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Diagnostic utility evaluation of a aSi:H/CsI(Tl) flat-panel based digital radiography system

*Rationale and objectives:* The aim of this work is to quantitatively evaluate the diagnostic utility of our digital radiography system based on a aSi:H/CsI(Tl) flat-panel.

*Materials and Methods:* Two commercially available amorphous silicon flat-panel imaging systems are tested together using a chest phantom. This phantom contains the low contrast objects in the lung, heart and subdiaphragm regions, and the spatial resolution pattern in the lung region. Digital chest phantom images are acquired under the same environment, e.g., exposure condition, a focal spot, and a source-to-image receptor distance and a stationary antiscatter grid. All images are post-processed by each image processing unit. *Results:* The signal-to-noise ratio(SNR) of the nine low contrast objects in three chest regions and the spatial resolution are analyzed. No significant difference is showed in three different image processing units based on the same detector.

*Conclusions:* The resulting SNRs are in the range of Rose Model for human observers to detect a contrast object signal. Finally, the simple procedure employed in this work eliminates observer subjectivity and can be applied for the detectability measurement of low contrast objects in other digital diagnostic modalities.