Unit 44

Radiation Protection in Medical Radiography

by

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Sixth Edition

Prepared by: Carolyn J. Frigmanski, M.A., B.S.R.T. @ Founder, S.T.A.R.S.
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Some of our self-learning participants purchased the fifth edition of Unit 44: *Radiation Protection in Medical Radiography* BEFORE the sixth edition was made available to the general public and BEFORE they have submitted the answer sheet for certification evaluation. The content is identical in either edition with a few minor chapter changes as listed below. We continue to evaluate post test answer sheets regardless of the edition used since the educational content remains the same, but the answer location may be in a different chapter number.

The A.S.R.T. also increased the continuing education credits from 15 to 17!

There is no penalty or reduction in Category A ce credits since more than enough questions were prepared for ce credit determination by the A.S.R.T.

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| Fifth edition | Please put N/A for questions 9; 40; 41; 45; 70; 73; 79; 86; 89; & 91 on your post test answer sheet. |
| Sixth edition | Please answer all questions since this is the latest published textbook. |

I hope this does not create confusion. It allows other participants to submit a valid answer sheet who may have the fifth edition. The fifth edition will be eliminated in the future since both I and the A.S.R.T. want participants to use current editions even though the content has not be altered significantly. Thank you for your consideration.

Please note: “The American Society of Radiologic Technologists (ASRT) Practice Standards for Medical Imaging and Radiation Therapy, the author of this CE course, and others concerned with radiation protection standards support the position that all patients, whether they have the potential to reproduce or not, should be shielded.”
Dear GXMO,

This home study product was originally developed for radiographers who are registered with the American Registry of Radiologic Technologists (ARRT) and approved by the American Society of Radiologic Technologists (ASRT). Expiration dates were required.

In the spring of 2013, The Ohio Department of Health (ODH) approved it for license renewal for GXMOs. The O.D.H. does NOT require an expiration date on the product. You must complete it BEFORE your license expires to get your approved CE credit!

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The ODH website is: http://www.odh.ohio.gov/odhPrograms/rp/rlic/ristatus.aspx

Email is: BRadiation@odh.ohio.gov

Thank you very much.
Unit 44
Title: Radiation Protection in Medical Radiography by Mary Alice Statkiewicz Sherer, Paula J. Visconti, & E. Russell Ritenour

Please complete the answer sheet at the conclusion of this post test and return it to the S.T.A.R.S. office.

Chapter 1
1. ________ ________ produces positively and negatively charged particles when passing through matter.

2. The ________ assumes the risk from the exposure to ionizing radiation when specific imaging procedures for health screening purposes are performed.
   a. radiologist  b. technologist  c. patient  d. physician

3. Diagnostic efficacy is the degree to which the diagnostic study accurately reveals
   a. the presence or absence of disease  b. the organs to be studied  c. soft tissue shadows  d. bone density

4. As low as reasonably achievable (ALARA) is a radiation protection principle applicable for
   a. nursing staff  b. medical doctors  c. patients  d. radiologists & radiographers

5. Management should perform periodic ________ ________ to determine how radiation exposure in the workplace might be lowered.
   a. patient surveys  b. worker seminars  c. exposure audits  d. radiation surveys

6. Patients can be made to feel that they are active participants in their own health care by utilizing
   a. printed directions  b. effective communication  c. asking questions  d. following directions

7. The radiation workers' responsibilities for an effective radiation safety program include an awareness of rules governing the workplace and performing duties consistent with
   a. the job description  b. doctor's orders  c. ALARA  d. universal precautions

8. The background equivalent radiation time (BERT) emphasizes that radiation
   a. is an innate part of our environment  b. comes from radon gas  c. escapes from our microwaves  d. lingers in x-ray rooms

9. On the electromagnetic spectrum, only x-rays and ________ are classified as ionizing radiation.
   a. microwaves  b. infrared  c. high level ultraviolet  d. gamma
10. Ionizing radiation produces biologic damage while penetrating the body tissues primarily by ejecting ______ from the atoms composing tissue.

   a. protons       b. neutrons       c. electrons       d. neutrinos

11. Ionizing radiation originating from environmental sources is called

   a. terrestrial radiation   b. cosmic radiation   c. internal radiation   d. natural background radiation

