation-induced malignant disease.
b. The ALARA method establishes a dose level for radiation-induced malignancy.
c. The BERT method establishes a dose level for radiation-induced malignancy.

d. The TRACE method establishes a dose level for radiation-induced malignancy.

ANS: A REF: 5

21. The ALARA principle provides a method for comparing the amount of radiation used in various health care facilities in a particular area for specific imaging procedures. This information may be helpful to many:
    a. accrediting bodies.
    b. advisory groups.
    c. radiation standards organizations.
    d. regulatory agencies.

    ANS: D REF: 5

22. The term as low as reasonable achievable (ALARA) is synonymous with the term:
    a. background equivalent radiation time (BERT).
    b. equivalent dose (EqD).
    c. diagnostic efficacy.
    d. optimization for radiation protection (ORP).

    ANS: D REF: 5

23. Diagnostic efficacy includes:
    1. imaging procedure or practice justified by the referring physician.
    2. minimal radiation exposure used.
    3. optimal image(s) produced.
    4. presence or absence of disease revealed.
    a. 1, 2, and 3 only
    b. 1, 2, and 4 only
    c. 2, 3, and 4 only
    d. 1, 2, 3, and 4

    ANS: D REF: 5

24. The TRACE program consists of:
    1. rewriting regulatory standards.
    2. formulating new policies and procedures to promote radiation safety and the implementation of patient and community awareness.
    3. technologic enhancements.
    a. 1 and 2 only
    b. 1 and 3 only
    c. 2 and 3 only
    d. 1, 2, and 3

    ANS: C REF: 10

25. Effective protective measures take into consideration:
    1. both human and environmental physical determinants.
    2. technical elements.
    3. procedural factors.
    a. 1 and 2 only
    b. 1 and 3 only

c. 2 and 3 only
d. 1, 2, and 3

ANS: D REF: 3