

Grids 1

Multiple Choice

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

- ___ 1. Which of the following is **not** a way to reduce 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.
- ___ 2. 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.
- ___ 3. The height of the lead strips relative to the distance between the lead strips is the measure of:
- Contrast improvement
 - Grid ratio
 - Bucky factor
 - Grid selectivity
- ___ 4. Which of the following statements is true?
- If the height of the lead strips increases and the space between the grid strips decreases, the grid will be more effective at scatter removal.
 - If the height of the lead strip decreases and the space between the grid strips increases, the grid will be more effective at removing scatter radiation.
 - A high ratio grid removes little scatter.
 - A grid decreases scatter production.
- ___ 5. The number of lead strips per inch in a grid is a measure of:
- Grid selectivity
 - Grid ratio
 - Grid frequency
 - Contrast improvement number
- ___ 6. Due to increased potential grid cutoff, which would be the most challenging grid to use?
- Focused linear grid
 - Parallel linear grid
 - Cross-hatched grid
 - Reciprocrating grid
- ___ 7. If the height of the grid strip is 16 mm, the distance between the strips is 2 mm, and the strip is 0.3 mm thick, what is the grid ratio?
- 8:1
 - 10:1
 - 12:1
 - 16:1
- ___ 8. Which of the following statements is true?

- a. A high ratio grid prevents the production of scatter better than a low ratio grid.
 - b. A low ratio grid is more effective at removing scatter than a high ratio grid.
 - c. As grid ratio increases, the removal of scatter increases.
 - d. High ratio grids are less effective at removing scatter than low ratio grids.
- ___ 9. The amount of mAs required with a grid divided by the amount of mAs needed without a grid is the calculation that determines the:
- 1. Grid ratio
 - 2. Grid conversion factor
 - 3. Bucky factor
- a. 1 & 2 only
 - b. 1 & 3 only
 - c. 2 & 3 only
 - d. 1, 2, & 3
- ___ 10. Which grid design is manufactured to match the divergence of the x-ray beam?
- a. The parallel grid
 - b. The crossed grid
 - c. The reciprocating grid
 - d. The focused grid
- ___ 11. What is the grid conversion factor for a 12:1 ratio grid?
- a. $3 \times$
 - b. $4 \times$
 - c. $5 \times$
 - d. $6 \times$
- ___ 12. What occurs when the x-ray beam is not properly aligned with the grid strips?
- a. Bucky delamination
 - b. Grid cutoff
 - c. Increased exposure to the IR
 - d. Nothing
- ___ 13. In general, when should a grid be used?
- a. When part thickness exceeds 4 cm
 - b. When kV exceeds 40 kVp
 - c. When kV exceeds 1.02 MeV
 - d. When part thickness exceeds 10 cm
- ___ 14. If an excellent knee radiograph is produced using 10 mAs and an 8:1 ratio grid, how much mAs will be needed if no grid is available?
- a. 2.5 mAs
 - b. 4 mAs
 - c. 8 mAs
 - d. 10 mAs
- ___ 15. Changing from an 8:1 grid to a 12:1 grid, along with making the appropriate adjustments, will result in:
- 1. Increased patient dose
 - 2. An image with increased contrast
 - 3. Using more mAs
- a. 1 & 2 only
 - b. 1 & 3 only

- c. 2 & 3 only
- d. 1, 2, & 3

- _____ 16. Grid ratio can be expressed mathematically as:
- a. Thickness of lead strips divided by distance between them
 - b. Height of lead strips divided by distance between them
 - c. Height of lead strips divided by thickness of lead strips
 - d. Length of lead strips divided by distance between them
- _____ 17. Grid ratios range from:
- a. 2:1 to 6:1
 - b. 4:1 to 16:1
 - c. 10:1 to 24:1
 - d. 20:1 to 32:1
- _____ 18. The recommended SIDs that can be used with a focused grid describes the:
- a. Focal distance
 - b. Convergent point
 - c. Focal range
 - d. Convergent line
- _____ 19. Grids that move during the exposure:
- a. Are reciprocating grids
 - b. Move from top to bottom
 - c. Are part of the Potter-Bucky diaphragm
 - d. A and C
- _____ 20. Patient dose increases when:
1. Changing from a higher to a lower grid ratio
 2. Changing from a lower to a higher grid ratio
 3. A grid is used
- a. 1 & 2 only
 - b. 1 & 3 only
 - c. 2 & 3 only
 - d. 1, 2, & 3

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Answer Section

MULTIPLE CHOICE

1. ANS: C
Increasing the grid ratio will reduce the amount of scatter radiation reaching the image receptor but will have no effect on the production of scatter.

PTS: 1 OBJ: 3
2. 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 OBJ: 6
3. ANS: B
Grid ratio is determined by dividing the height of the lead strips by the distance between them.

PTS: 1 OBJ: 8
4. ANS: A
A high ratio grid is more effective at absorbing scatter radiation. Increasing the height of the lead strips and decreasing the distance between them will result in a higher ratio grid.

PTS: 1 OBJ: 7
5. ANS: C
The number of lead strips per inch or centimeter is a measure of grid frequency, one way of describing grid construction.

PTS: 1 OBJ: 7
6. ANS: C
The cross-hatched grid is most difficult to use because it does not allow for any angulation of the x-ray beam.

PTS: 1 OBJ: 9
7. ANS: A
Grid ratio is determined by dividing the height of the lead strips by the distance between them.

PTS: 1 OBJ: 8
8. ANS: C
Higher ratio grids are more effective at absorbing scatter radiation.

PTS: 1 OBJ: 7
9. ANS: C
The grid conversion factor (GCF) and Bucky factor are both names for the ratio between the amount of mAs needed with and without a grid.

PTS: 1 OBJ: 10
10. ANS: D
The focused grid is designed so that the lead strips are angled to match the divergence of the x-ray beam.

- PTS: 1 OBJ: 9
11. ANS: C
The Bucky, or grid conversion, factor for a 12:1 grid is 5. This means that going from no grid to a 12:1 grid will require 5 times the mAs.
- PTS: 1 OBJ: 10
12. ANS: B
Grid cutoff is the reduction in the number of transmitted photons that reach the image receptor, due to misalignment of the grid and the x-ray beam.
- PTS: 1 OBJ: 11
13. ANS: D
It is recommended that a grid be used when the kVp is higher than 60, along with a part that measures more than 10 cm.
- PTS: 1 OBJ: 6
14. ANS: A
Because the grid conversion factor for an 8:1 grid is 4, removing the grid will only require one fourth of the original mAs, or 2.5 mAs.
- PTS: 1 OBJ: 10
15. ANS: D
Increasing grid ratio will require additional mAs, resulting in a higher patient dose. It will also do a better job of cleaning up the scatter radiation, resulting in an image with higher, or a shorter scale, of contrast.
- PTS: 1 OBJ: 12
16. ANS: B
Grid ratio can be expressed mathematically as the height of lead strips divided between the distance between them.
- PTS: 1 OBJ: 8
17. ANS: B
Grid ratios range from 4:1 to 16:1.
- PTS: 1 OBJ: 7
18. ANS: C
The focal range is the recommended range of SIDs that should be used with a specific grid.
- PTS: 1 OBJ: 7
19. ANS: D
Reciprocating grids, part of the Potter-Bucky diaphragm, move from side to side during the exposure.
- PTS: 1 OBJ: 7
20. ANS: C
Any time a grid is used, there is additional exposure needed; changing from a lower to a higher ratio grid also requires additional exposure.
- PTS: 1 OBJ: 13