

IN EVERY ISSUE

Cancer Screening

BY BARNETT S. KRAMER, MD

Does the evidence always support intuition?

Intuition seems to dictate that any test capable of detecting cancer early, before the onset of symptoms, must be of benefit. Unfortunately, that intuition is wrong. More importantly, it can lead to serious harm.

All available screening tests for cancer can trigger harms; but not all of them are known to be of benefit. The benefits of some cancer screening tests do outweigh the harms (for example, cervical cancer screening; colorectal cancer screening; and mammography, although there is controversy about whether to begin at age 40 or 50), but in many cases we just don't know. In some cases, we even know that harms outweigh benefit.

Because it is very difficult to make healthy people better off than they already are, a guiding principle for cancer screening should be the famous Hippocratic injunction, "First, do no harm." Most people will not die of any specific cancer, whether they are screened or not. Therefore, they can't benefit from the screening test, but they can be harmed. For example, the lifetime risk of dying of prostate cancer is just over 3 percent. This means about 97 percent of men will not die of prostate cancer; but they can be harmed by screening and subsequent unnecessary therapy. Likewise, about 1 percent of women will die of ovarian cancer and 99 percent will not, irrespective of screening.

A highly counterintuitive harm of screening is "overdiagnosis." Screening tests are nearly always better at detecting slow-growing cancers than fast-growing, more lethal cancers. It has been estimated that as many as 50 percent of prostate cancers detected by PSA screening are so slow-growing that they never would have caused any medical problems had they not been detected by screening.

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Autopsy studies in men who died of causes unrelated to prostate cancer show that more than half of men over age 65 harbor silent prostate cancers. The fact is, more men die with prostate cancer than die of prostate cancer. Nevertheless, screening can detect many of these cancers and trigger unnecessary surgery, radiation, and/or hormonal therapy, resulting in serious adverse health effects

such as urinary or stool incontinence, and, in the case of hormonal therapy, bone mineral loss and risk of heart attack. These risks might be worth it if we were confident that prostate cancer screening saves lives—but we are not.

Overdiagnosis is not restricted to prostate cancer screening. Studies suggest it occurs with screening for a variety of cancers, including thyroid cancer, melanoma, lung cancer, and even breast cancer. In fact, overdiagnosis is probably the rule rather than the exception with cancer screening tests. With overdiagnosis, some cancers can be cured that didn't need to be cured in the first place. Accordingly, some screening can produce a net harm that nevertheless looks like a benefit in the eyes of the physician.

Another misleading phenomenon is known as “lead time bias,” when screening tests advance the date of diagnosis without necessarily changing the date of death. In the process, they may introduce the false impression of better survival simply because survival is measured from the date of diagnosis. Again, an ineffective, or even harmful, screening test could appear beneficial.

A useful source of information is the National Cancer Institute's PDQ, a free online database that describes what is known about the benefits and harms of all commonly used cancer screening tests (www.cancer.gov/cancertopics/pdq/screening). Armed with that information, you can make an informed decision with your doctor.

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