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# **Analyzing the Mysteries of Digital Radiography (2-3 Hrs)**

## **Abstract**

Through the advent of digital radiography, there is a new imaging paradigm that must be dealt with. With digital systems, the relationships between exposure and image appearance that were the foundation in the screen/film world have drastically changed. This feature of digital radiography is due to some extremely powerful initial processing. If all processing works properly, the image will display accurate brightness levels but there may be many other problems that are not easily seen. I will show proven methods for educators and radiographers to demonstrate that their images are of the highest quality while at the same time using the least amount of radiation possible. Because of the unrestrained mAs Dose Creep problem, "How Low Can You Go" needs to be the new mantra along with ALARA. I will also talk about what needs to be done with both CR & DR equipment so that the new techniques use the 15% Rule over those used with film/screen. Furthermore, there will be discussion about the latest information concerning quality control for both CR and DR.

I will continue with discussion concerning the possible changes that can be made to the Exposure Index (EI) ranges. If this is allowed by the radiologists, new technique charts and AEC set-ups will need to occur. Since dropping the radiation dose is one of the major topics, I will show proof of how dose and mAs directly correlate with each other, and by dropping the mAs you can always drop the radiation dose. There are plenty of radiology practices going on that have, or will soon have, legal implications. There will be dialogue pertaining to marking and annotating, post processing collimation and changing processing algorithms.

## **Outline**

### **I. 15% Rule**

- A. Preliminary changes needed
- B. What is the new Optimum kVp?
- C. "As Low As You Can Go"

### **II. Image Critique**

- A. Monitors
- B. Using the Exposure Index numbers properly, histograms, magnification modes

### **III. Terms and Definitions**

- A. Which are the most important to the techs and students?

### **IV. Quality Control**

- A. What tests are needed?
- B. What equipment is necessary?

**V. Dose Exposure Indexes**

- D. Radiologist's letting staff drop the dose
- E. "Acceptable mottle"
- F. How to find these images

**VI. New Technique Charts**

- C. The math needed to make your own chart
- D. Resetting your AEC's
- E. How dose and Mas directly correlate

**VII. Legal Implications**

- B. Marking and annotation
- C. Post Processing collimation
- D. Processing algorithms

## **Objectives**

1. Identify the most important terms, definitions and abbreviations commonly used with digital radiography.
2. Describe the limitations of image processing as it relates to optimal image quality.
3. Select appropriate technical factors to optimize image acquisition, consistent with ALARA.
4. Discuss quality control set-up for CR and DR equipment.
5. Describe the possible new EI indexes.
6. Discuss the concept of acceptable mottle.
7. Identify what kind of math is needed to make or change a technique chart.
8. Explain the legal implications of not marking images, post processing collimation and changing algorithms.