

# Lab Experiment # 6

## Digital Radiography (DR) The 15% Effect and 15% Rule

### ***Purpose***

This experiment is designed to demonstrate the effect of kilovoltage on exposure index (EI), image contrast, and patient radiation exposure (DAP).

### ***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.

### ***Materials Needed***

- 14 x 17 FPD IR
- Hand phantom
- Set of lead numbers

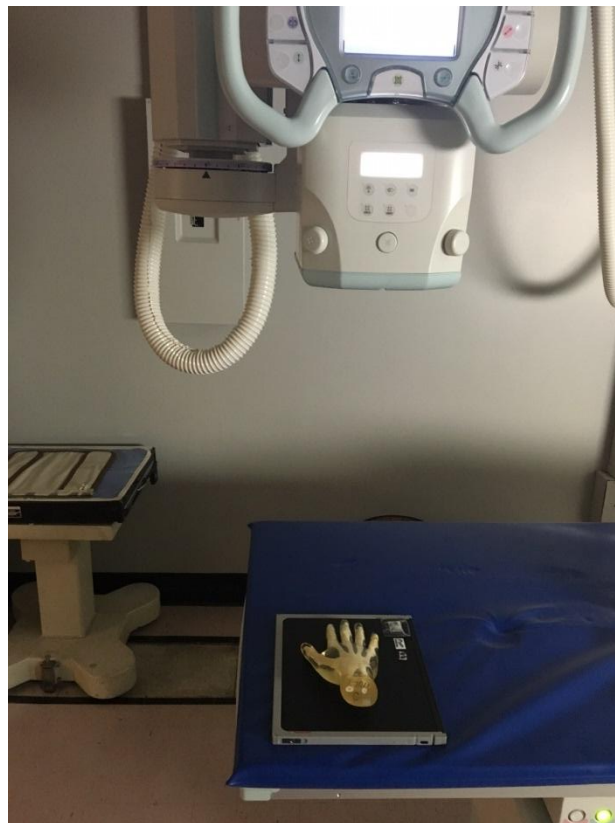


**The wireless digital (FPD) image receptor can only be handled by an instructor!**

## **Procedure**

### ***Instructions for Exposures 1 through 8***

1. When adding images to your new exam, use the system diagnostic menu.
2. Use the Direct 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**.
7. In the worksheet write EI, DI, and DAP numbers.



# Worksheet 1 15% Effect

DR

	kVp	Focal Spot	SID	mAs	mode	DAP	EI TEI DI
<b>1</b>	<b>55</b>	small	40"	<b>1.2</b>	manual		
<b>2</b>	<b>64</b>	small	40"	<b>1.2</b>	manual		
<b>3</b>	<b>74</b>	small	40"	<b>1.2</b>	manual		
<b>4</b>	<b>85</b>	small	40"	<b>1.2</b>	manual		

# Worksheet 2 15% Law

DR

	kVp	Focal Spot	SID	mAs	mode	DAP	EI TEI DI
<b>5</b>	<b>55</b>	small	40"	<b>2.4</b>	manual		
<b>6</b>	<b>64</b>	small	40"	<b>1.2</b>	manual		
<b>7</b>	<b>74</b>	small	40"	<b>0.6</b>	manual		
<b>8</b>	<b>47</b>	small	40"	<b>5</b>	manual		

# Worksheet

EI DI TEI	Compare EI, DI, and DAP of images 1 through 4 and images 5 through 8. Was there any difference in contrast between images?
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<b>1 through 4</b>		
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<b>5 through 8</b>		
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