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) 5 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 = 120; mA = 10; skin dose rate = 300 mGy/min?
   a) 20 min
   b) 1.5 hr
   c) 3.3 hr
   d) 4.5 hr

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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?
   a) Monitor total fluoroscopy time for each procedure.
   b) Always use a grid.
   c) Cone collimators down as far as practicable.
   d) Place II as close to the patient as practicable.

14. Fluoroscopically-induced cancers
   a) are always associated with skin reactions
   b) may occur at any X-ray exposure
   c) usually appear at one to two years after exposure
   d) 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?
   a) The display must be wrong.
   b) The X-ray tube is shorted.
   c) The skin entrance dose rate is extremely high.
   d) 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:
   a) The X-ray source is too close to the patient.
   b) A special high-dose-rate mode is engaged.
   c) The C-arm is at maximum angulation or maximum extension.
   d) Your five-minute timer is broken.

17. Regarding radiation film badges for personnel, which one is not true?
   a) high readings indicate that an adjustment to technique may be appropriate.
   b) fluoroscopists are required to wear them during procedures;
   c) the badge reading remains accurate if returned four months after the monitoring period;
   d) 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?
   a. image magnification is increased by −20%
   b. scatter in the room went up by 50%
   c. dose rate to patient decreased by −35%
   d. 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?
   a) leaded glasses
   b) lead or protective apron
   c) leaded surgical gloves
   d) thyroid shield

20. Which one of the following is true regarding sound fluoroscopic radiation management?
   a) leaded surgical gloves protect your hands so you can keep them in the beam during procedures;
   b) keeping the fluoroscopy on while directing your attention toward the technologist is accepted practice;
   c) erythema is more likely to occur in a large patient than in a small patient undergoing an identical procedure;
   d) acquiring extra digital images for a teaching file is accepted practice.