



CCD versus Laser:

A Comparative Study of Two Types of X-Ray Film Digitizers

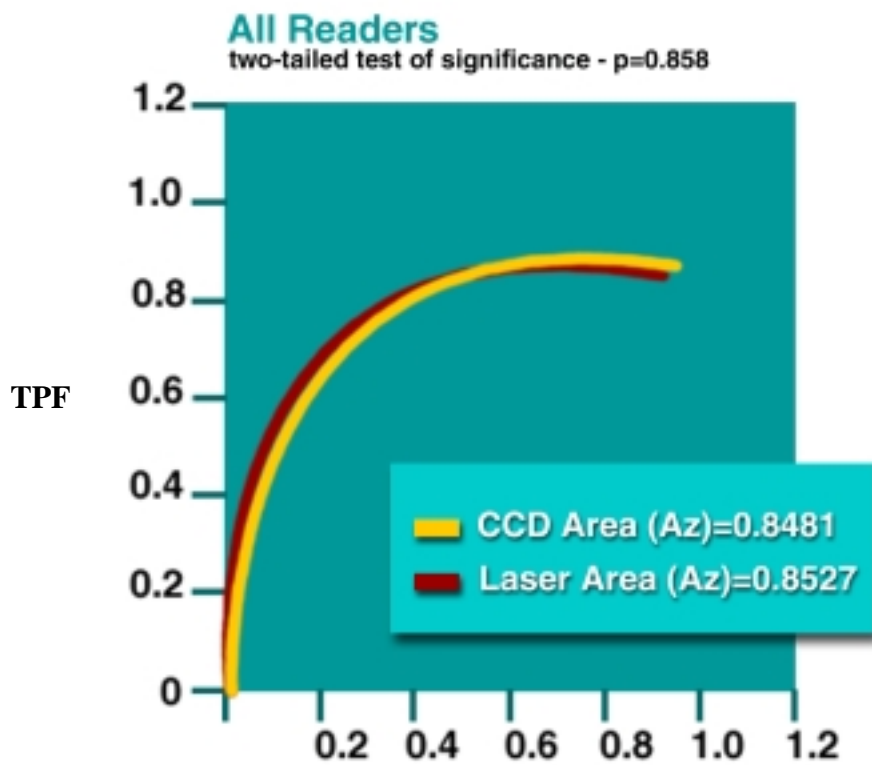
PURPOSE: To determine if there are differences between the accuracy of interpretations of radiographic images resulting from digitizing films using a charge coupled device (CCD) and laser film digitizer to obtain data on perceived image quality related to the two types of digitizers. The general hypothesis tested was that there are no significant differences in measures of accuracy, sensitivity, specificity, and receiver operator characteristics (ROC) analysis between radiographic film examinations digitized on CCD and laser equipment.

MATERIALS AND METHODS: Several authors selected 120 radiographic examinations from the departmental film files, which included 38 chest cases, 20 abdominal, 33 extremity, and 29 other types of procedures. Among these examinations there were 59 designated as “abnormal” and 61 “normal” cases. The selected abnormalities were clinically important while the “normal” cases did not indicate any of these abnormalities. All of the examinations had a high degree of diagnostic difficulty. The analog radiographs were digitized on both CCD and laser equipment. Eight board-certified radiologists participated in the study by interpreting half of the examinations from each of the two types of digitizers being compared. No radiologist read the same examination more than once.

RESULTS: There were no significant differences observed in the accuracy of interpretations when the data between the two types of digitizers were compared. Differences noted in perceived image quality among readers were not significant. The results of the ROC analysis, which include all of the diagnostic interpretations of the readers, were also not significant.

CONCLUSIONS: Since no significant differences in the accuracy of interpretations of high resolution soft-copy readings were noted in the study, one may conclude that for these types of radiographic examinations digitized on the specific CCD and laser equipment used, healthcare providers may rely equally on the interpretations produced from either type of digitizer. The complete results of this study will be published soon in a peer-reviewed journal.

**ROC Analysis of the Accuracy of Radiographic Interpretations
for Two Types of Digitizers**



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FPF

Y Axis = True Positive Fraction (TPF)
X Axis = False Positive Fraction (FPF)