

**Reading Hospital Medical Imaging Program
MI 132 – Imaging Principles and Equipment
Unit 6 – Radiographic Exposure Technique Part 3 (Class Preparation Assignment #13)
2022-2023**

Due: Thursday 11/17/2022

Textbook Chapter 11 (p. 137-152)

Objectives:

1. *Explain the affects focal spot size have on spatial resolution.*
2. *Calculate changes in mAs for changes in source-to-image receptor distance.*
3. *Summarize the relationship of factors that control and affect distortion (size and shape) and spatial resolution.*
4. *Describe the use of grids and beam restriction and their effect on image receptor exposure and image quality.*
5. *Describe the affects protective filtration has on receptor exposure.*
6. *Apply conversion factors for changes in the following areas: distance, grid, image receptors, reciprocity law and the 15% rule.*
7. *Recognize patient factors that may affect image receptor exposure.*
8. *Identify exposure factors that can affect patient radiation exposure.*

Questions:

1. **Complete the following chart. Use an 'X' within the chart to indicate if the factors influence receptor exposure, spatial resolution and/or distortion. Leave the space blank if there is no affect.**

	Receptor Exposure	Spatial Resolution	Distortion
Focal spot size			
SID			
OID			
Grid			
Tube filtration			
Beam restriction			
Motion			
Patient factors (size, pathology)			
Angle (tube, part, receptor)			

- a. For each 'X' placed in the chart above, explain the relationship that exists.
Focal spot size:

SID:

OID:

Grid:

Tube filtration:

Beam restriction:

Motion:

Patient Factors:

Angle (tube, part, receptor):

2. If SID is greater/lesser than what is required, what formula is used in order to maintain appropriate receptor exposure?

3. How should mAs be adjusted when adjusting from a 72 inch SID to a 56 inch SID? 40 inch to 56 inch SID?

4. How does an increased OID affect radiographic contrast?

5. What does the magnification factor (MF) indicate and how is it expressed mathematically?

6. If an object has an MF equal to 1.5, what percentage of magnification is demonstrated on the image?

7. What formula is used to calculate true object size?

8. How could you solve for image size if the object size and MF is known?

9. What formula is used to determine % of Magnification?

10. If a large OID is unavoidable, what can be done to decrease magnification and increase resolution?

11. What causes shape distortion?

12. How does beam restriction affect production of scatter radiation and therefore, radiographic contrast?

13. How do technical factors need to be adjusted if using a high frequency unit in comparison to a single phase unit?

14. How does a **significant** increase in tube filtration affect radiographic contrast?

15. How do technical factors need to be adjusted if using a compensating filter? How does this affect patient dose?

16. Explain how technical factors need to be adjusted for hypersthenic and asthenic patients.

17. For every change in part thickness of 4-5 cm, the radiographer should adjust the _____ by a factor of _____.

18. How does increased patient thickness affect scatter production and radiographic contrast?

19. Identify four ways a radiographer can reduce patient dose.