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Radiologist performance in the detection of lung cancer using computed tomography

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Background: Lung cancer, the leading cause of cancer death worldwide, can be survived if early detection through screening programs occurs. Radiologist performance plays a pivotal role in lung cancer detection.

Purpose: To measure the level of radiologists' performance in lung cancer detection. We also explore radiologists' performance in cancer specialized and nonspecialized centers.

Methodology: Thirty radiologists read sixty chest computed tomography (CT) scans. Thirty cases had surgically or biopsy-proven lung cancer and thirty were cancer-free cases. The cancer cases were validated by four expert radiologists who located the malignant lung nodules. Reader performance was evaluated by calculating sensitivity, location sensitivity, specificity, and area under the receiver operating characteristic curve (AUC). In addition, sensitivity at fixed specificity = 0.794 was computed from each reader's estimated receiver operating characteristic curve.

Results: The radiologists had a mean sensitivity of 0.749, sensitivity at fixed specificity of 0.744, location sensitivity of 0.666, specificity of 0.81 and AUC of 0.846. Radiologists in the specialized and nonspecialized cancer centers had the following (specialized, nonspecialized) pairs of values: sensitivity = (0.80, 0.719); sensitivity for fixed 0.794 specificity = (0.752, 0.740); location sensitivity = (0.712, 0.637); specificity = (0.794, 0.82) and AUC = (0.846, 0.846).

Conclusion: The efficacy of radiologists in our study was comparable to other studies. Furthermore, AUC outcomes were similar for specialized and nonspecialized cancer center radiologists, suggesting they have similar discriminatory ability and that the higher sensitivity and lower specificity for specialized-center radiologists can be attributed to them being less conservative in interpreting case images.

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