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Lung cancer being one of the leading causes of death worldwide, with current survival rate of only 16%. It’s not difficult to imagine how much of a positive effect early tumor detection can have on the lives of people. CT scans and with the recent advancement in multi-slice CT scan, detection of lung cancer at an early stage has become possible but it is still very hard to distinguish between benign and malignant tumors. Researchers are working on CAD (Computer Aided Diagnosis) which involves determining features of nodules and classification techniques to distinguish between benign and malignant tumors. Due to the complexity of the diagnostic task, there is no well accepted guide for model selection. This paper analyzes ANN and LR model and their differences when it comes to detection.

The database analyzed in this study included 135 malignant and 65 benign nodules. In this study, an LR model with seven independent variables with seven selected features was developed with classification threshold set to 0.5 and a three layer feed forward ANN with a 12-5-1 nodal architecture was constructed, the performance of the two models analyzed.

In this study three aspects of model performance was considered including calibration (prediction accuracy over an entire range), clinical usefulness and discrimination (accuracy when distinguishing between outcomes, in this case benign and malignant). For an unbiased analysis there was insufficient data for training and testing as we need dataset that was not used for modeling. Therefore bootstrap resampling approach was used. ANNs had higher discriminative performance than LR model. In addition to that the overall accuracy rate was also higher for ANN’s. This study reveals that ANN’s outperformed LR models in discrimination and clinical usefulness but did not outperform in calibration.