Fluoroscopy Safety

1. Large doses of radiation are known to increase the incidence of _____.
    a. Heart disease
    b. Cancer
    c. Diabetes
    d. Stroke
2. Which federal agency regulates the safety of employees from radiation?
    a. FDA
    b. CMS
    c. OSHA
    d. Health and Human Services
3. Which of the following is a unit of dose used to describe the biological effects of radiation?
    a. Millicurie
    b. Rem
    c. Sv
    d. B & C
4. A substantial radiation dose level is defined as a peak skin level dose of _____.
    a. 1 Gy
    b. 2 Gy
    c. 3 Gy
    d. 4 Gy
5. What level of supervision is it when the fluoroscopic physician is present in the room?
    a. General supervision
    b. Direct supervision
    c. Indirect supervision
    d. Personal supervision
6. What committee is responsible for tracking all sentinel events related to radiation safety.
    a. Quality Committee
    b. Patient Safety Committee
    c. National Radiation Safety Committee
    d. Executive Committee
7. Which of the following **is not** a responsibility of the radiation safety officer?
    a. Ensuring regulatory standards are followed
    b. Performing equipment compliance testing
    c. Ensuring personal monitoring devices are issued
    d. Supervising radiation surveys
8. Employees not wearing a lead apron should move at least _____ away from the beam prior to exposure.
    a. 5 feet
    b. 10 feet
    c. 15 feet
    d. 20 feet

9. Development of what equipment feature helps decrease radiation during fluoroscopy?
    a. Timer
    b. Last image hold
    c. Cumulative air kerma displayed
    d. B & C

Appendix A

10. Which of the following conditions may significantly lower the threshold for radiation injury?
    a. Previous large doses to the same body part
    b. Hyperthyroidism
    c. Diabetes
    d. All the above
11. To protect the patient during a fluoroscopic procedure, the x-ray tube should be kept as close to the patient as possible.
    a. True
    b. False
12. Which x-ray beam angulation minimizes the patient's radiation dose?
    a. Posterior-anterior
    b. Lateral
    c. Cranio-caudal
    d. B & C
13. What cine frame rate is commonly used for cardiac catheterization?
    a. 15 images per second
    b. 20 images per second
    c. 25 images per second
    d. 30 images per second
14. In manual fluoroscopy mode, operators must use as large a setting of _____ as possible.
    a. kV
    b. mA
    c. frame rate
    d. pulse rate
15. Operators must ensure a patient's _____ is not in the x-ray beam during lateral and oblique projections.
    a. Eyes
    b. Gonads
    c. Arms
    d. Thyroid
16. If a patient has radiation induced skin damage, what should be avoided in that area?
    a. Skin tears
    b. Biopsy
    c. Frequent dressing changes
    d. Certain antibiotic creams

Appendix B

17. Within weeks after a fluoroscopic exam, what skin dose may cause a transient erytherma or epilation?
    a. 1 – 4 Gy
    b. 2 – 5 Gy
    c. 3 – 6 Gy
    d. 4 – 7 Gy
18. A follow-up appointment should be scheduled for patients receiving what skin dose?
    a. 1 – 2.3 Gy
    b. 2 – 3.8 Gy
    c. 3 – 4.9 Gy
    d. 4 – 6.5 Gy
19. What skin dose range can cause itching?
    a. 1 – 3 Gy
    b. 3 – 7 Gy
    c. 4 – 9 Gy
    d. 5 – 10 Gy
20. The most severe skin injuries occur when the absorbed dose exceeds what level?
    a. 5 Gy
    b. 10 Gy
    c. 15 Gy
    d. 20 Gy
21. Any exposure that results in permanent skin damage is considered a _____.
    a. Significant incident
    b. Patient safety concern
    c. Sentinel event
    d. Transient event
22. With a skin dose of 2-5 Gy, what is the observed late effect?
    a. Epilation
    b. Erythema
    c. None
    d. A & B

