Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Fenton JJ, Taplin SH, Carney PA, et al. Influence of computer-aided detection on performance of screening mammography. N Engl J Med 2007;356:1399-409.

APPENDIX

Estimation of Numbers Needed to Screen, Recall, and Biopsy

We first assumed from unadjusted analyses that CAD use increases sensitivity by 3.6%, the recall rate by 3.1%, and the biopsy rate by 2.9 per 1000 screens (Table 4). From study data (Table 1), we estimated the prevalence of breast cancer to be 0.55% (5.5 cases per 1000 women). We then calculated the incremental (absolute) increase in cancer detection with CAD use as 0.198 per 1000 screens (3.6%*0.55%=0.000198). Thus, 5,050 women (1/0.000198) would have to be screened at facilities using CAD to detect one additional cancer. Among these 5,050 women, ~157 women would be recalled (3.1% of 5,050) and ~15 women would undergo biopsy because of CAD (5,050*2.9 biopsies/1000 screens). Thus, to detect one additional cancer (including invasive cancers and ductal carcinomas in-situ), CAD would generate approximately 157 recalls and 15 biopsies.

Estimation of Nationwide Costs of Computer-Aided Detection Use

Approximately 31 million screening mammograms are performed annually in the U.S.[1] We estimated the differential costs of performing these mammograms with and without CAD.

From unadjusted analyses (Table 4), we assumed that the recall rate increases from 10.1% to 13.2% with CAD use. We used inflation-adjusted cost estimates for screening mammography ($143 per mammogram)[2] and diagnostic evaluation after recall ($458 per recall)[3] and assumed the supplemental fee for CAD application is $20.[4] We then calculated the costs of annual mammography screening (including initial screening and diagnostic evaluation after recall) with and without CAD application. Under these assumptions, nationwide CAD use would increase the annual costs of screening mammography by ~$550 million (~18% increase in the annual direct costs for screening mammography).

Appendix References

1. Nass S, Ball J, eds. Institute of Medicine and National Research Council. *Improving breast imaging quality standards*. Washington, DC: National Academies Press; 2005.

2. Brown ML, Fintor L. U.S. screening mammography services with mobile units: results from the National Survey of Mammography Facilities. *Radiology.* 1995;195:529-532.

3. Kerlikowske K, Salzmann P, Phillips KA, Cauley JA, Cummings SR. Continuing screening mammography in women aged 70 to 79 years: impact on life expectancy and cost-effectiveness. *JAMA.* 1999;282:2156-2163.

4. R2, Inc. The Centers for Medicare and Medicaid Services (CMS) Increase Reimbursement for Computer Aided Detection (CAD) Technology. http://www.r2tech.com/main/company/news_one_up.php?prID=81&offset=0&year_search=2001. Accessed June 29, 2005.