## EVALUATION OF MULTI-READER PERMUTATION PROCEDURES TO COMPARE THE AREAS UNDER TWO ROC CURVES

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We present a permutation test to compare the areas under two ROC curves when diagnostic assessment is made on a set of cases by multiple readers. The statistical test is developed for the situation where each reader provides a diagnostic score for each case for two different imaging systems. A strength of the permutation test is that it can accommodate a variety of summary statistics. We compare the operating characteristics of statistical tests based on different summary statistics including nonparametric estimates of area using the trapezoidal method, maximum likelihood estimates of area based on the binormal distribution, and estimates based on transformation functions. Simulations are presented for both binormal data and data obtainmed from empirical distributions similar to real life data bases. For some summary statistics asymptotic tests are developed and included in the comparisons. For small samples the permutation approach are provided using data from studies comparing the diagnostic accuracy of different radiological imaging systems.