12. The term used to describe an unstable nucleus that emits one or more forms of ionizing radiation to achieve greater stability is

   a. ion pair       b. radionuclide       c. electron shell       d. isotope

13. Nuclear fuel, atmospheric fallout from nuclear weapons and medical radiation are all classified as ______ radiation.

   a. terrestrial       b. cosmic       c. artificial       d. natural

Chapter 2

14. The amount of energy absorbed per unit mass is referred to as the ______ dose.

   a. effective       b. absorbed       c. equivalent       d. collateral

15. A diagnostic x-ray beam is produced when a stream of high-speed electrons bombards a positively charged target called the

   a. filament       b. cathode       c. glass window       d. anode

16. In diagnostic radiology, the energy of the electrons inside the x-ray tube is expressed in

   a. megavolts       b. volts       c. kilovolts       d. millivolts

17. The reduction in the number of primary photons in the x-ray beam through absorption and scatter is called

   a. ion reduction       b. attenuation       c. photon absorption       d. transmission reduction

18. A low energy photon interacting with an atom with no energy change and only a slight change in the direction of the photon is an example of

   a. Compton scattering       b. photoelectric absorption       c. pair production       d. coherent scattering

19. The interaction responsible for most of the scattered radiation produced during radiologic procedures is

   a. Compton scattering       b. photoelectric absorption       c. pair production       d. coherent scattering

20. The most important mode of interaction between x-ray photons and the atoms of the patient’s body for producing useful patient images is called

   a. Compton scattering       b. photoelectric absorption       c. pair production       d. coherent scattering

21. The less a given structure attenuates radiation, the greater the radiographic

   a. contrast       b. fog       c. density       d. mass
22. The interaction that results when the energy of the incident photon is at least 1.022 megaelectron volts is
   a. Compton scattering    b. photoelectric absorption    c. pair production    d. coherent scattering
23. In positron emission tomography (PET) scanning, the source of the positrons are atomic nuclei that are
   unstable because they contain too many
   a. neutrons    b. protons    c. neutrinos    d. electrons
24. The process in which a high-energy photon collides with the nucleus of an atom absorbing all of the photon’s
   energy is called
   a. photodisintegration    b. annihilation radiation    c. positron decay    d. photon instability

Chapter 3

25. The first reported American fatality from exposure to ionizing radiation was
   a. Herbert Crookes    b. Thomas Edison    c. Bertha Roentgen    d. Clarence Dally
26. As early as 1910, many radiologists and dentists developed a reddening of the skin as a result of occupational
   exposure called
   a. radiokeratitis    b. radiodermatitis    c. erythematosis    d. skin lesions
27. From 1900 to 1930, the unit in use for measuring radiation exposure was called the
   a. skin erythema dose    b. absorbed dose    c. effective dose    d. equivalent dose
28. In 1928 the Second International Congress of Radiology accepted the ________ as a unit of exposure.
   a. rad    b. roentgen    c. sievert    d. curie
29. Nausea, fatigue, and loss of hair are considered to be ________ effects of exposure to ionizing radiation.
   a. somatic    b. latent    c. acute    d. needless
30. The ________ dose is a radiation dose below which an individual has a negligible chance of sustaining
    specific biologic damage.
   a. threshold    b. safe    c. tolerance    d. occupational
31. The international system standardizing the interchange of units among all branches of science is called
   a. International Radiation Protection Units    b. International System of Units
   c. International Units of Science    d. International System of Weights & Measures
32. By the 1950’s the tolerance dose for radiation protection purposes was changed to
   a. maximum permissible dose (MPD)    b. maximum occupational dose (MOD)
   c. maximum exposure dose (MED)    d. maximum absorbed dose (MAD)
33. The term measuring the overall risk arising from whole body irradiation of biologic tissue is called
   a. absorbed dose    b. equivalent dose    c. whole dose    d. effective dose
34. The internationally accepted unit for the measurement of exposure to x-radiation and gamma radiation is
   a. sievert (Sv)  b. "radiation-equivalent man" (Rem)
   c. radiation absorbed dose (rad)  d. Roentgen (R)

35. _________ dose is the quantity that attempts to summarize the overall potential for biologic damage to a human due to exposure to ionizing radiation.
   a. Equivalent  b. Exposure  c. Effective  d. Absorbed

36. The _________ represents the quantity of electrical charge flowing past a point in a circuit in 1 second when an electrical current of 1 ampere is used.
   a. sievert  b. gray  c. coulomb  d. rad

37. The amount of energy per unit mass absorbed by the irradiated object is called the
   a. absorbed dose  b. equivalent dose (D)  c. exposure (X)  d. effective dose (EfD)

