AbstractID: 5365 Title: Lung Cancer Screening Performance of Chest CT Images using Frequency of Radiologists' Location Identifications

The radiology exam reports and the computer-aided detection (CAD) findings on 26 low-dose CT, lung-cancer screening exams were compared to the findings of a reference database. The reference database was developed using 6 radiologists localizations of image features of concern. The radiologists were instructed to use a lax criterion for the identification of compact features that could be further evaluated for lung cancer. An unsupervised computer procedure using the distances between report locations determined which localizations were associated with the same image feature.

The reference database consisted of 609 findings of locations and their identification frequency. Forty two percent (257) of the reference database findings had a frequency of 2 or greater; these were considered positive finding using a lenient standard. The radiologist exam report identified 22% of the lenient standard findings, while the CAD system identified 16%. The database contained 50 findings (8%) using a stringent standard that the finding had to be reported on 5 or 6 occasions. The radiologist exam report identified 50% of the stringent standard findings, while the CAD system identified 40%. The radiology exam report had 6 findings not in the reference database.

Low dose CT, lung cancer screening exams contain numerous features of concern that could be further evaluated for lung cancer. The radiologist exam report missed 50% to 80% of these image features. The CAD system is unlikely improve the radiologists detection performance because it identified even fewer features of concern.

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