The Benefits and Harms of Mammography Screening: Understanding the Trade-offs

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US Preventive Services Task Force and Breast Cancer Screening
Catherine D. DeAngelis et al. *JAMA*. 2010;303(2):172.
INTUITIVELY, CANCER SCREENING MAKES GOOD SENSE—find cancers early and treat them before they become dangerous. The intensely negative response to the US Preventive Services Task Force (USPSTF) recommendations about mammography,1 that women with their physicians might decide to screen later or less often, is not very surprising.

For years, physicians and patients have received a simple message about cancer screening, “Take the test not the chance.” The media, celebrities, politicians, advocacy groups, physician report cards (eg, HEDIS—Healthcare Effectiveness Data and Information Set), even US Postal Service stamps reinforce this message. And the public has embraced it. In a national survey of 500 US adults, 87% said they thought screening was almost always a good idea and most indicated they would overrule a physician who recommended against screening.2 Enthusiasm was so strong that for many individuals, screening was not a decision but a moral imperative; one-third thought an 80-year-old who chose not to have a Papanicolaou test, mammogram, prostate-specific antigen screening, or colonoscopy was irresponsible.

However screening is not simply about benefit, it also causes important harms. To make good decisions about screening, patients should understand the trade-offs3 (TABLE).

What is the magnitude of the benefit? It is estimated that without screening, 3.5 of 1000 women in their 40s will die of breast cancer over the next 10 years (ie, 996.5 of 1000 will not die of the disease).4 Screening reduces the chance of breast cancer death from 3.5 to about 3 of 1000.4 For most women with cancer, screening generally does not change the ultimate outcome; the cancer usually is just as treatable or just as deadly regardless of screening.3

The benefit of screening must be weighed against its harms. The discussion of harm has largely focused on false-positive screening tests. In one survey, 40% of women (n=109) who had a false-positive mammogram result described the experience as “very scary” or “the scariest time of my life.”2 Fortunately, such experiences are temporary. In retrospect, almost all women who received false-positive mammogram results said they were glad they had undergone the test. In another survey of 479 US women, more than one-third reported they would tolerate more than 10,000 false-positive mammograms for every breast cancer death avoided.6

False-positive test results are not the most important harm of screening—overdiagnosis is (ie, cancers detected by mammography that were never destined to cause symptoms or result in death). Because it is not possible to know which women are overdiagnosed, all are treated with surgery, chemotherapy, radiation, or some combination.5 Overdiagnosed women are unnecessarily diagnosed, undergo treatment that can only cause harm, and must live with the ongoing fear of cancer recurrence.

The discussion of overdiagnosis is often met with disbelief. In a previous survey,6 only 7% of women believed there could be breast cancers that grow so slowly that even without treatment a woman’s health would not be affected. The best evidence for overdiagnosis comes from the same randomized trials that demonstrated the benefit of mammography. Because women in the trials were randomly assigned to receive screening, the number of breast cancers that develop over time should be the same in each group. Initially, the number of women diagnosed with breast cancer should be higher in the mammography group because mammograms find tumors too small to be detected otherwise. Over time, the nonscreening group should catch up as the small tumors grow and become detectable. However, in the clinical trials, breast cancer diagnosis in the screened group remained persistently higher even after many years. This persistent difference represents overdiagnosis. Estimates of the rate of overdiagnosis vary. Based on 15-year follow-up of the Malmo trial,7 2 women are overdiagnosed for every breast cancer death avoided. Gøtzsche et al8 estimated this ratio to be 10 to 1.

Different women will interpret the benefits and harms of screening differently. For some women aged 40 to 49 years, the benefit of screening will seem worth the chance of false-positive results or overdiagnosis. For others, the harms will

See also pp 162, 166, 168, and 172.
Harms of screening helps to reach the goal, but other times less testing does. Patients live healthier longer lives. Sometimes more testing reframes its thinking about medical care. It is important for the public to remember that the goal of medicine is to help people live healthier longer lives. Sometimes more testing helps to reach the goal, but other times less testing does. It is essential to remember that the harms are just as real as the benefits.

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None reported.

### Disclaimer
The views expressed in this article do not reflect those of the US Department of Veterans Affairs or the US government.

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### REFERENCES