38. Rads can easily be converted into the equivalent number of grays by dividing the rads by
   a. 50  b. 2  c. 100  d. 1000

39. The term used to describe radiation exposure of a population or group from low doses of different sources of ionizing radiation
   a. equivalent dose  b. collective effective dose  c. effective dose  d. exposure rate

Chapter 4

40. When a protective lead apron is used, the dosimeter should be worn
   a. outside the apron at collar level  b. outside the apron at waist level
   c. under the apron at collar level  d. under the apron at waist level

41. The radiation-dosimetry film contained in the radiographic film packet is sensitive to doses ranging from as low as 0.1 mSv to as high as _______ millisieverts (mSv).
   a. 5  b. 50  c. 500  d. 5,000

42. The amount of radiation to which the dosimetry film was exposed is determined by locating the exposure value of a control film of a similar optical density on a
   a. densitometer  b. sensitometer  c. control curve  d. characteristic curve

43. The main advantage of the film badge is that the radiographic film itself constitutes a permanent _______ record of personnel exposure.
   a. written  b. legal  c. institutional  d. government

44. The most sensitive type of personnel dosimeter is called a
   a. film badge  b. optically stimulated luminescence (OSL)
   c. pocket ionization chamber  d. thermoluminescent
45. The device that serves as the primary radiation survey instrument for area monitoring in nuclear medicine facilities is the
   a. Geiger-Muller (GM) detector
   b. ionization chamber-type survey meter (cutie pie)
   c. proportional counter
   d. radioisotope control meter

Chapter 5

46. Cells are made of __________, the chemical building material for all living things.
   a. proteins
   b. protoplasm
   c. enzymes
   d. amino acids

47. All __________ compounds contain carbon.
   a. organic
   b. inorganic
   c. structural
   d. complex

48. Molecules produced when amino acids form into long, chainlike molecular complexes are called
   a. carbohydrates
   b. lipids
   c. proteins
   d. nucleic acids

49. The chemical link connecting each amino acid in the molecular complex that form proteins is called
   a. protein synthesis
   b. amino connectors
   c. protein ties
   d. peptide bonds

50. __________ proteins function as organic catalysts affecting the rate or speed of chemical reactions without being altered themselves.
   a. Structural
   b. Building
   c. Enzymatic
   d. Acidic

51. The term used in radiation therapy when there is an attempt to deliver enough radiation to kill cancerous cells while delivering a less than cell killing, repairable, equivalent dose to surrounding healthy tissue is called
   a. survival dose
   b. therapeutic ratio
   c. repairable ratio
   d. lethal target dose

52. The body’s primary defense mechanism against infections and disease once the skin has been penetrated is
   a. lymphocytes
   b. antibodies
   c. antigens
   d. white blood cells

53. The primary molecular energy source for the cell is
   a. glucose
   b. protein
   c. carbohydrate
   d. lipid

54. Lipids are organic __________ built from smaller chemical structures.
   a. chains
   b. macromolecules
   c. compounds
   d. helixes

55. The smaller structures that make up the large, complex nucleic acid macromolecules are called
   a. monosaccharides
   b. glycerin
   c. nucleotides
   d. carbohydrates

56. The deoxyribonucleic acid (DNA) macromolecule is composed of two long chains composed of
   a. purines
   b. adenine-guanines
   c. hydrogen-carbons
   d. sugar-phosphates
57. The molecule that leaves the cell nucleus, enters the cytoplasm and directs the protein building process is
   a. DNA  b. ribonucleic acid (RNA)  c. messenger RNA  d. transfer RNA

58. The total amount of DNA contained within the chromosomes of a human being is called the
   a. genetic coding  b. human genome  c. genetic mapping  d. human genetic code

59. Acids, bases and salts found in the body and in nature independent of living things are categorized as
   a. pyrimidines  b. organic compounds  c. nitrogenous bases  d. inorganic compounds

60. The process in which the cell must expend energy to pump substances into and out of itself is termed
   a. active transport  b. particle transport  c. osmosis  d. hydration

61. The cytoplasm contains large amounts of all the cell’s molecular components with the exception of
   a. mitochondria  b. endoplasmic reticulum  c. ribosomes  d. DNA

62. In both mitosis and meiosis, DNA replicates during the stage called
   a. anaphase  b. telophase  c. interphase  d. metaphase

63. Chromosome damage caused by radiation can be evaluated during
   a. anaphase  b. telophase  c. interphase  d. metaphase

