

MULTIPLE CHOICE

1. The use of X-rays to create a medical image on patients is referred to as
 - a. electrocardiography.
 - b. radiography.
 - c. sonography.
 - d. magnetic resonance imaging.

ANS: B

Radiography is the making of records, known as radiographs, of internal structures of the body by passage of X-rays or gamma rays through the body to act on, historically, specially sensitized film or, most commonly, on a digital imaging plate or detector. In the diagnostic radiography department, images are created using X-rays that pass through the body.

REF: p. 3

2. Particular care must be taken when using radiation for medical imaging. This is the result of radiation's ability to create _____ in human tissue and possible biochemical changes.
 - a. ionizations
 - b. radio waves
 - c. sound waves
 - d. thermal changes

ANS: A

Some forms of electromagnetic energy, including X-rays, have the ability to ionize atoms in matter. These ionizations have the ability to disrupt the composition of matter and are capable of disrupting life processes. Special protection should be provided to prevent excessive exposure to ionizing radiation.

REF: p. 3

3. In the diagnosis of patient disease states, physicians can select from an array of medical diagnostic modalities. Some of these involve the use of ionizing energy to create a medical image. If a physician is concerned about the use of ionizing radiation, he or she may choose to order any of the following diagnostic modalities *except*
 - a. thermograms.
 - b. medical sonography.
 - c. radiography.
 - d. magnetic resonance imaging.

ANS: C

Radiography is the making of records, known as radiographs, of internal structures of the body by passage of X-rays or gamma rays through the body to act on, historically, specially sensitized film or, most commonly, on a digital imaging plate or detector. In the diagnostic radiography department, images are created using X-rays that pass through the body (Fig. 1.2). Proper radiation protection is essential.

REF: p. 3

4. The Greek physician Hippocrates is regarded as the father of Western medicine. All of the following choices represent his medical beliefs *except* the
 - a. use of high ethical standards of conduct.
 - b. important medical value of sorcery and witchcraft.
 - c. importance of closely monitoring a patient's condition and recovery.
 - d. value of diet and exercise and allowing nature to take its course in recovery.

ANS: B

The Hippocratic Corpus is writings that they emphasize rational and natural explanations for the treatment of disease and reject sorcery and magic. The Hippocratic Oath still governs the ethical conduct of physicians today.

REF: p. 5

5. Throughout the history of medicine, remarkable achievements have been recorded. These events have led to our current understanding of the human organism and disease. As this research continues, much of it will most likely focus on
 - a. proper sanitation and public health.
 - b. immunology and the development of vaccines.
 - c. germ theory and infection.
 - d. human genes and genetic engineering.

ANS: D

Although the Human Genome Project is finished, analyses of the data will continue for many years. The replacement of faulty genes through gene therapy offers promises of cures for a variety of hereditary diseases, and through genetic engineering, important pharmaceuticals continue to be developed. Medical research will continue to focus on the genetic code in all cells.

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6. Wilhelm C. Roentgen's discovery of "the X-ray" is regarded as one of medicine's most significant achievements. Although his discovery was accidental, his early research was so thorough that no significant findings have been added to his original theories. This in itself is a true tribute to the brilliance of Roentgen as a scientist. One of the most famous early images he created was an X-ray image of his
- colon.
 - laboratory assistant's foot.
 - wife's hand.
 - kidneys.

ANS: C

November 8, 1895, is believed by historians to be the day that Roentgen created the famous image of the hand of his wife. Through his investigative methods, Roentgen identified the properties of X-rays. His methods were so thorough that no significant additions have been made to his work.

REF: p. 6

7. A valuable X-ray procedure used to diagnose a myocardial infarction is
- mammography.
 - myelography.
 - arthrography.
 - coronary arteriography.

ANS: D

Coronary arteriography is an extremely valuable tool in diagnosing atherosclerosis, which can block the coronary arteries and cause a heart attack (myocardial infarction). By way of a special catheter with a balloon tip, effective treatment of atherosclerosis is possible. This treatment of a blocked blood vessel is termed *angioplasty*. Angioplasty is used to treat patients without having to use invasive open-heart surgery.

REF: p. 8

8. All of the following are true of the diagnostic procedure of mammography *except*
- it is very valuable for the detection of early breast cancers.
 - the procedures may be performed using a general radiographic machine.
 - radiographers need to be specially trained in order to perform mammography.
 - radiographers must be certified by the ARRT to qualify for the mammography examination.

ANS: B

Special breast imaging centers have been built to accommodate the demand for mammography procedures. Equipment and supplies, such as a specially designed X-ray tube and high-resolution digital imaging detectors, are used to create high-quality breast images. Mammography cannot be performed using general X-ray equipment.

REF: p. 8

9. To study the blood vessels of the brain, kidneys, liver, and other organs, contrast material is administered into these vessels by using
- catheters.
 - stents.
 - balloons.
 - None of the above

ANS: A

Angiography is the term for radiologic examination of the blood vessels after injection of a contrast medium. Most often, the contrast material is injected through a catheter, which can be directed to a variety of major arteries or veins for visualization of these structures.

REF: p. 7

10. Radiologic science continues to be one of the most exciting professions in medicine. An imaging modality that uses no ionizing radiation and the energy of radio waves and magnetic fields is
- nuclear imaging.
 - thermography.
 - CVIT.
 - MRI.

ANS: D

Magnetic resonance imaging (MRI) uses a strong magnetic field and radio waves along with a computer to generate sectional images of patient anatomy. MRI creates no ionizations at current energy levels and is regarded as a safe modality, particularly for pediatric and pregnant patients.

