

AbstractID: 11965 Title: Quality Assurance for Digital Radiography

Diagnostic medical physicists have traditionally played a key role in the radiology department's Quality Assurance (QA) program. Procedures for QA of digital radiography (DR) systems are less well-established than those designed for conventional screen-film radiography. Some methods that were appropriate for conventional systems do not yield accurate results for digital systems. Methods that rely on images on film cannot be performed in a facility devoid of chemical processing. Methods that do not consider effects of all stages of the digital imaging chain from acquisition to display are likely to provide erroneous results. Digital systems often do not provide data in a convenient form for assessing performance. Nevertheless, medical physicists are responsible for designing and directing efforts to assure the safety and efficacy of DR.

Development of standards for performance verification of digital radiographic systems has been outpaced by commercialization of the technology. Practitioners, operators, vendors, and medical physicists are uncertain as to how to configure, calibrate, and verify systems for the best diagnostic quality images at the lowest practical radiation exposure to the patient. Several manufacturers have fielded commercial systems for performance verification, but long term data indicating trends and action limits is rare. Sources of definitive information on practical clinical methods are also scarce in the scientific literature. This has led to the current situation where clinical imaging operations are routinely conducted using systems that are not optimized.

The good news is that methods in common practice for conventional radiography can be applied with modification to digital radiography. Some of these methods are described in recent literature. The AAPM has recognized the dilemma and has initiated an effort to provide practical guidance to clinical physicists, i.e. Task Group 150.

This lecture will discuss some components of a QA program for DR, including adaptation of conventional QA processes. The lecture will discuss methods of evaluating system performance and provide examples of potential interferences. The lecture will review commercial devices for performance evaluation and their limitations. Finally, some ongoing standardization efforts will be described.

Educational Objectives:

1. Review components of a QA program and show how they apply to DR.
2. Understand how some conventional tests should be modified for a digital radiographic system integrated into an electronic image management system.
3. Identify key references and standards that can be useful in QA of DR.