64. Male and female reproductive cells (germ cells) each contain ____ chromosomes at the beginning of meiosis.
   a. 46  b. 23  c. 92  d. 92

Chapter 6

65. Ionizing radiation damages living systems by removing ________ from the molecular structures of cells.
   a. neutrons  b. electrons  c. protons  d. photons

66. The type of radiation interaction with biologic tissue causing damage primarily through an indirect action from the production of free radicals is called
   a. “high-linear transfer energy (LET)”  b. alpha particle absorption
   c. “low-linear transfer energy (LET)”  d. low-energy neutron absorption

67. Low-LET radiation generally causes sublethal damage to DNA and reversible cellular damage to
   a. structural proteins  b. therapeutic enzymes  c. repair enzymes  d. proteins

68. The term used to describe the relative capabilities of radiation with different LETs to produce a particular biologic reaction is known as
   a. wave-particle duality  b. relative biologic effectiveness (RBE)
   c. radiation weighting factor (WR)  d. oxygen enhancement ratio (OER)
69. The term used to identify a solitary atom or a combination of atoms that behave as an extremely reactive single entity as a result of a presence of an unpaired electron is called a
   a. free radical    b. alpha particle   c. beta particle    d. photon

70. The presence of _________ in biologic tissues makes the damaged produced by free radicals permanent.
   a. nitrogen       b. hydrogen       c. sodium        d. oxygen

71. Indirect action of ionizing radiation refers to the effects produced by reactive free radicals created by the
   a. recombination of hydrogen & hydroxyl ions    b. interaction of radiation with water
   c. interaction with DNA                        d. damaged enzyme molecules

72. The severing of one of the DNA sugar phosphate chain side rails is called a
   a. point mutation   b. covalent cross link   c. base change   d. cleaved chromosome

73. Irradiation that occurs early in interphase, before DNA synthesis takes place, may
   a. effect only one daughter cell    b. effect separate chromatids
   c. effect each daughter cell generated   d. have no effect

74. The target theory states that an irradiated cell will die after exposure only if _______ molecules are inactivated.
   a. carbohydrate    b. protein    c. DNA    d. enzyme

75. The term used to identify cell death without attempting division during interphase is
   a. instant death        b. reproductive death
   c. genetic death     d. apoptosis

76. Relatively small doses of radiation can cause _________ death after one or more cell divisions.
   a. reproductive    b. mitotic    c. programmed    d. instant

77. A classic method of displaying the sensitivity of a particular type of cell to radiation is called the
   a. cell sensitivity curve    b. sensitivity/survival curve
   c. survival logarithm    d. cell survival curve

78. The principle describing the radiosensitivity of cells as directly proportional to their reproductive activity and inversely proportional to their degree of differentiation is called
   a. Marshall Proportional Sensitivity Law
   b. Law of Bergonie & Tribondeau
   c. Law of Maturity and Specialization
   d. Cell Sensitivity Theory

79. Human beings who receive a whole-body dose in excess of ______ may die within 30 to 60 days.
   a. 500 rads    b. 50 Gy    c. 500 Gy    d. 50 rads

Chapter 7

80. The term used to describe the biologic effects of radiation soon after humans receive high doses of ionizing radiation is called _______ effects.
   a. late          b. delayed     c. early    d. chronic
81. The period when symptoms that affect the hematopoietic, gastrointestinal and cerebrovascular systems become visible is called the
   a. latent period    b. manifest illness stage    c. prodromal period    d. initial stage

82. Follow-up studies of the survivors of the atomic bombing of Hiroshima and Nagasaki who did not die of acute radiation syndrome (ARS) have demonstrated late deterministic and _________ effects of ionizing radiation.
   a. stochastic    b. nonstochastic    c. mutational    d. genetic

83. The _________ system is the most radiosensitive vital organ system in human beings.
   a. gastrointestinal    b. cerebrovascular    c. reproductive    d. hematopoietic

84. The _________ form of ARS results when there is an exposure of 50 Grays or more of ionizing radiation.
   a. gastrointestinal    b. cerebrovascular    c. reproductive    d. hematopoietic

85. With medical support, human beings have tolerated doses as high as _____ Grays (Gy).
   a. 6    b. 8.5    c. 20    d. 30

86. Lethal dose (LD) charted as _____/_____ is more accurate for human beings when medical treatment is given promptly and the patients are supported through initial symptoms.
   a. 50/30    b. 10/30    c. 50/60    d. 100/60

87. _________ cells have a better prospect for recovery in the repair and recovery of cells receiving a sublethal dose of ionizing radiation