REF: p. 10

11. A physician who specializes in the interpretation of medical images is known as a
- radiographer.
 - radiologist.
 - radiologic technologist.
 - radiologist assistant.

ANS: B

Radiologic technologist (RT) is a general term applied to persons qualified to use X-rays (radiography) or radioactive substances (nuclear medicine) to produce images of the internal parts of the body for interpretation by a physician known as a radiologist.

REF: p. 6

12. A class of health care workers who specialize in carrying out treatments designed to improve a patient's health condition and quality of life and who likely possess a 2- or 4-year degree are known as
- technicians.
 - therapists.
 - technologists.
 - practitioners.

ANS: B

Therapists specialize in carrying out treatments designed to correct or improve the function of a particular body part or system. Therapists possess varied levels of educational experiences ranging from 2- to 4-year to graduate college degrees.

REF: p. 11

13. Board-certified radiologists can be a medical doctor (MD) or a doctor of osteopathy (DO). To become a board-certified radiologist following medical school, these physicians must complete a
- residency.
 - master's degree education.
 - baccalaureate degree.
 - doctoral (Ph.D) degree program.

ANS: A

After medical school, most MDs and DOs complete additional clinical experience, known as a residency, in an area of specialization. Residencies are usually 3 or 4 years and may include a wide variety of branches in medicine.

REF: p. 12

14. The health occupation that deals with the management of patient medical records and medical coding is
- dietetics.
 - biomedical engineering.
 - health information services.
 - medical records therapist.

ANS: C

Health information services involve careers that are responsible for the management of health information, such as that contained in the patient's health record. These careers do not involve direct patient contact but are essential to the efficient operation of any health care facility.

REF: p. 12

15. The distinction between a technologist and a technician can be confusing to the general public, when related to medical personnel. A key difference between the two involves education. A technologist typically
- is very attentive to details as prescribed by a superior.
 - has a higher level of education and deal with higher-level problems.
 - works under the supervision of another health care provider.
 - works in a supportive role at the direction of a technician.

ANS: B

Technologist is a general term that applies to an individual skilled in a practical art. This health care provider applies knowledge to practical and theoretic problems in the field. Technician is a term that applies to a person who performs procedures that require attention to technical detail. Technicians work under the direction of another health care provider. The terms technologist and technician are often used interchangeably, which can create problems in disciplines in which the terms are used to denote differing levels of education. In general, technologists are involved in higher-level problem-solving situations and have more extensive educational preparation than do technicians.

REF: p. 11

16. The medical imaging specialty of _____ uses radiopharmaceuticals and gamma radiation in the production of medical images for patient diagnosis.
- radiation oncology
 - MRI
 - sonography
 - nuclear medicine

ANS: D

The field of nuclear medicine involves procedures that use radioactive materials for diagnostic or therapeutic purposes. Nuclear medicine procedures usually involve the imaging of a patient's organs—such as the liver, heart, or brain—after the introduction of a radioactive material known as a radiopharmaceutical.

REF: p. 8

17. The current medical standard for measuring bone health, with a high degree of accuracy, is
- radiographs of the chest.
 - DEXA studies of the hip and lower spine.
 - sonography of the heel.
 - nuclear scans of the bones.

ANS: B

Bone densitometry (BD) is used to diagnose osteoporosis, a condition that is often recognized in menopausal women but can also occur in men. To detect osteoporosis accurately, dual-energy X-ray absorptiometry (DEXA or DXA) is used. DEXA BD is the current standard for measuring bone mineral density (BMD).

REF: p. 9

18. Many medical professions have developed “practice standards” to ensure optimum performance of their members. The radiography “practice standards” are developed and maintained by the
- American College of Radiology (ACR).
 - American Society of Radiologic Technologists (ASRT).
 - American Registry of Radiologic Technologists (ARRT).
 - Food and Drug Administration (FDA).

ANS: B

Clinical practice standards for radiography have been developed by the ASRT. These practice standards help define the role of the radiographer and establish criteria used to judge performance.

REF: p. 7

19. The education of radiographers involves the commitment and dedication of many people. All of the following may be directly involved with and responsible for your education as a radiographer *except* the
- program director.
 - clinical coordinator or clinical instructor.
 - medical equipment applications specialist.
 - didactic faculty member.

ANS: C

A clinical instructor teaches students primarily on a one-on-one basis in the clinical setting. A didactic faculty member teaches students typically through classroom lectures and laboratory activities. A clinical coordinator has teaching responsibilities along with administrative duties in overseeing clinical education, most often in programs using many clinical education centers. A program director has teaching responsibilities, as well as overall administrative responsibility for the entire educational program.

REF: p. 11

20. To become a qualified, registered radiologist assistant (RRA), you must
- complete a recognized RRA educational course of study.
 - successfully pass the national examination for nursing (NCLEX).
 - be certified in radiography by the ARRT.
 - successfully complete the radiologist assistant examination offered by the ARRT.
 - become a member of a local professional group of radiologists.
- 2, 4, and 5 only
 - 1, 3, 4, and 5 only
 - 1, 3, and 4 only
 - 1 and 4 only

ANS: C

In 2005, the ARRT began offering a post primary examination for RRAs. To qualify to take the examination, individuals must be ARRT certified in radiography, earn a bachelor’s degree, have at least 1 year of acceptable clinical experience in radiography, complete an ARRT-approved RRA education program, and meet the educational, ethics, and examination standards established by the ARRT.

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