

Fluoroscopy safety test questions.

Select the one best response below

1. All of the following statements regarding stochastic effects of radiation exposure are true **except**:
 - a. probability of effect increases with dose
 - b. can lead to genomic instability
 - c. requires a threshold dose
 - d. are associated with genetic mutations
 - e. may promote cancer induction

2. Pregnant radiation workers are legally required to disclose their pregnancy to the Radiation Safety Office(r).
 - a. true
 - b. false

3. As distinct from a single collar badge, using two dosimeters , *i.e.*, “double badging” (one collar and one body badge) of fluoroscopy personnel permits the following:
 - a. more accurate measurement of “under apron” deep dose
 - b. an estimate of lens dose
 - c. measurement of both photons and beta dose
 - d. accurate readings despite how the badges are worn
 - e. an extremity dose estimate

6. At 10 inches from the patient during a fluoroscopy, the exposure rate is 40 mR/hr. If you move to a distance of 20 inches, the new exposure rate is:
 - a. 10 mR/hr
 - b. 15 mR/hr
 - c. 20 mR/hr
 - d. 30 mR/hr

e. 80 mR/hr

7. Protective lead (Pb) barriers include aprons and thyroid collars. Massachusetts regulations and BWH Radiology Policy require that they be worn. An appropriate lead equivalent thickness for these aprons is:

- a. 0.05 mm
- b. 0.10 mm
- c. 0.50 mm
- d. 2.00 mm

8. The following statements regarding ALARA notifications are true except:

- a. ALARA = As Low As Reasonably Achievable
- b. ALARA notices reflect a calculated radiation dose well under the MPD
- c. ALARA notices are punitive and disciplinary in nature
- d. ALARA notices are discussed at Radiation Safety Committee
- e. ALARA notices are used as a tool to decrease staff dose.

9. How much fluoroscopy time will be required to reach a cumulative skin dose of 5 Gy if the skin dose rate = 100 mGy/min?

- a) 5 min
- b) 30 min
- c) 50 min
- d) 100 min

10. If you hear a continuously sounding alarm only when fluoroscopy is being used, you might assume:

- a) the x-ray tube is too close to the patient
- b) the high-dose-rate “boost” fluoro mode is on
- c) the device must be malfunctioning
- d) the x-ray tube C-arm is maximally angled

11.

13. The primary purpose of x-ray tube filtration is

- a. to increase heat load on the x-ray tube
- b. to decrease heat load on the x-ray tube
- c. to reduce skin dose to the patient
- d. to improve image resolution
- e. to improve image contrast

14. In general, the rationale for keeping the fluoroscopy image intensifier/detector as close to the patient as possible is to

- a. reduce patient dose
- b. reduce personnel dose
- c. increase image magnification
- d. both a. and b.
- e. none of the above

15. Changing the fluoroscopy image intensifier/detector FOV from non-magnification to magnification mode generally

- a. increases patient dose while reducing region of visible anatomy
- b. decreases patient dose while reducing region of visible anatomy
- c. increases patient dose while increasing region of visible anatomy
- d. leaves patient dose and region of visible anatomy unchanged

16. The FDA regulatory limit of entrance exposure rate (EER) for normal mode fluoroscopy to establish compliance is _____.

- a. 100 R/min
- b. 10 R/min.
- c. 1 R/min.
- d. 500 mGy/min.
- e. 0.5 mGy/min.

17. Which of the following is true regarding interventional procedures (i.e., PTCA, RF ablation, etc.) performed using fluoroscopy

- a. entrance skin doses never reach 1000 mGy
- b. entrance skin doses can exceed 5000 mGy
- c. increasing fluoroscopy time has no effect on skin dose
- d. entrance skin doses typically exceed 10 Gy

- e. entrance skin dose is not an important quantity for risk assessment during these procedures

18. In general, with all other technical exam factors constant, increasing fluoroscopy exposure rate _____.

- a. decreases image quality
- b. has no effect on image quality
- c. improves image quality
- d. reduces fluoroscopy time
- d. reduces scatter radiation

19. In general, fluoroscopy exposure rate increases for a large patient compared to a small patient because _____.

- a. increased penetration of x-ray beam is required
- b. decreased penetration of x-ray beam is required
- c. an increase in scatter radiation is required
- d. more x-ray photons are removed by filtration
- e. x-ray beam collimation is usually increased

20. Using pulsed fluoroscopy compared to normal mode fluoroscopy results in ____.

- a. a decrease in fluoroscopy exposure rate
- b. increased scatter radiation
- c. potential decrease in patient dose by 30-50%.
- d. both a. and b.
- e. both a. and c.

22. Pregnant patients should

- a. never undergo fluoroscopy examinations.
- b. always undergo fluoroscopy examinations
- c. undergo fluoroscopy exams only when there is an absolute medical necessity

24. Congenital anomalies may arise from high dose *in utero* exposures which take place during which gestational period?

- a. 0-10 days
- b. 2-6 weeks
- c. 8-15 weeks
- d. last trimester

25. Skin is considered as radiosensitive a tissue as the gonads.

- a. true
- b. false