

## **Comparative Investigation of Image Quality Between Screen-Film and Digital Mammography**

**Purpose:** To test the hypothesis that a prototype digital mammography unit produces better quality images than conventional screen-film mammograms for equivalent exposures.

**Methods:** The prototype mammography unit tested was a full-field, flat-panel x-ray detector based on a CsI phosphor screen and an amorphous silicon detector array. Image quality for various exposure techniques were characterized through an observer study using a contrast-detail phantom. The CD-phantom consisted of 8 rows of disks of decreasing size, and 9 columns with different contrasts. For each contrast level, the observer identified the minimum detectable disk size. The observers viewed images of a CD-phantom taken at 31 different techniques - Mo/Mo 26kVp, Mo/Rh 28kVp, Rh/Rh 30kVp at mAs stations ranging from 4mAs to 600mAs.

**Results:** For the 31 different techniques, the observers were able to identify more disks in the digital images over 90% of the time. An impressive result advocating the advantage of digital mammography was for extreme over-exposed and under-exposed films. In these cases, there were no disks visible on films, but approximately half the disks were visible on the digital images.

**Conclusions:** Digital imaging produces images of superior quality than screen-film mammography for a wide variety of exposure conditions.

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