

Lab Experiment # 10

15% Rule and Effect

Computed Radiography (CR)

Purpose

This experiment is designed to demonstrate the effect of kilovoltage on exposure, contrast and visibility of the details; how to maintain exposure index and change contrast; and the effect of 15% rule on exposure index and contrast.

Learning Objectives

After completing this lab, you should be able to:

1. Use the laboratory equipment properly.
2. Set up the control console and ceiling tube mount correctly.
3. Function effectively in group work.
4. Perform the experiment independently.
5. Calculate the appropriate mAs to compensate for a change in kVp to maintain exposure index and change contrast – and vice versa.
6. Explain the 15% rule.
7. Summarize the mAs and kVp relationship when maintaining exposure index and changing contrast.
8. Predict the effect of the change in mAs and kVp on image contrast.
9. .

Materials Needed

- 10 x 12 IP
- Hand phantom
- Set of lead numbers

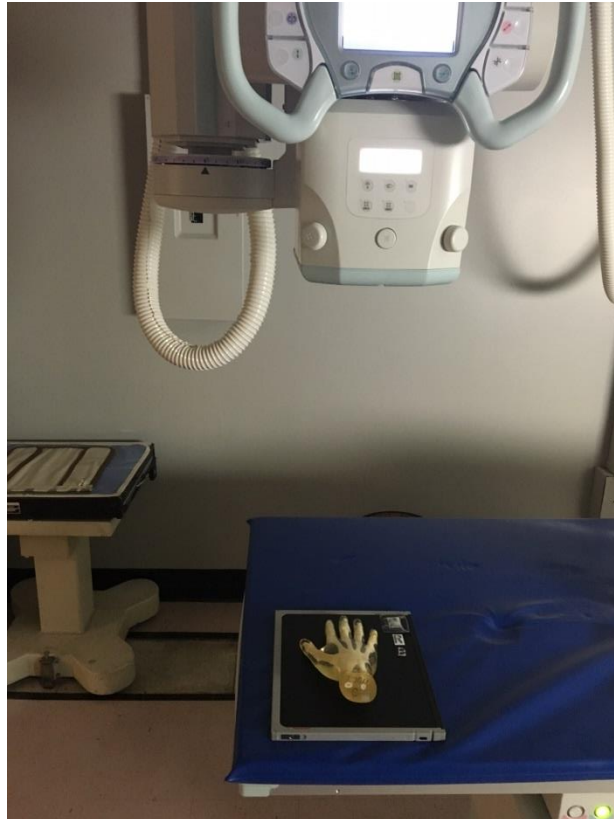
Procedure

Computed Radiography

Hand Radiograph

Instructions:

1. When adding images to your new exam use system diagnostic menu.
2. Use the Computed Radiography IR.
3. Direct the central ray **perpendicular** to the third MP joint.
4. Tape the appropriate ID markers onto the image receptor within the collimated light field so they do not obscure any areas of interest.
(The room, side and exposure number must be labeled on **all** radiographs.)
5. Set the x-ray tube, mode of operation and focal spot size as indicated on **Worksheet** .
6. Make all the exposures using the settings indicated on **Worksheet 1 and 2**.
7. In the worksheet write LGM numbers. Indicate overall image brightness and contrast of each image.



Worksheet 1 15% Effect

CR

	kVp	Focal Spot	SID	mAs	Bucky/TT	Pt. Dose	LGM
1	65	small	40" (100 cm)	2	TT		
2	75	small	40" (100 cm)	2	TT		
3	86	small	40" (100 cm)	2	TT		

Worksheet 1 15% Effect

LGM	Briefly describe the overall brightness and contrast of each image.
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1		
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2		
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3		
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Worksheet 2 15% Rule

CR

	kVp	Focal Spot	SID	mAs	Bucky/TT	Pt. Dose	LGM
4	65	small	40" (100 cm)	2	TT		
5	75	small	40" (100 cm)	1	TT		
6	86	small	40" (100 cm)	0.5	TT		

Worksheet 2 15% Rule

LGM	Briefly describe the overall brightness and contrast of each image.
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4		
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5		
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6		
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Answer the questions below and explain your answer.

1. Is there a difference in contrast between images 1,2, and 3?
2. Is there a difference in brightness between images 1,2, and 3?
3. Is there a difference in contrast between images 4,5, and 6?
4. Is there a difference in brightness between images 4,5, and 6?
5. Which exposure resulted in the highest patient dose?
6. What is the unit of patient dose?