

Digital Projection X-ray Detectors: A review of current technology and commercial landscape.

In the last decade there has been an explosion in the number of digital projection x-ray acquisition systems available in the marketplace. There has been an accompanying explosion in the terminology describing the different x-ray detector technologies used in the different commercial systems. Various companies use similar nomenclature to describe systems that incorporate markedly different detector technologies, while others use different terminology to describe essentially the same technology. This has resulted in considerable confusion in the clinical community as to the differentiating features of different commercially available systems.

This lecture will review the most common digital projection x-ray detector technologies with a particular focus on identifying the differentiating aspects of their design and capabilities. Particular attention will be paid to the similarities and differences in the detector's fundamental imaging components with a view to explaining the range of imaging capabilities of the different approaches.

The second half of the presentation will focus on the clinical implementation of the different detector technologies. A broad review of the currently available clinical systems will be given and the connection between system capabilities and detector design will be discussed. The issue of detector "speed" in a digital environment will be addressed in the context of the new IEC exposure index currently being implemented by system manufacturers. The talk will conclude with a discussion of the new wireless digital detectors currently being introduced into the clinical workplace.

Learning Objectives:

- (1) Identify and understand the differentiating features of different digital projection x-ray detector technologies
- (2) Understand the impact of detector design on system imaging performance
- (3) Understand the clinical limitations and advantages inherent to the different detector designs
- (4) Review the current commercial system landscape in terms of the different detector technologies