

Screening Mammography and Breast Cancer Reduction: Examining the Evidence

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ABSTRACT

Better treatment and awareness may explain much of the decline in breast cancer deaths in recent years, not mammography. For women without a family history of breast cancer, the risks of screening mammography may outweigh the benefits, particularly for women younger than age 50. Mammography carries the risk of overdiagnosis of tumors that would not have caused death. Nurse practitioners are advised to educate their patients on mammography risks and benefits while increasing their emphasis on the clinical symptoms of breast cancer and ways to reduce risk, including weight control, decreased alcohol use, and decreased use of menopausal estrogen.

Keywords: breast cancer, cancer prevention, evidence-based practice, mammography, overdiagnosis, screening

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Referral for a mammogram has long been an important item on a checklist for any woman older than age 40 seeing her primary care provider. After all, using a mammogram to screen for breast cancer makes intuitive sense; catching a tumor even before it is clinically evident allows for earlier treatment and results in fewer women dying.¹ As evidence, the death rate from breast cancer has been declining.² In 1975, the death rate for breast cancer in the United States was 31.45 per 100,000, staying stable in the 30 to 32 range until 1998 when it started to drop steadily; in 2010, it reached its lowest point of 21.92 per 100,000.² An estimated 39,500 women died from breast cancer in 2012, including an estimated 4,100 in the 40- to 49-year age group.³

Some researchers have challenged these long-held assumptions about the benefits of mammograms and breast self-examinations (BSEs) for women not at high risk for the disease.⁴⁻⁶ Otis Brawley of the American Cancer Society went so far as to say that at least half of the decrease in breast cancer mortality “if not most” was because of better treatment and greater awareness of breast cancer among women and their providers, with

only 15% to 40% of the decline attributed to screening.³

A decline in the use of menopausal estrogen may also have contributed to this decrease; a nationwide drop by women in the use of hormone replacement therapy in 2002 was followed by a 8.6% decrease in the US in new cases of breast cancer in 2003.⁷ The introduction of tamoxifen may explain the 37% decline in breast cancer mortality in Sweden for women younger than 50 between 1989 and 2005 before screening had been introduced.⁸ Autier et al⁶ also found that breast cancer deaths in Sweden had been dropping even before screening was introduced.

Mammography critics have further stated that the benefits of screening for women not at high risk in terms of lives saved do not outweigh the risks in terms of false positives or, even more alarming, overdiagnosis.^{8,9} Overdiagnosis refers to a case in which a cancer that is diagnosed by screening would never have been otherwise diagnosed in the woman’s lifetime and would not have caused symptoms or death.⁹ With overdiagnosis, some cancers caught on screening may never progress and may even go away or the cancer may be so slow growing that the patient dies from another cause first⁹ (Figure 1).

The screening debate culminated in 2009 when the US Preventive Services Task Force (USPSTF) advised that mammograms not start until age 50 and be done every 2 years,¹⁰ going against the recommendations of virtually every professional society, all of which had called for annual mammograms starting at age 40.¹¹ The debate over the value of screening has not abated in the 5 years since the task force issued its guidelines. Indeed, some researchers have advised women not to get mammograms at all.¹²

To be sure, patients with a genetic mutation, such as *BRCA1* or *BRCA2*, or a history of chest radiation or an increased risk of breast cancer need to get mammograms before the age of 50.¹³ But, for everyone else, it may turn out that the best payoff in terms of optimal outcome will be in preventing breast cancer. This article addresses arguments on both sides of the controversy and provides nurse practitioners (NPs) with helpful information to guide their patients in making important decisions regarding the benefits and risks of screening. Other ways to lower their risk of dying from breast cancer besides screening mammography are also discussed.

INCIDENCE AND PREVALENCE

On January 1, 2010, the prevalence, or total number of women with breast cancer in the US, was 2.83 million, including those with active disease and those

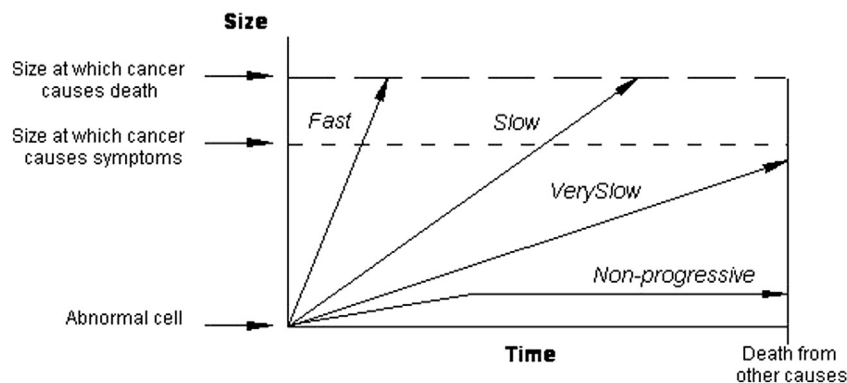
cured of the disease. A woman's lifetime risk of being diagnosed with breast cancer is 1 in 8, but the breast cancer mortality is, in fact, lower because many women will die of another disease first before they die of breast cancer.² A more useful statistic is the probability that a woman between the ages of 50 and 70 will develop breast cancer (5.59%).²

In 2013, the incidence, or number of new cases of breast cancer in the US, was estimated at 232,340 with 39,260 deaths.² Between the years 2006 and 2010, the incidence of breast cancer in the US averaged out to 123.8 per 100,000 women per year.²

Figure 2 shows the incidence and deaths from breast cancer per 100,000 women by racial and ethnic group. The incidence was highest for white women, followed by black women, Asian/Pacific Islander women, Hispanic women, and American Indian/Alaska Native. Death rates, however, were the highest for black women, followed by white, American Indian/Alaskan Native, Hispanic, and Asian/Pacific Islander women.

Between 2006 and 2010, the median age of death for breast cancer was 68 years old. Figure 3 shows the incidence and deaths from breast cancer by age as a percentage of total women. The incidence and death rate were highest between the ages of 55 and 64, with 25.2% of all women diagnosed with breast cancer in that age group and 21.6% of the deaths in

Figure 1. Different types of cancer progression.



The *Fast* arrow represents a cancer that quickly results in clinical symptoms and death. The *Slow* arrow represents a cancer that is slow growing and takes many years to manifest clinically. The *Very Slow* arrow represents a cancer that is so slow growing that the patient will die of another disease before breast cancer. The *Non-progressive* arrow represents either a cancer that actually regresses or a cancer that will never cause clinical symptoms although it meets the pathological criteria for a cancer diagnosis on screening.

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