**Screening Breast Ultrasound as a Supplement to Mammography: Yield of Annual Screening in ACRIN* 6666 *American College of Radiology Imaging Network with support from The Avon Foundation and National Cancer Institute (CA079778, CA80098)**

*WA Berg, Z Zhang, J Cormack, DE Lehrer, M Bohm-Velez, ED Pisano, RA Jong, WP Evans, M Morton, M Mahoney, LH Larsen, RG Barr, D Farria, EB Mendelson, H Marques, A Adams, G Gabrielli*

## PURPOSE

To compare the cancer detection rate (yield) of combined mammography plus ultrasound to mammography alone in incidence screens of ACRIN 6666.

## METHOD AND MATERIALS

2809 women at elevated risk for breast cancer with nonfatty breasts were recruited from 4/04 to 2/06 from 21 IRB-approved sites to undergo mammography (M) or physician-performed ultrasound (US) exams, randomized in order, masked, and interpreted by different physicians prior to integrated interpretation, with screening at time 0 (year 1), 12 (year 2), and 24 months (year 3). Reference standard is based on biopsy and/or 12-month follow-up for each screen. Results from screens in years 2 and 3 were compared to those in year 1.

## RESULTS

2648 eligible women had reference standard for the first screen [mean age 55.2 yr, range 25-91], and were at elevated risk due to: personal history of breast cancer (53%); familial high-risk by Gail or Claus models (43%); prior ADH/ALH/LCIS/atypical papilloma (3%); BRCA-1 or -2 mutation (1%).

In year 1, of 2648 screened, cancer was found in 36 (1.4%) women: 8 on both M and US; 12 M alone; 12 US alone; 4 neither. In year 2, of 2487 screened, 28 (1.1%) had cancer: 7 on both M and US; 6 on M alone; 9 on US alone; 6 neither. In year 3, of 1921 screened, 46 (2.4%) had cancer: 7 on M and US; 14 on M alone; 9 on US alone; 16 neither (with 8 seen only on MRI).

Supplemental yield of US was 4.2/1000 in year 1 (95% CI 1.1 to 7.2); 4.0/1000 in year 2 (95% CI 1.1 to 6.9); and 4.7/1000 in year 3 (95% CI 0.8 to 8.6). 110 participants were diagnosed with cancer, including 23 (21%) DCIS and 87 invasive, with 12/66 (18%) node positive among those staged. Of participants with cancer seen only on US, 28/30 (93%) were invasive, with median size of 10 mm (range 2 to 40), and 1/24 (4.2%) was node positive among those staged. Of 26 participants with cancer not depicted by M or US, only 8 presented clinically in the interval between screens, for an interval cancer rate of 7.3%. There was no difference in supplemental yield of US among the 41.3% of exams performed with digital vs. film-screen mammography.

## CONCLUSION

The supplemental yield of screening US after mammography is constant, averaging 4.3 per 1000 annual screens [95% CI 2.7 to 6.0] among women at elevated risk of breast cancer.

## CLINICAL RELEVANCE/APPLICATION

Detection of mammographically-occult node-negative invasive breast cancer is improved by supplemental annual screening with US.