

# Improved Cancer Detection Using Computer-Aided Detection with Diagnostic and Screening Mammography: Prospective Study of 104 Cancers

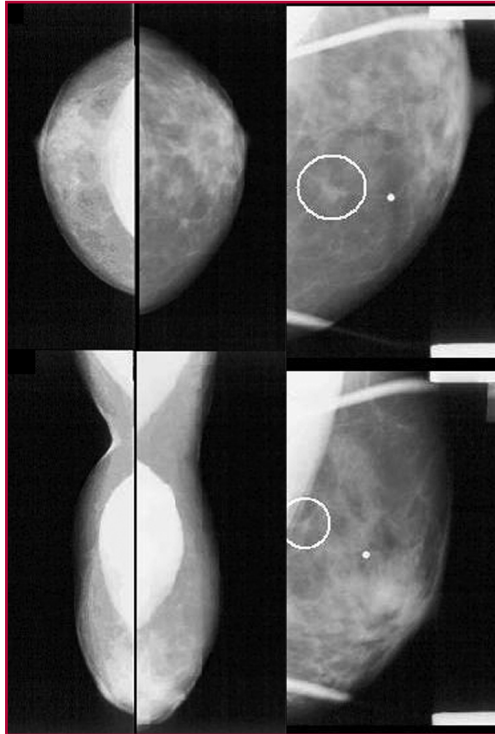
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## **Objective**

This study prospectively evaluated a computer-aided detection (CAD) device used with diagnostic and screening mammography by assessing cancers detected; tumor sizes, histology, and stage; positive predictive value (PPV) of biopsy recommendation; and recall rates before and after CAD introduction.

## **Subjects and Methods**

Interpretations of 9,520 consecutive mammograms were recorded without and then with CAD for a 28-month period. Cancer detections based on initial radiologist review and additional detections based on CAD findings were noted. Recall rates, tumor size and histology, and PPV of biopsy recommendation before and after the introduction of CAD were compared.



Implant displacement and magnification views showing 4.5mm invasive ductal carcinoma (circled) in 60 year old woman detected by computer-aided detection (CAD) device. Marker was placed over corresponding lesion seen on sonography before magification mammography.

## Results

Cancers detected only with CAD assistance were 9.6% of all cancers (10 of 104); screening-detected cancers increased 13.3% with CAD assistance (four in addition to 30 screening-detected cancers). The 95% one-sided confidence boundary using binomial distribution is consistent with at least 5.3% for all cancers and 5.1% for nonpalpable cancers. The greatest impact was on ductal carcinoma in situ, for which CAD increased cancer detection by 14.2% (three added to 21). Similar percentages of cancers were detected only with CAD assistance in both screening (11.4%; 4 of 35) and diagnostic (9.5%; six of 63) studies. Additional cancers were detected using CAD in patients with implants and previous lumpectomy. The additional cancers detected with CAD were smaller ( $p = 0.01$  for all cancers,  $p = 0.03$  for nonpalpable invasive cancer). The screening recall rate increased from 6.2% to 7.8% after CAD, with a decrease in the biopsy rate and a nonsignificant increase in the biopsy PPV from 21.9% to 26.3%.

## Conclusion

CAD resulted in detection of more cancers in screening and diagnostic patients, with an increased recall rate but no deterioration in PPV of biopsy. Additional cancers detected were significantly smaller.

*Dean, Judy C., Ilvento, Christina C. Improved Cancer Detection Using Computer-Aided Detection with Diagnostic and Screening Mammography" Prospective Study of 104 Cancers. AJR 2006; 187:20-28.*

iCAD is 100% focused on computer-aided detection. 100% committed to advancing the technology. 100% dedicated to earlier detection of hard-to-find cancers, more efficient workflow, and higher quality patient care.



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