

AbstractID:9576 Title :Quality Assurance Testing for a Clinical Digital Radiography System

**Purpose:** To develop a series of tests that can be readily performed on a clinical digital-radiography (DR) system to assess the quality of the PACS -archived image.

**Materials and Methods:** The quality of the final, processed and archived images from a digital radiography (DR) system was assessed using several measurements. These measurements included evaluation of the intra-image characteristic (or sensitometric) curve of the system using an exposure-calibrated aluminum step-wedge and its variability with mAs or "exposure index"; measurement of the relative noise in the image as a function of exposure under the steps; and determination of the square-wave-response function (SWRF) from an bar-pattern image. Test-object images were obtained using an indirect flat-panel system, saved on the hospital PACS, and evaluated offline, using image processing software.

**Results:** The DR system provided non-linear (s-shaped) curves of pixel gray-level versus step exposure; however, the curve shape derived from the calibrated step-wedge was invariant of exposure mAs. Relative image noise decreased almost linearly with log exposure under the steps and decreased with increasing mAs, as expected. The SWRF provided a means to quantify the resolution, as a function of spatial frequency of the archived image.

**Conclusion:** The methods described here provide a straightforward approach for testing the performance of the total DR system by evaluating the final archived image. These measurements provide an evaluation of the basic parameters that define the image quality and may be used as a means of quality assurance.