Radiation Protection in Diagnostic and Interventional Procedures

1. What factor for dose reduction should be optimized in the design of an x-ray room?
    a. Time
    b. Distance
    c. Shielding
    d. All the above
2. What should be installed in rooms using fluoroscopy, such as for imaging-guided interventional procedures?
    a. Ceiling-mounted protective screens
    b. Table-mounted leaded curtains
    c. Tableside console
    d. A & B
3. Wall shielding should be at least _____ high.
    a. 1.0 m
    b. 1.5 m
    c. 2.0 m
    d. 2.5 m
4. A _____ should be placed at the control console to shield staff from radiation.
    a. Barrier
    b. Sign
    c. Reminder
    d. Door
5. What should be used at the entrances of controlled areas to prevent inadvertent entry?
    a. Signs
    b. Warning lights
    c. Barriers
    d. A & B
6. Mobile facilities should be built so that protection is optimized mainly through _____.
    a. Length of procedure
    b. Shielding
    c. Movement
    d. Number of procedures
7. To determine shielding thickness the dose that would be received without shielding is calculated by using _____.
    a. Workload values
    b. Air kerma
    c. Estimated dose
    d. Patient measurement
8. What Commission has published international standards applicable to medical radiological equipment?
    a. International Electronic Commission
    b. Interactive Electronics Commission
    c. International Electrotechnical Commission
    d. International Electric Commission

9. Which of the following are general design features for medical radiological equipment?
    a. Means to immediately detect any malfunction of a single component
    b. Means to minimize the frequency of human error
    c. Operating parameter for radiation generators
    d. All the above
10. What is the minimum tube potential for dental equipment?
    a. 55 kVp
    b. 60 kVp
    c. 65 kVp
    d. 70 kVp
11. Which of the following **is not** a design feature for mammography equipment?
    a. Digital subtraction
    b. Various anode and filter combinations
    c. Magnification views
    d. Display on the console of a dose index
12. Design features for interventional procedures should include a radiation generator with a capability of at least _____.
    a. 65 kW
    b. 75 kW
    c. 80 kW
    d. 85 kW
13. True or false. All digital radiologic equipment should have connectivity to RIS and PAS.
    a. True
    b. False
14. In the classification of areas, all x-ray rooms should be designated as _____ areas.
    a. Private
    b. Public
    c. Accessible
    d. Controlled
15. A _____ area may involve areas surrounding x-ray rooms.
    a. Supervised
    b. Private
    c. Controlled
    d. Public
16. Control panel areas should be classified as _____.
    a. Controlled area
    b. Supervised area
    c. Public area
    d. A & B
17. For mobile radiography, people should be at least ____ away from the patient during the exposure.
    a. 2 m
    b. 3 m
    c. 4 m
    d. 5 m

18. Which of the following **is not** a way to reduce occupational radiation in the emergency department?
    a. Wearing lead aprons
    b. Primary beam should be directed away from staff and other patients
    c. Staff should keep as close to the patient as possible
    d. Mobile shields should be used when possible
19. For dental x-ray, a typical distance of _____ away from the patient is recommended.
    a. 1 m
    b. 2 m
    c. 3 m
    d. 4 m
20. True or false. Specific equipment designed for interventional procedures the dose rate in the vicinity of the patient is lower on the beam exit side of the patient.
    a. True
    b. False
21. A higher incidence of radiation injury to the _____ has been reported for interventionists and nurses performing image-guided procedures.
    a. Lens of the eye
    b. Hands
    c. Reproductive organs
    d. Thyroid gland
22. Wrap-around aprons used during interventional procedures should be from the neck down to at least _____ below the knees.
    a. 4 cm
    b. 6 cm
    c. 8 cm
    d. 10 cm
23. What is a non-lead material that can be used in personal protective equipment?
    a. Tin
    b. Aluminum
    c. Copper
    d. Pewter
24. What can be used to verify the occupational doses of personnel whose work involves radiation exposure?
    a. Safety meeting minutes
    b. Staff safety reports
    c. Workplace monitoring
    d. Equipment dose logs
25. For monitoring skin and extremities, what depth is used to provide an estimate of the equivalent dose?
    a. 0.06 mm
    b. 0.07 mm
    c. 0.08 mm
    d. 0.09 mm

26. For monitoring the lens of the eye, what depth is used to provide an estimate of the equivalent dose?
    a. 1 mm
    b. 2 mm
    c. 3 mm
    d. 4 mm
27. For individuals that have one dosimeter and always wear an apron, where should the dosimeter be worn?
    a. On the front torso at should or collar level outside the apron
    b. On the front torso on the side closest to the radiation source
    c. On the front of the torso at the waist outside the apron
    d. On the front of the torso anywhere under the apron
28. For staff performing diagnostic and interventional procedures, a monthly dose higher than _____could be investigated.
    a. 0.4 mSv
    b. 0.5 mSv
    c. 0.6 mSv
    d. 0.7 mSv
29. Values higher than _____ per month for hand and finger dosimeters should be investigated.
    a. 13 mSv
    b. 14 mSv
    c. 15 mSv
    d. 16 mSv
30. True or false. Specific training should be provided when new medical radiological procedures, equipment, software, and technologies are introduced.
    a. True
    b. False
31. In determining the appropriateness of a radiologic procedure, what questions should be asked by the referring medical practitioner?
    a. Has it already been done
    b. Is it needed
    c. Is it needed now
    d. All the above
32. Under general operational considerations, what is an example of a form of patient identification?
    a. Name
    b. Date of birth
    c. Address
    d. All the above
33. Routine diagnostic CT examination of the pelvic region with and without contrast can lead to a dose of ____ to the uterus.
    a. 40 mSv
    b. 50 mSv
    c. 55 mSv
    d. 60 mSv

34. What should be developed that specifies the operating parameters to be used for diagnostic radiology procedures?
    a. Written technique charts
    b. Policies
    c. Procedures
    d. Guidelines
35. In developing protocols for radiography, what factor should be considered?
    a. Exposure time
    b. Focal spot size
    c. Filtration
    d. All the above
36. Additional consideration for mammography includes _____.
    a. Adequate compression of the breast
    b. Breast tissue composition
    c. Age of the patient
    d. A & B
37. Special attention should be given to developing protocols for _____ adapted for body size and age.
    a. Children
    b. Women
    c. Men
    d. Young adult
38. CBCT is also known as _____.
    a. Flat panel CT
    b. C-arm CT
    c. Cone beam volume CT
    d. All the above
39. The choice of imaging modality for the guidance of interventional procedures will depend on what?
    a. Age of the patient
    b. Area of interest
    c. Clinical scenario
    d. Available equipment
40. Successful interventions are heavily reliant upon _____.
    a. Staff training
    b. Patient cooperation
    c. Patient age
    d. Radiologist experience
41. Calibration requirements for radiology equipment and dosimetry equipment are the responsibility of the _____.
    a. Medical physicist
    b. Safety committee
    c. Administration
    d. Radiologist

42. In mammography, what dosimetric quantity **is not** used?

a. Incident air kerma
b. Entrance surface air kerma
c. Mean glandular dose
d. Median glandular dose