Minimizing Risks

from

Fluoroscopic X Rays

Bioeffects, Instrumentation, and Examination

A Credentialing Program for Anesthesiologists, Cardiologists, Gastroenterologists, Interventionalists, Orthopedists, Physiatrists, Pulmonologists, Radiologists, Surgeons, and Urologists, and Radiographers

Fourth Edition
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Louis K. Wagner, Ph.D., DABR, FACR, FAAPM
Professor of Radiological Physics
The University of Texas Medical School at Houston

and

Benjamin R. Archer, Ph.D., DABR, FACMP, FAAPM
Professor of Radiological Science
Baylor College of Medicine

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: _____ **SERVICE:**_____

Phone # _____ **Beeper #**_____ **Date:** _____

Complete all 25 items (2 pages)! *Not* for use with CME program!

MATCH ITEMS 1 - 6 WITH THE CORRECT LETTERED SUBJECT

_____**1.** 0.5 mSv	a) annual effective whole-body dose limit for physicians
_____**2.** 1 mSv	b) annual effective whole-body dose limit for a visitor to the hospital
_____**3.** 50 mSv	c) monthly dose limit to conceptus of pregnant worker
_____**4.** 6 Gy	d) threshold for radiation-induced delayed erythema at ~ 2 wks post procedure
_____**5.** 18 Gy	e) threshold for radiation-induced dermal necrosis

CIRCLE THE ONE CORRECT ANSWER FOR QUESTIONS 6- 25

6. At an entrance skin dose rate of 250 mGy/minute, in how many minutes of fluorosopy on-time will the threshold for skin atrophy be reached?

a. 20
b. 40
c. 80
d. 120

7. Which one of the following actions is most likely to increase the entrance skin dose rate to a patient?

a. remove the grid
b. position the image receptor closer to the patient
c. position the x-ray tube closer to the patient
d. use a larger field of view.

8. Why are entrance skin dose rates to larger patients generally greater than those to smaller patients?

a. Skin is physically more dense in larger patients
b. Amount of tissue in path of beam is greater
c. More scatter radiation is produced
d. Collimation is less effective

9. The principal threat to health from chronic very low-level whole-body exposure to radiation is:

a. radiation-induced heritable reproductive effects
b. radiation-induced cancer
c. radiation-induced cataract
d. radiation-induced hair loss

10. For an adult abdomen, the radiation level where the beam enters the patient is approximately how many times greater than that which exits the patient?

a. 2
b. 5
c. 20
d. 100

11. What does a personal radiation badge do?

a. protects the wearer from radiation
b. monitors exposures to radiation to identify whether safety should be improved
c. changes color if radiation levels are too high
d. alerts the wearer of the presence of radiation

12. Regarding radiation exposure to the hands, what action is the best practice philosophy?

a. wear radiation protective surgical gloves when you want to put your hands in the beam
b. keep your hands out of the beam except rarely when it is essential for the care of the patient
c. there is no particular concern about the hands since they are radio resistant extremities
d. wash your hands well after the procedure to remove residual radiation

13. In what year did the FDA issue an advisory on high radiation exposures to patients from fluoroscopy?

a. 1994
b. 1997
c. 2000
d. 2003

14. What is "high-level" control?

a. When engaged it delivers the lowest dose rate to the patient for highest benefit/risk.
b. This control manages only the quality of the image and has no affect on radiation dose rate to the patient.
c. High-level control is the standard mode of fluoroscopy operation.
d. High-level control boosts radiation output beyond standard levels and can be a dangerous mode.

15. In the variable pulsed mode of operation which one of the following is FALSE?

a. The x-ray beam is pulsed at a selectable number of times per second.
b. Dose rates are lower for lower pulse rates.
c. The dynamics of motion appear less fluid in the lower pulse rates.
d. Scatter radiation in the room is more intense.

16. Regarding the thyroid of a radiation worker, which one of the following is TRUE?

a. The maximum permissable regulatory dose for the thyroid is the lowest of all organs.
b. Wearing a thyroid shield during fluoroscopy is usually optional.
c. Exposure of the thyroid often leads to hormonal dysfunction.
d. The latent period from radiation exposure to the diagnosis of thyroid cancer is typically one year.

17. 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

18. If a person moves twice as far away from the irradiated area of the patient, the air kerma rate at the new position will be:

a. increased by 10%
b. unchanged
c. decreased by 50%
d. decreased by 75%

19. A reduction in radiation output per pulse of pulsed fluoroscopy results in what change in the appearance of the image?

a. noisier image
b. motion blurred image
c. more contrast
d. less fluid (more jerky) motion

20. Collimation does **NOT:**

a. reduce dose rate to the entrance skin site.
b. reduce stochastic risks to the patient.
c. reduce scatter radiation in the room.
d. reduce scatter radiation reaching the image recep tor.

For the following questions refer to the picture below. Circle the letter that identifies the appropriate location of the component in question.

21. Separator cone	A	B	C	D	E	F
22. Collimator blades	A	B	C	D	E	F
23. Grid	A	B	C	D	E	F
24. Image intensifier	A	B	C	D	E	F
25. X-ray tube	A	B	C	D	E	F