



# Current Controversies and Changing Standards in Mammography



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**ABSTRACT:** Screening with mammography for early detection of breast cancer has been widely scrutinized since its beginning. This scrutiny continues to bring new standards to light. This article will talk about the current controversies, mainly screening in general, screening for the 40- to 49-year-old group, perceived harms of mammography, and overdiagnosis in the screened population. We will also discuss the changing standards concerning breast density. The article will conclude with adjunct breast cancer screening options. (*J Radiol Nurs* 2016;35:74-84.)

**KEYWORDS:** Screening; Mammography; Cancer.

## INTRODUCTION

Breast cancer is the second most frequently diagnosed malignancy in women, second only to skin cancer. The lifetime probability of a woman developing breast cancer is one in eight. This is about 12% of the female population. Breast cancer is the second leading cause of cancer mortality in women (Feig, 2014). A total of 231,840 women are estimated to be diagnosed with breast cancer in the United States in 2015 (Siegel et al., 2015).

Although life style changes may decrease the risk of breast cancer, there is no proved prevention option for women at normal risk. The size and stage of breast cancer at the time of diagnosis are important factors for overall survival. Mammography has been demonstrated to be the best screening method for detecting breast cancer in the early stages. The goal of screening mammography is to find a cancer before it becomes clinically evident. Multiple studies have proved that screening mammography decreases mortality from breast cancer by 15%-35% (Feig, 2014).

A screening mammogram consists of two low-dose X-ray views of each breast while the breast is compressed. One view is a craniocaudal (CC) view, and the other view is a mediolateral (MLO) view (Figure 1).

While evaluating the two views of each breast, the radiologist searches for early signs of breast cancer. Breast cancer is a heterogeneous disease that presents in various ways. Early signs of breast cancer can include calcifications, masses, asymmetries, and architectural distortion. If there is a finding on the screening study, the patient is requested to return for additional mammographic views and perhaps ultrasound.

For every 1,000 women who have a screening mammogram, about 100 (10%) women will be asked to return for additional diagnostic studies. When the patient returns for the diagnostic evaluation, additional mammogram images and perhaps ultrasound are performed. After the additional studies, 61 of 100 women recalled (6% of the original group screened) will have a negative study and will be asked to return for a screening mammogram in 1 year. Of the 100 recalled women, 20 patients (2% of the original group screened) will have a short-term follow-up recommended for a finding that is probably benign. If the additional diagnostic studies are deemed suspicious, then a biopsy is recommended. Approximately 19 of the original 1,000 women screened (1.9%) will have a minimally invasive needle biopsy, with about five biopsies yielding cancer.

Screening for breast cancer with mammography continues to be an innovative and evolving field.

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**Figure 1.** Screening study showing right and left CC (above) and RML0 (below) views of each breast.

Mammography is always under scrutiny, with a myriad of changing recommendations. As radiologists, we interact with patients and physicians daily. For this reason, we know that there are a lot of questions and confusion about mammography screening guidelines. It can be challenging for referring clinicians to be informed of all the controversies and changes. In this article, we aim to address several questions that we are often asked by our referring clinicians.

We will begin by examining the evidence for screening a population with mammography. Then, we will talk specifically about screening in the 40- to 49-year-old population. We will discuss perceived harms of mammography. We will then explain the controversy about overdiagnosis of breast cancer in the screening population. Next, we will focus on breast

density. At least 24 states have enacted Breast Density Notification Legislation. Finally, we will talk about additional screening tools available to women.

The format of this article is presented in a “Question” asked by the referring clinician and “Answer” provided by the radiologist.

**As a referring clinician, I would like to know what is the evidence for screening mammography?**

There have been a myriad of controversies surrounding screening mammography. There have been several studies showing the benefit of breast cancer screening with mammography. The Swedish Two-County Trial began in the 1970s and has had a 29-year follow-up for breast cancer mortality. A total of 133,065 women were randomized into one of two groups. One group was invited to mammographic screening, and the other group (the control group) received the usual care. The women aged 40-74 years lived in one of two Swedish counties. Women were screened for 7 years with a single-view screen-film mammogram. Women aged 40-49 years were screened every 24 months, and women aged 50-74 years were screened every 33 months. The results showed that there was a 30% reduction in mortality in the women who were screened with mammography compared with the women who were in the control group (Tabar et al., 2011).

In total, there have been eight randomized clinical trials (RCTs) looking at screening mammography. Of these, there have been seven which have showed a benefit from screening with a reduction in mortality. The Swedish two-county trial, the Malmo (Sweden) mammographic screening trial, Health Insurance Plan of Greater New York trial, the Edinburgh (Scotland) trial, the Gothenburg (Sweden) breast screening trial, the Stockholm (Sweden) trial, and the U.K. Age trial all showed a reduction in mortality. These seven studies were population-based trials (Kopans & Feig, 1993).

There was one nonpopulation-based RCT, and this was the National Breast Screening Study of Canada (NBSSC). This trial did not show a benefit to screening mammography. The NBSSC study had inherent flaws. An internal review conducted by the NBSSC’s own reference radiologist found that interval cancers (cancers between mammograms) were seen on the prior mammogram 42% of the time. The reference radiologist also found that 25% of the cancers diagnosed on the screening study were seen on the prior screening study a year before. Furthermore, the reference physicist responsible for the quality control of the mammography in the NBSSC stated, “quality [in the NBSSC] was far below state of the art, even for that time. Problems in the quality of mammography resulted not only from inadequate equipment in some cases, but also

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