

# Geometric Unsharpness 1

## Multiple Choice

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

- \_\_\_ 1. The relationship of the focal spot size, SID, and OID specifically impacts the \_\_\_\_\_ of the image.
- visibility of recorded detail
  - image receptor unsharpness
  - geometric unsharpness
  - distortion
- \_\_\_ 2. During the selection of the focal spot size, the radiographer is really determining the:
- angle of the anode used.
  - actual size of the filament used.
  - number of electrons available for tube current.
  - distance the electrons travel from cathode to anode.
- \_\_\_ 3. The property of the x-ray beam that impacts the unsharpness on the radiograph is beam:
- quality.
  - quantity.
  - divergence.
  - restriction.
- \_\_\_ 4. The most detrimental factor to maximum recorded detail is:
- increased OID.
  - decreased SID.
  - large focal spot size.
  - motion.
- \_\_\_ 5. The misrepresentation of the size of an object is:
- shape distortion.
  - magnification.
  - foreshortening.
  - elongation.
- \_\_\_ 6. Using a small focal spot size may be prohibited due to the:
- amount of heat produced by x-ray exposure.
  - amount of exposure time used.
  - SID used.
  - speed of the film-screen system.
- \_\_\_ 7. The unit of line pairs per millimeter is a measure of:
- distortion.
  - resolution.
  - magnification.
  - quantum mottle.

- \_\_\_ 8. The SOD can be found by:
- adding SID and OID.
  - adding the MF to the OID.
  - subtracting the OID from SID.
  - subtracting the SID from the MF.
- \_\_\_ 9. What effect will increasing SID have on recorded detail?
- Increased recorded detail
  - Decreased recorded detail
  - No effect on recorded detail
- \_\_\_ 10. Providing clear instructions to the patient is a primary method for reducing unsharpness due to:
- shape distortion.
  - motion.
  - geometric properties.
  - size distortion.
- \_\_\_ 11. What is the geometric unsharpness when the focal spot measures 0.8 mm, the SID is 40 inches (100 cm), and the OID is 2 inches (5 cm)?
- 0.042 mm
  - 0.42 mm
  - 4.2 inches
  - 4.2 cm
- \_\_\_ 12. The smallest detail that can be detected in an image refers to:
- contrast resolution.
  - spatial resolution.
  - geometric unsharpness.
  - distortion.
- \_\_\_ 13. The ability of the system to differentiate between two small objects that have similar subject contrast refers to:
- contrast resolution.
  - spatial resolution.
  - geometric unsharpness.
  - distortion.
- \_\_\_ 14. All of the geometric factors and those that determine the amount of image distortion are equally important for digital and film-screen imaging.
- True
  - False
- \_\_\_ 15. SID indicators should be accurate within \_\_\_\_\_ of the SID.
- 1%
  - 2%
  - 5%
  - 10%

## Geometric Unsharpness 1

### Answer Section

#### MULTIPLE CHOICE

1. ANS: C  
Focal spot size, source to image receptor distance and object to image receptor distance impact the image's geometric unsharpness.  
  
PTS: 1
2. ANS: B  
When selecting large or small focal spot at the console, what's really being selected is the large or small cathode filament.  
  
PTS: 1
3. ANS: C  
Due to the divergence of the x-ray beam, a geometric relationship exists among the source of x-rays, the object, and the image receptor.  
  
PTS: 1
4. ANS: D  
Motion of the tube, part, or image receptor has the most detrimental effect on the recorded detail of the radiographic image.  
  
PTS: 1
5. ANS: B  
One aspect of distortion is magnification, or size distortion.  
  
PTS: 1
6. ANS: A  
Using a small focal spot size can be limited due to the amount of heat produced during the exposure being concentrated in a smaller area of the target.  
  
PTS: 1
7. ANS: B  
Line pairs per millimeter (Lp/mm) is a measure of an imaging system's resolution.  
  
PTS: 1
8. ANS: C  
The source-to-object distance (SOD) can be calculated by subtracting the OID from the SID.  
  
PTS: 1
9. ANS: A  
Increasing SID increases recorded detail by reducing the amount of geometric unsharpness and decreasing size distortion.  
  
PTS: 1
10. ANS: B

Along with short exposure times and immobilization techniques, clear patient instructions can help to reduce or eliminate patient motion.

PTS: 1

11. ANS: A

Geometric unsharpness is calculated by multiplying focal spot size by OID and then dividing by SOD.

PTS: 1

12. ANS: B

Spatial resolution refers to the smallest structure that can be visualized in an image.

PTS: 1

13. ANS: A

Different from spatial resolution, contrast resolution is the system's ability to image structures that are very similar in terms of subject contrast.

PTS: 1

14. ANS: A

SID, OID, focal spot size, and all the factors that affect distortion are just as important for digital imaging as they are for film-screen.

PTS: 1

15. ANS: B

It is important that SID be accurately measured. A quality control check requires that the SID indicator be accurate within 2% of the SID.

PTS: 1