
This presentation will briefly cover image detector exposure indices in digital radiography. The best way to understand what these indices tell us about image quality is to understand how they are related to image noise in digital radiography and the appropriateness of the technique factors used to make an exposure and create an image. The phenomenon of “Exposure creep” will be reviewed and an update will be provided on the AAPM’s and the International Electrotechnical Commission’s efforts to improve the tools available to cope with it.

Educational Objectives:

1. Understand how over- and under- exposures are manifested in digital radiography.
2. Recognize the advantages and disadvantages of wide exposure latitude in digital radiography and how it may impact patient dose.
3. Be able to explain the root cause of “exposure creep” and identify clinical methods to reduce it.
4. Understand current detector exposure indices in use today, how they are related to image quality, and how they are defined by various manufacturers.
5. Recognize the problem caused by having multiple index definitions in clinical use.
6. Be familiar with the exposure indices being proposed by the AAPM (TG116) and the IEC (WG43).
7. Understand why it is important to allow the exposure index to change with corrections applied to an incorrectly identified VOI by the technologist after the image is acquired.
8. Be familiar with the concept of a “Relative” exposure index or “Deviation Index”.
9. Understand the importance of maintaining exposure index logs and tracking them over time.
10. Understand the importance of establishing clear rules for repeats for the technologists and what the AAPM (TG116) will recommend for them.

Radiation Doses in DR: Part 2 - Towards Optimizing CR/DR Techniques

Unlike their film/screen forerunners, CR/DR systems provide radiology with the potential of optimizing receptor exposures—and therefore patient exposures—on an exam-specific basis. A necessary step towards this goal is assessing and monitoring receptor exposure levels currently being used. Issues associated with this task, including the current lack CR/DR exposure index standards, imprecise and/or incorrect CR/DR calibration by service personnel will be reviewed. Practical problems encountered in measuring and comparing receptor exposures among different systems will be discussed, along with suggestions for medical physicists working this area.

Educational Objectives

Upon completion of this presentation, the attendee will:
1. Understand that optimum doses for CR and DR may be customized to specific examinations and clinical operations.

2. Understand the importance of monitoring current practice to the development of optimum radiographic techniques.

3. Understand the importance of exposure indices in stabilizing clinical techniques.

4. Recognize some problems encountered in current clinical practice.

5. Understand some of the issues related to measuring and comparing receptor exposures on different systems.

6. Understand some ideas being developed to optimize CR/DR techniques.