88. Permanent sterility will most likely result from a radiation dose of ___ or ___ Grays to the reproductive organs of both sexes.
   a. 0.5/1    b. 1/2    c. 3/4    d. 5/6

89. The cell stage in which chromosome damage caused by radiation damage is called _____________.
   a. prophase    b. telophase    c. anaphase    d. metaphase

Chapter 8

90. Biological effects are observed only when the _________ level or dose is reached.
   a. threshold    b. nonthreshold    c. stochastic    d. nonstochastic

91. Stochastic somatic effects are also called ____________ effects.
   a. probabilistic    b. problematic    c. deterministic    d. early

92. Cancer and genetic disorders are examples of ________ effects that probably do not have a threshold.
   a. nonstochastic    b. early    c. acute    d. stochastic
93. An embryologic or birth defect is an example of a ________________ event.
   a. deterministic       b. stochastic       c. threshold       d. nonthreshold

94. A ______ risk predicts that a specific number of excess cancers will occur as a result of exposure.
   a. relative       b. statistical       c. probable       d. absolute

95. ____________ is the most important late stochastic effect caused by exposure to ionizing radiation.

96. Radium poisoning was experienced by a population of
   a. watch-dial painters       b. miners       c. children       d. bomb victims

97. Biologic effects of ionizing radiation on future generations are termed ____________ effects.
   a. futuristic       b. genetic       c. chronic       d. acute

98. The organisms used in ionizing radiation experiments to determine hereditary effects were
   a. cats & dogs       b. bees & spiders       c. pigs & chickens       d. mice & flies

Chapter 9

99. The federal agency that has the authority to control the possession, use and production of atomic energy in the interest of national security is called the
   a. Environmental Protection Agency (EPA)       c. Food and Drug Administration (FDA)
   b. Nuclear Regulatory Commission (NCR)       d. Occupational Safety & Health Admin. (OSHA)

100. The day-to-day supervision of a facility’s radiation safety program is a responsibility of
    a. OSHA       b. radiation safety committee (RSC)
    c. radiation safety committee (RSO)       d. FDA

101. The as low as reasonably achievable (ALARA) concept presents an extremely conservative model with respect to the relationship between ionizing radiation and
    a. potential risk       b. biologic effects       c. patient dose       d. occupational dose

102. The frequency of occurrence of high-dose deterministic effects is _______ _________ to the dose.
    a. directly proportional       b. inversely proportional       c. non-threshold       d. nonlinear

103. The possibility of inducing a radiogenic cancer or genetic defect after irradiation in the medical imaging industry is termed
    a. vulnerability       b. assumed probability       c. risk       d. cumulative effect

104. An annual occupational effective dose limit of _______ mSv has been established for the whole body.
    a. 10       b. 20       c. 30       d. 50
Chapter 10

105. X-ray tube housing construction must meet requirements to prevent excessive _________ radiation.
   a. secondary  b. remnant  c. leakage  d. scatter

106. The patient’s skin surface should be at least ___ cm below the collimator.
   a. 5  b. 10  c. 15  d. 20

107. In most states regulatory standards require accuracy of ____% of the SID with PBL.
   a. 1  b. 2  c. 3  d. 4

108. _______ filtration includes the glass envelope, insulating oil and the glass window.
   a. inherent  b. added  c. total  d. structural

109. The _______ filter can be used when performing chest radiographs.
   a. wedge  b. angular  c. added  d. trough

110. _______ rare-earth film-screen image receptor systems increases quantum mottle.
   a. Slower  b. Newer  c. Regular/Par  d. Faster

111. Patient dose increases whenever _______ grid ratios are utilized.
   a. lower  b. higher  c. focused  d. parallel

112. The term _______ indicates the rows and columns of numeric values in a digital image.
   a. bit  b. pixel  c. matrix  d. byte

113. Pixel size may be as small as ___ micrometers.
   a. 50  b. 100  c. 200  d. 300

114. The input phosphor is constructed of _______ crystals.
   a. amorphous silicon  b. cesium iodide  c. silver halide  d. rare-earth

115. A primary protective barrier of ___ mm lead equivalent is required for an image intensifier unit.
   a. 0.5  b. 1.0  c. 1.5  d. 2.0

