

AbstractID: 1768 Title: How robust are image quality indices obtained from clinical CT images?

Purpose: To investigate the robustness of contrast (mean HU value) and noise (standard deviation) in chest CT images.

Method: Two readers analyzed 100 chest CT images acquired during a lung cancer screening study. Three sections of the CT examination were selected for analysis (carina, diaphragm, and abdomen). Measurements were made of the AP dimension, as well as the mean HU value and standard deviation in selected tissues. Areas for making these HU measurements included the descending aorta (one in each of three sections), liver (diaphragm and abdomen), renal cortex and spleen. The level of agreement between the measurements for each parameter made by two observers was quantified using the coefficient of determination (r^2).

Results: Excellent agreement between the two readers was obtained for the AP dimensions, with an average r^2 of 0.97. For the mean HU value, good agreement was found for the liver in the diaphragm ($r^2 = 0.54$) and abdomen ($r^2 = 0.75$). However, the average r^2 value in the remaining five regions was only 0.08. The average r^2 value for noise measurements in the seven tissues investigated was 0.84 ± 0.05 , with the highest value in the abdominal liver ($r^2 = 0.92$).

Conclusions: The liver was the *only* tissue that resulted in robust values of image contrast and noise in body CT examinations.