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## Chapter (test-translated) artifettion Printered ical-radiography-8e-sherer

## Sherer: Radiation Protection in Medical Radiography, 8th Edition

## **MULTIPLE CHOICE**

- 1. Consequences of ionization in human cells include
  - 1. creation of unstable atoms.
  - 2. production of free electrons.
  - 3. creation of highly reactive free radicals capable of producing substances poisonous to the cell.
  - 4. creation of new biologic molecules detrimental to the living cell.
  - 5. injury to the cell that may manifest itself as abnormal function or loss of function.
  - a. 1, 2, and 3 only
  - b. 2, 3, and 4 only
  - c. 3, 4, and 5 only
  - d. 1, 2, 3, 4, and 5

ANS: D

- 2. Which of the following is a form of radiation that is capable of creating electrically charged particles by removing orbital electrons from the atom of normal matter through which it passes?
  - a. Ionizing radiation
  - b. Nonionizing radiation
  - c. Subatomic radiation
  - d. Ultrasonic radiation

ANS: A

- 3. Regarding exposure to ionizing radiation, patients who are educated to understand the medical benefit of an imaging procedure are more likely to
  - a. assume a small chance of biologic damage but not suppress any radiation phobia they may have.
  - b. cancel their scheduled procedure because they are not willing to assume a small chance of biologic damage.
  - c. suppress any radiation phobia but not risk a small chance of possible biologic damage.
  - d. suppress any radiation phobia and be willing to assume a small chance of possible biologic damage.

ANS: D

- 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

- 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. it provides an answer that 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

- 6. If a patient asks a radiographer a question about how much radiation he or she will receive from a specific x-ray procedure, the radiographer can
  - a. respond by using an estimation based on the comparison of radiation received from the x-ray to natural background radiation received.
  - 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

- 7. Why should the selection of technical exposure factors for all medical imaging procedures always follow ALARA?
  - a. So that referring physicians ordering imaging procedures do not have to accept responsibility for patient radiation safety.
  - b. So that radiographers and radiologists do not have to accept responsibility for patient radiation safety.
  - c. Because radiation-induced cancer does not appear to have a dose level below which individuals would have no chance of developing this disease.
  - d. Because radiation-induced cancer does have a dose level at which individuals would have a chance of developing this disease.

ANS: C

- 8. The cardinal 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

- 9. In a hospital setting, which of the following professionals is expressly charged by the hospital administration with being 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

- 10. Why is a question concerning the amount of radiation a patient will receive during a specific x-ray procedure difficult to answer?
  - 1. Because the received dose is specified in a number of different units of measure
  - 2. Because the scientific units for radiation dose are normally not comprehensible by a 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

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

ANS: B

- 12. What unit is used to measure radiation exposure in the metric International System of Units?
  - a. Coulomb per kilogram
  - b. Milligray
  - c. Millisievert
  - d. Sievert

ANS: A

- 13. What organization was founded in 2007 that continues their pursuit to raise awareness of the need for dose reduction protocols by promoting pediatric-specified scan protocols to be used for both radiology and nonradiology users of CT?
  - a. U.S. Food and Drug Administration
  - b. Alliance for Radiation Safety in Pediatric Imaging.
  - c. American Registry of Radiologic Technologists
  - d. The Joint Commission

ANS: B

- 14. Which of the following provides the basis for determining whether an imaging procedure or practice is justified?
  - a. ALARA concept
  - b. BERT method
  - c. Diagnostic efficacy
  - d. NEXT program

ANS: C

15. Which of the following is a method of explaining radiation to the public?

- a. ALARA
- b. BERT
- c. ORP
- d. NEXT

ANS: B

- 16. Radiology departments or individual radiologic technologists can "pledge" to image gently. The pledge includes which of the following?
  - 1. Make the image gently message a priority in staff communications each year.
  - 2. Review the protocol recommendations and, when necessary, implement adjustments to practice processes.
  - 3. Communicate openly with parents.
  - a. 1 only
  - b. 2 only
  - c. 3 only
  - d. 1, 2, and 3

ANS: D

- 17. In a team approach to patient care, various participants
  - 1. assume responsibility for their areas of expertise.
  - 2. emphasize the importance of communication throughout the team
  - 3. rotate as the person in charge of the team
  - a. 1 and 2 only
  - b. 1 and 3 only
  - c. 2 and 3 only
  - d. 1, 2, and 3

ANS: A

- 18. Which of the following radiation quantities is intended to be the best overall measure of the biologic effects of ionizing radiation?
  - a. Exposure
  - b. Effective dose
  - c. Absorbed dose
  - d. There is no radiation quantity that is intended to be the best overall measure of the biologic effects of ionizing radiation.

ANS: B

- 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

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 principle establishes a dose level for radiation-induced malignancy.
- c. The BERT method establishes a dose level for radiation-induced malignancy.
- d. The NEXT program and reference values establish a dose level for radiation-induced malignancy.

ANS: A

- 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

- 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

- 23. Diagnostic efficacy includes
  - 1. determining if an imaging procedure is justified.
  - 2. obtaining images with minimal radiation exposure.
  - 3. adhering to radiation safety guidelines.
  - 4. revealing the presence or absence of disease in a patient.
  - 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

- 24. Which of the following are required by The Joint Commission for CT?
  - 1. Annual education of staff in dose reduction techniques
  - 2. Minimum qualifications for medical physicists
  - 3. Documentation of CT radiation doses
  - 4. Management of CT protocols to minimize radiation dose
  - a. 1 and 2 only
  - b. 1 and 3 only
  - c. 2 and 4 only
  - d. 1, 2, 3, and 4

ANS: D

- 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