

# RADIATION MANAGEMENT CREDENTIALING TEST

## FOR PHYSICIANS WHO USE FLUOROSCOPIC EQUIPMENT

**PURPOSE:** The FDA Fluoroscopic Health Advisory recommends demonstration of competence for the use of fluoroscopic x-ray equipment. Successful completion of this test (80% correct) documents that the physician has passed an examination testing her/his knowledge of fluoroscopic radiation management.

NAME: \_\_\_\_\_ SS#: \_\_\_\_\_ SERVICE: \_\_\_\_\_

CIRCLE ONE: STAFF PHYSICIAN PHYSICIAN FACULTY FELLOW RESIDENT

Phone # \_\_\_\_\_ Beeper # \_\_\_\_\_ Date: \_\_\_\_\_

### Complete all 20 items (2 pages)! Not for use with CME program!

MATCH ITEMS 1 - 6 WITH THE CORRECT LETTERED SUBJECT

- |                 |                                                                         |
|-----------------|-------------------------------------------------------------------------|
| _____ 1) <1 mGy | a) annual effective whole-body dose limit for physicians                |
| _____ 2) 1 mGy  | b) lowest dose theoretically capable of inducing a cancer               |
| _____ 3) 50 mGy | c) annual effective whole-body dose limit for a visitor to the hospital |
| _____ 4) 1 Gy   | d) threshold for clinically detectable radiation-induced cataract       |
| _____ 5) 3 Gy   | e) threshold for temporary epilation                                    |
| _____ 6) 14 Gy  | f) threshold for desquamation                                           |

CIRCLE THE ONE CORRECT ANSWER FOR QUESTIONS 7 - 20

7. The principal source of radiation exposure to personnel during fluoroscopy is:
- a) scatter radiation from the patient
  - b) penetration of x rays through the X-ray tube housing
  - c) scatter radiation from inside the image intensifier
  - d) ambient radiation scattered from the walls and floors
8. If a physician moves half the distance toward a patient being fluoroscoped, the dose rate at her/his new position will be:
- a) increased by a factor of 4
  - b) increased by a factor of 2
  - c) increased by a factor of 1.5
  - d) unchanged
9. How much fluoroscopy time will be required to reach the threshold for radiation-induced main erythema (6 Gy) given the following data: kVp = 80; mA = 4; skin dose rate = 30 mGy/min?
- a) 20 min
  - b) 1.5 hr
  - c) 3.3 hr
  - d) 4.5 hr
10. How much fluoroscopy time will be required to reach the threshold for radiation-induced main erythema (6 Gy) given the following data: kVp = 120; mA = 10; skin dose rate = 300 mGy/min?
- a) 20 min
  - b) 1.5 hr
  - c) 3.3 hr
  - d) 4.5 hr
11. The most likely radiation-induced effect following doses of less than 100 mGy delivered to the human fetus during the eighteenth week of gestation is:
- a) mental retardation
  - b) organ abnormality
  - c) small head size
  - d) cancer
12. Increasing kVp and reducing mA is primarily a compromise between:
- a) exposure rate to the patient and contrast
  - b) exposure rate to personnel and field size
  - c) field size and contrast
  - d) exposure rate to personnel and magnification

13. Which one of the following is not indicative of good radiation management?
- Monitor total fluoroscopy time for each procedure.
  - Always use a grid.
  - Cone collimators down as far as practicable.
  - Place II as close to the patient as practicable.
14. Fluoroscopically-induced cancers
- are always associated with skin reactions
  - may occur at any X-ray exposure
  - usually appear at one to two years after exposure
  - result primarily from faulty equipment
15. The fluoroscopic operating factors displayed on your monitor are 120 kVp and 12 mA. Which one of the following statements is true for a conventionally filtered beam?
- The display must be wrong.
  - The X-ray tube is shorted.
  - The skin entrance dose rate is extremely high.
  - The skin entrance dose rate is unusually low.
16. During fluoroscopy you hear a continuously sounding beep or chime that ceases when fluoroscopy is off. You reset the five-minute timer but the sound persists. You should assume that:
- The X-ray source is too close to the patient.
  - A special high-dose-rate mode is engaged.
  - The C-arm is at maximum angulation or maximum extension.
  - Your five-minute timer is broken.
17. Regarding radiation film badges for personnel, which one is not true?
- high readings indicate that an adjustment to technique may be appropriate.
  - fluoroscopists are required to wear them during procedures;
  - the badge reading remains accurate if returned four months after the monitoring period;
  - the badge should be worn anteriorly at collar level outside the protective apron;
18. Using a C-arm with a fixed distance between the X-ray tube and the image intensifier, the X-ray source was 50 cm from the patient's skin. The physician repositioned the patient's table so that the skin was 60 cm from the source. What happened?
- image magnification is increased by ~20%
  - scatter in the room went up by 50%
  - dose rate to patient decreased by ~35%
  - kVp increased by ~10 kVp, tube current went down
19. Which one of the following protection devices is required for personnel not behind a radiation barrier during fluoroscopy procedures?
- leaded glasses
  - lead or protective apron
  - leaded surgical gloves
  - thyroid shield
20. Which one of the following is true regarding sound fluoroscopic radiation management?
- leaded surgical gloves protect your hands so you can keep them in the beam during procedures;
  - keeping the fluoroscopy on while directing your attention toward the technologist is accepted practice;
  - erythema is more likely to occur in a large patient than in a small patient undergoing an identical procedure;
  - acquiring extra digital images for a teaching file is accepted practice.

PLEASE RETURN  
COMPLETED TEST TO THE  
MEDICAL STAFF OFFICE