

Beam Restricting Devices

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ___ 1. The most commonly used beam restricting device is the _____.
a. extension cone
b. variable collimator
c. aperture diaphragm
d. compression device
- ___ 2. The use of _____ improves contrast and reduces patient dose.
a. collimation
b. high kVp
c. low kVp
d. less filtration
- ___ 3. How can you improve image contrast with a heavy patient without increasing patient dose?
a. Lower kVp and raise mAs.
b. Use tight collimation.
c. Raise kVp and lower mAs.
d. Do both A and B.
- ___ 4. Decreasing collimation results in:
a. A smaller field size
b. A larger field size
c. Decreased patient dose
d. Less scatter production
- ___ 5. The smaller the volume of tissue irradiated, the:
a. Greater the amount of scatter produced
b. Less the amount of scatter produced
c. Greater the need to use a grid
d. A and C
- ___ 6. A beam restricting device that has 2 or 3 sets of lead shutters is a(n):
a. Collimator
b. Aperture diaphragm
c. Cone
d. Cylinder
- ___ 7. The purpose of the mirror inside the collimator is to:
a. Allow the patient to see the radiographer
b. Allow the radiographer to see the patient
c. Project a light field onto the patient
d. None of the above
- ___ 8. Which of the following factors affects the quantity of scatter radiation fog on a radiograph?
1. Field size
2. Focal spot size

3. kVp
- 1 and 2 only
 - 1 and 3 only
 - 2 and 3 only
 - 1, 2, and 3
- ___ 9. If the size of the x-ray field increases, what happens to scatter radiation fog?
- It increases.
 - It decreases.
 - It remains the same.
 - It increases for the thorax, abdomen, and pelvis projections only.
- ___ 10. What is one of the most important things a technologist can do to control scatter radiation?
- Reduce the thickness of the part.
 - Maintain the correct field size.
 - Use the exposure technique chart.
 - Use the correct grid.
- ___ 11. How can you improve image contrast with a heavy patient without increasing patient dose?
- lower kVp and raise mAs
 - use tight collimation
 - raise kVp and lower mAs
 - Both a and b.
- ___ 12. Which of the following influences the amount of scatter radiation striking the image receptor but not the production of scatter radiation?
- Reduce the exposure field size.
 - Reduce the tissue thickness.
 - Increase the grid ratio.
 - Ask a patient with a large abdomen to lie prone instead of supine.

True/False

Indicate whether the statement is true or false.

- ___ 13. Digital IRs are less sensitive to scatter radiation than are film-screen IRs.
- True
 - False
- ___ 14. Increasing collimation results in reduced patient exposure, increased field size, and reduced scatter production.
- True
 - False
- ___ 15. As collimation decreases, exposure to the IR increases.
- True
 - False

Beam Restricting Devices Answer Section

MULTIPLE CHOICE

1. ANS: B
The most commonly used beam restricting device is the variable collimator.

PTS: 1 DIF: Moderate REF: page 193
OBJ: Discuss three devices developed to minimize scatter radiation.
2. ANS: A
The use of collimation improves contrast and reduces patient dose.

PTS: 1 DIF: Moderate REF: page 187
OBJ: Describe beam-restricting and its effect on patient dose and image quality.
3. ANS: B
You can improve image contrast with a heavy patient without increasing patient dose by using tight collimation.

PTS: 1 DIF: Moderate REF: page 193
OBJ: Describe beam-restricting and its effect on patient dose and image quality.
4. ANS: B
Decreased collimation is the same as less beam restriction and results in a larger field size, increased patient dose, and more scatter production.

PTS: 1 OBJ: 4
5. ANS: B
The smaller the volume of tissue, the less scatter is produced.

PTS: 1 OBJ: 3
6. ANS: A
The collimator, or variable aperture diaphragm, includes two or three sets of lead shutters, some of which are adjustable.

PTS: 1 OBJ: 4
7. ANS: C
The mirror allows the radiographer to see a light field on the patient, representing the x-ray field that will be produced.

PTS: 1 OBJ: 4
8. ANS: B PTS: 1 REF: Page 111
9. ANS: A PTS: 1 REF: Page 111
10. ANS: B PTS: 1 REF: Page 111
11. ANS: B
You can improve image contrast with a heavy patient without increasing patient dose by using tight collimation.

PTS: 1 DIF: Moderate

OBJ: Describe beam-restricting and its effect on patient dose and image quality.

12. ANS: C

Increasing the grid ratio will absorb more of the scattered radiation and reduce the amount reaching the image receptor but will have no effect on the production of scatter.

PTS: 1

TRUE/FALSE

13. ANS: F

Digital IRs are more sensitive to low energy scatter radiation.

PTS: 1 OBJ: 15

14. ANS: F

Increasing collimation is the same as decreasing field size. It will result in reduced patient exposure, a smaller field size, and reduced scatter production.

PTS: 1 OBJ: 4

15. ANS: T

As collimation decreases (increased field size), there is increased exposure to the IR.

PTS: 1 OBJ: 3