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Benefits of mammography are explained by biology, not dogma

"My daughter just had a mammogram and they found a tumor. You can't tell me her life was not saved. Should we just have waited until it grew and was twice the size the next year?"

When a cancer is found on screening, the assumption is that if any more time elapsed between the time of screening and the time it became clinically apparent, a woman's life would be lost.

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There is, however, very little evidence to support what seems emotionally to be true. In fact, the reason screening every 1 to 2 years is of value is because tumors grow slowly enough for periodic screening to be of value.

Screening has been shown to be of value in tumor types that are slow growing, such as cervical cancer and colon cancer. The recommended screening intervals now are every 3 years for Pap smears and every 10 years for colonoscopy.

The randomized trials demonstrate there is a relative risk reduction from screening.

However, as **H. Gilbert Welch, MD,** pointed out in a recent *Archives of Internal Medicine* article, this translates into a reduction in mortality that is very small in absolute terms. By no means are most women's lives saved.

No scientific article has ever claimed that because a cancer is detected by mammography, it is necessarily a life saved. Yet somehow this has become what the community and many physicians believe.

Dr. Welch estimates that, of women diagnosed with a cancer by screening, the chance that her life is saved is 13%. Importantly, the screening trials were conducted before the use of any kind of adjuvant therapy. In fact, the kind of adjuvant treatment we use today makes up for two-thirds of the benefit previously attributed to screening, suggesting the chance that a woman's life is saved by virtue of having a screen-detected cancer is closer to 4%.

Laura Esserman

So how could this be?

The answer lies in understanding the biology of breast cancer.

We now know that breast cancer is not one disease. Every breast cancer detected is not a killer cancer. In fact, most of the cancers found by mammographic screening are likely to be the ones that grow more slowly, and many will be indolent.

Because we understand that biology should dictate treatment, even when these tumors grow a bit bigger, treatment likely would be the same, as will be the outcome.

Again, emerging molecular tools such as Oncotype DX and MammaPrint allow us to assign therapy based on biology rather than tumor size.

In fact, almost 70% of the tumors mammographically detected in women aged 50 to 60 years will be biologically low risk based on the MammaPrint profile, half of which fit an ultralow risk or IDLE profile.

Many such tumors — if found the following year based on screening or by symptoms — would change little or not at all, and the timing would have little, if any, impact on outcome. This is because the biology of the tumor would not have changed, even though the tumor may have grown in size in the interim.

In contrast, the most aggressive breast cancers grow quickly and often present between normal screening exams — so-called interval cancers.

For these tumors, screening will make little or no difference in the type of treatment, as the aggressive biology dictates the treatment rather than tumor size, and outcome depends mostly on response to therapy.

These tumors often are hormone receptor-negative and/or HER-2/neu receptor-positive, although some hormone receptor-positive tumors exhibit aggressive features as well. Treatment for these tumors will be aggressive, regardless of size. The answer to improving outcome for women with the most aggressive tumors is to identify better therapeutic options.

Data now show that screening every 2 years does not result in any statistical difference in the number of more advanced cancers. Indeed, Finnish researchers have shown that screening every 3 years is as good as screening every year even for a woman in her 40s.

However, less screening results in fewer unnecessary biopsies and recalls. If we are more cognizant that screening mammography primarily helps to identify slower-growing cancers, we will be less anxious to recall women for very low-risk marginal findings. We also can use mammography more appropriately and reduce overtreatment, and the burden of screening on women.

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