116. The time to onset of permanent epilation from fluoroscopy is
   a. 1 week  b. 2 weeks  c. 3 weeks  d. 4 weeks

Chapter 11

117. Motion that occurs due to a patient’s lack of control is called
   a. voluntary motion  b. involuntary motion  c. a spasm  d. peristalsis
118. A ______ gonadal shield eliminates the radiographer’s need to palpate the patient’s anatomy.
   a. flat          b. shaped          c. clear          d. shadow

119. Radiographic contrast is ________ as kVp increases and mAs decreases.
   a. optimized    b. increased    c. magnified    d. reduced

120. A ______ ______ program includes monitoring and maintenance of all processing and image display equipment.
   a. radiation control  b. quality assurance  c. quality control  d. physics control

121. The estimated GSD for the U. S. population is about ____ millisieverts (mSv) or ____ millirem (mrem).
   a. 0.1/10    b. 0.20/20    c. 0.3/30    d. 0.4/40

122. The most common measurement of milliroentgens per milliampere-second is at a distance of ____ inches from the x-ray tube target.
   a. 40        b. 36        c. 30        d. 25

123. Dose reduction in mammography can be achieved by
   a. using lower atomic number targets  b. converting to digital equipment  c. limiting the number of projections  d. x-raying the breasts during menses

124. Dissemination of information on pediatric CT dose reduction among various specialties is provided by the
   a. Pediatric Campaign  b. Pediatric CT Program  c. Peds CT Program  d. Image Gently Campaign

125. Fetal dose calculations should be performed by
   a. a radiologist  b. a radiologic physicist  c. a biomedical engineer  d. a radiographer

Chapter 12

126. The National Council on Radiation Protection and Measurements (NCRP) permit diagnostic imaging personnel to receive and “an annual occupational effective dose (EfD)” of ____ millisieverts (mSv).
   a. 25        b. 50        c. 100        d. 500

127. The cumulative effective dose (CumEfD) for whole body for radiation workers is ____ mSv x your age.
   a. 10        b. 15        c. 20        d. 25

128. During a diagnostic examination the patient produces scattered radiation due to the ________ effect.
   a. classical  b. coherent  c. Compton  d. photoelectric

129. The inverse square law (ISL) expresses the relationship between distance and
   a. quality  b. intensity  c. time  d. exposure
130. The purpose of a _______ protective barrier is to prevent direct or unscattered radiation from reaching personnel or members of the general public on the other side of the barrier.
   a. safety  b. secondary  c. primary  d. universal

131. When the protection factors of distance and shielding have been applied, the radiographer will receive the least amount of scatter by standing at a ____ degree angle to the x-ray beam.
   a. 15  b. 45  c. 90  d. 180

132. When patient immobilization is necessary and mechanical restraining devices are not feasible, the recommended person who should be used while wearing appropriate protective apparel is
   a. an occupationally exposed coworker  b. the medical radiographer
   c. a non-occupationally exposed person  d. the radiologist

133. The weekly radiation use of a diagnostic x-ray unit is called its
   a. workload (W)  b. use factor  c. occupancy factor  d. productivity factor

Chapter 13

134. _______ have the same number of protons within the nucleus but have different numbers of neutrons.

135. The radioactive isotope used to deliver radiation therapy to cancer patients with metastasis to the bone is
   a. iodine-125  b. technetium-99m  c. fluorine-18  d. strontium-89

136. Most isotopes generated by _______ immediately get rid of their excess energy.
   a. electron capture  b. annihilation radiation  c. beta decay  d. metastable decay

137. The most important isotope in positron emission tomography (PET) scanning today is
   a. fluorine-18  b. Technetium-99m  c. iodine-123  d. iodine-131

138. The radioactive tracer that is very similar chemically to glucose and will be metabolized by cancerous cells to reveal their locations is
   a. fluorine-18  b. strontium-89  c. iodine-123  d. fluorodeoxyglucose (FDG)

139. After the explosion of a dirty bomb, the individual at the receiving facility who would be available or responsible to assess contamination levels is the
   a. administrator  b. chief of staff
c. radiologist  d. radiation safety officer (RSO)

140. During an emergency situation, individuals engaged in lifesaving activities have a dose limit of ____ millisieverts (mSv).
   a. 50  b. 100  c. 250  d. 500
Please complete the following information so that you can obtain a signed certificate from an official from S.T.A.R.S. when you receive a 75% or higher score. (Please Print)

Name ________________________________

Address ________________________________

City ___________________________ State _______ Zip Code ________________

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Answer Sheet for: Unit 44: Radiation Protection in Medical Radiography
by Mary Alice Statkiewicz Sherer, Paula J. Visconti & E. Russell Ritenour

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