Appendix C

23. What is the maximum occupational exposure to the fetus for the entire pregnancy?
    a. 3 mSv
    b. 4 mSv
    c. 5 mSv
    d. 6 mSv
24. What is the effective dose limit for staff who may have an office next to a fluoroscopic room?
    a. 1 mSv
    b. 2 mSv
    c. 3 mSv
    d. 4 mSv

25. To decrease hand exposure during a biopsy what should be used?
    a. Sterile lead gloves
    b. Needle holder
    c. Forceps
    d. Extension device
26. What is the preferred thickness of a lead apron?
    a. .25 mm
    b. .30 mm
    c. .35 mm
    d. .5 mm
27. Staff exposed to back and side scatter radiation should wear a wrap around apron with at least _____ of lead equivalent protection.
    a. .25 mm
    b. .30 mm
    c. .35 mm
    d. .5 mm

Appendix D

28. Newer fluoroscopic systems display cumulative skin dose.
    a. True
    b. False
29. Fluoroscopy quality assurance should include which of the following?
    a. Image acquisition through image display
    b. Monitoring luminance and calibration of the image display monitor
    c. Equipment testing by a medical physicist
    d. All the above

Appendix E

30. What type of supervision is required of a resident for all potentially high radiation dose procedures?
    a. Indirect supervision
    b. Direct supervision
    c. General supervision
    d. Personal supervision
31. A speech pathologist may perform fluoroscopy under _____ supervision.
    a. Indirect
    b. Direct
    c. Personal
    d. General

Enhancing Radiation Protection During Pediatric Fluoroscopy

32. Children are more radiosensitive than adults for about _____ of cancers.
    a. 20%
    b. 30%
    c. 40%
    d. 50%
33. Children **do not** receive a larger radiation dose when the fluoroscopic equipment setting are exclusively for adults.
    a. True
    b. False
34. The primary biologic effect of ionizing radiation is damage to what?
    a. DNA
    b. Tissue
    c. Skin
    d. Eyes
35. Most DNA damage is repaired within _____ hours.
    a. 12
    b. 24
    c. 36
    d. 48
36. Who is not a key member of the fluoroscopic imaging team?
    a. Radiologic technologist
    b. Radiologist
    c. Radiology RN
    d. Medical physicist
37. All fluoroscopic team members must know how to adjust:
    a. Dose settings
    b. Positioning
    c. Collimation
    d. A & C
38. Which of the following **is not** a responsibility of the radiologic technologist?
    a. Calibration of the equipment
    b. Selecting proper fluoroscopic equipment settings
    c. Preparing supplies
    d. Static imaging before and after the exam
39. X-rays are created when a high-energy _____ collides with the anode of the x-ray tube.
    a. Proton
    b. Neutron
    c. Electron
    d. Atom
40. Excluding patient size, what factor affect a patient's total radiation dose?
    a. Design and configuration of the fluoroscopic machine
    b. Machine operation by the fluoroscopist
    c. Machine manufacturer
    d. A & B

41. What is the unit of measure for kerma?
    a. Gray
    b. Rem
    c. Millicurie
    d. Millirem
42. Kerma area product (KAP) **is** affected by the distance from the focal spot.
    a. True
    b. False
43. What is the energy imparted per unit mass by ionizing radiation to matter at a specific point called?
    a. Effective dose
    b. Absorbed dose
    c. Peak dose
    d. Cumulative dose
44. What is the unit of measure for equivalent dose?
    a. Sv
    b. mSv
    c. Rem
    d. A & B
45. Which of the following is a source of background radiation?
    a. Sun
    b. Earth's crust
    c. Food we eat
    d. All the above
46. Background radiation results in an annual whole absorbed dose of approximately _____.
    a. 2 mSv
    b. 3 mSv
    c. 4 mSv
    d. 5 mSv
47. What is the amount of tissue that will reduce the quantity of -x-rays to half the original number called?
    a. Cross sectional layer
    b. Half value layer
    c. Equivalent layer
    d. Effective layer
48. Subject contrast depends on the:
    a. Difference in thickness of the body part imaged and the atomic number
    b. Density differences between two body parts
    c. Quality of the x-ray beam
    d. All the above