

## Counseling Women About Mammography: Benefits vs. Harms

MICHAEL B. POTTER, MD, *University of California, San Francisco, School of Medicine, San Francisco, California*

The Cochrane Abstract on the next page is a summary of a review from the Cochrane Library. It is accompanied by an interpretation that will help clinicians put evidence into practice. Dr. Potter presents a clinical scenario and question based on the Cochrane Abstract, followed by an evidence-based answer and a critique of the review. The practice recommendations in this activity are available at <http://www.cochrane.org/reviews/en/ab001877.html>.



This clinical content conforms to AAFP criteria for evidence-based continuing medical education (EB CME). See Clinical Quiz on page 629.

The series coordinator for AAFP is Clarissa Kripke, MD, Department of Family and Community Medicine, University of California, San Francisco.

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### Clinical Scenario

A healthy 44-year-old woman with no family history of breast cancer has never had a mammogram. Her best friend was recently diagnosed with breast cancer.

### Clinical Question

How should physicians counsel women about mammography?

### Evidence-Based Answer

Studies of mammography show a 0.1 percent absolute reduction in breast cancer mortality with mammography. This means that if 2,000 women are offered mammography over 10 years, one woman would have her life prolonged, 10 healthy women would be treated unnecessarily for breast cancer, and about 200 women would undergo psychological distress and additional testing because of false-positive results. Women should be informed of the potential benefits and harms of mammography before undergoing the screening test at any age.<sup>1</sup>

### Practice Pointers

This Cochrane review updates a controversial 2001 review that concluded that mammography at any age is unjustified. This updated review concludes that the large randomized trials of mammography conducted in the past 40 years indicate that mammography can reduce breast cancer mortality by 15 to 20 percent. However, the authors remain skeptical about the balance of benefits and harms from mammography at any age. False-positive mammography results are much more common than true positives, and there is a potential for the overdiagnosis of nonaggressive or more-advanced, but indolent, forms of ductal carcinoma in situ (DCIS).

Most authorities who have weighed the same evidence included in this Cochrane review have endorsed mammography screening every one or two years for women 40 years and older.<sup>2,3</sup> They acknowledged that women 40 to 49 years of age have less to gain from screening than women 50 to 69 years of age, and that women 70 years and older are likely to benefit only if they are healthy.<sup>2,3</sup> Studies of U.S. women have generally found a high tolerance of false-positive results, but the extent and consequences of overdiagnosis continue to be a source of debate.<sup>4,5</sup> One recent and carefully designed study found an overdiagnosis rate of only 10 percent, which is significant but substantially less than that estimated in this Cochrane review.<sup>6</sup>

Given the uncertainties, clinicians should be prepared to counsel average-risk patients who are considering mammography about the facts related to breast cancer and screening. Breast cancer is the second leading cause of cancer death in the United States, with approximately 40,000 deaths predicted in 2007.<sup>7</sup> As the incidence of early-stage DCIS has increased, the incidence of invasive breast cancer has decreased. Overall, the rate of breast cancer mortality in the United States decreased by 2.3 percent annually between 1990 and 2002. This decline in the mortality rate may be caused in part by more screening, better treatment, and other factors.<sup>8</sup>

The Centers for Disease Control and Prevention estimates that a woman's chance of dying from breast cancer when she is 40 to 49 years of age is 0.2 percent (one in 500); this increases to 0.4 percent (one in 250) for a woman 50 to 59 years of age and to 0.7 percent (one in 140) for a woman 60 to 69 years of age.<sup>9</sup> In 2002, the U.S. Preventive Services Task Force estimated that 1,792 women 40 to

## Cochrane Abstract

**Background:** A variety of estimates of the benefits and harms of mammographic screening for breast cancer have been published, and national policies vary.

**Objectives:** To assess the effect of screening for breast cancer with mammography on mortality and morbidity.

**Search Strategy:** We searched Pubmed (June 2005).

**Selection Criteria:** Randomized trials comparing mammographic screening with no mammographic screening.

**Data Collection and Analysis:** Both authors independently extracted data. Study authors were contacted for additional information.

**Main Results:** Seven completed and eligible trials involving 500,000 women were identified. We excluded a biased trial from analysis. Two trials with adequate randomization did not show a significant reduction in breast cancer mortality (relative risk [RR] = 0.93; 95% confidence interval [CI], 0.80 to 1.09) at 13 years, and four trials with suboptimal randomization showed a significant reduction in breast cancer mortality (RR = 0.75; 95% CI, 0.67 to 0.83);  $P = .02$  for difference between the two estimates. The RR for all six trials combined was 0.80 (95% CI, 0.73 to 0.88).

The two trials with adequate randomization did not find an effect of screening on cancer mortality, including breast cancer (RR = 1.02;

95% CI, 0.95 to 1.10) after 10 years or on all-cause mortality (RR = 1.00; 95% CI, 0.96 to 1.04) after 13 years. We found that breast cancer mortality was an unreliable outcome that was biased in favor of screening, mainly because of differential misclassification of cause of death.

Numbers of lumpectomies and mastectomies were significantly greater in the screened groups, (RR = 1.31; 95% CI, 1.22 to 1.42) from the two adequately randomized trials; the use of radiotherapy was similarly increased.

**Authors' Conclusions:** Screening likely reduces breast cancer mortality. Based on all trials, the reduction is 20 percent, but because the effect is lower in the highest-quality trials, a more reasonable estimate is a 15 percent relative risk reduction. Based on the risk level of women in these trials, the absolute risk reduction was 0.05 percent. Screening also leads to overdiagnosis and overtreatment, with an estimated 30 percent increase, or an absolute risk increase of 0.5 percent. This means that for every 2,000 women invited for screening throughout 10 years, one will have her life prolonged. In addition, 10 healthy women, who would not have been diagnosed if not screened, will be diagnosed with breast cancer and will be treated unnecessarily. Thus, it is not clear whether screening does more good than harm. Women invited to screening should be fully informed of benefits and harms.



These summaries have been derived from Cochrane reviews published in the Cochrane Database of Systematic Reviews in the Cochrane Library. Their content has, as far as possible, been checked with the authors of the original reviews, but the summaries should not be regarded as an official product of the Cochrane Collaboration; minor editing changes have been made to the text (<http://www.cochrane.org>).

49 years of age must be screened for 14 years to prevent one death, and 838 women 50 to 69 years of age must be screened for 14 years to prevent one death.<sup>2</sup> After considering this information, women who are at average risk of breast cancer may reasonably come to different personal conclusions about having a mammogram.

The National Cancer Institute has developed an online risk-assessment tool (<http://www.cancer.gov/bcrisktool>) that includes factors other than current age such as age at menarche, age at first childbirth, ethnicity, and family history. Such tools may help a patient make decisions about mammography in the context of her individual risk. Some factors that have been proven to increase the risk of breast cancer, such as extensive mammographic breast density,<sup>10</sup> are not yet included in the tool. For women with a high risk of breast cancer, more intensive interventions such as genetic counseling and breast magnetic resonance imaging may be indicated.<sup>11</sup>

Unfortunately, even with all the available facts about breast cancer screening, decisions about obtaining mammography can be complicated. A recent study found that women with abnormal mammography results and subsequent DCIS diagnoses would have preferred more information about the implications of mammography before they were originally screened.<sup>12</sup> Ultimately, before deciding whether to be screened, women should receive

a careful assessment of their personal risk of breast cancer and counseling about their individualized benefits versus harms from mammography.

Address correspondence to Michael B. Potter, MD, [potterm@fcm.ucsf.edu](mailto:potterm@fcm.ucsf.edu). Reprints are not available from the author.

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