

Prostate Cancer Screening

Annually, an estimated 186,320 prostate cancer cases will be diagnosed, and about 28,660 deaths are expected. For an American male, the lifetime risk of developing prostate cancer is 1 in 6, but the risk of dying of prostate cancer is only 2.9% (1 in 34). Many more cases of prostate cancer do not become clinically evident, as indicated in autopsy series, where men who died from other causes have shown a 30-45% prevalence of prostate cancer in men in their 50's and an 80% prevalence in men in their 70's.

If 100 men over age 50 take the PSA test:

- 85 will have a normal PSA (though a small number of these men will have a cancer that was missed by the PSA test).
- 15 will have a higher than normal PSA and require further tests. After further testing, results will show:
 - 12 do not have prostate cancer.
 - 3 have prostate cancer.

In order for prostate cancer screening to be valuable, it must reduce disability and death caused by prostate cancer. Sensitivity of PSA has been estimated to be about 70-80%, while the specificity is estimated to be about 60-70%. PSA elevations can precede clinical disease by 5-10 years, or even longer. However, PSA is also elevated in a number of benign conditions, particularly benign prostatic hyperplasia (BPH) and prostatitis.

Positive predictive value: the proportion of men with an elevated PSA who have prostate cancer.

PSA level >4.0 ng/mL	positive predictive value:	30%
PSA levels between 4-10		25%
PSA levels >10		42-64%

However, nearly 75% of cancers detected within the "gray zone" of PSA values between 4-10 are organ confined and potentially curable. The proportion of organ-confined cancers drops to less than 50% for PSA values >10. Thus, detecting the curable cancers in men with PSA levels <10 presents a diagnostic challenge because the high false-positive rate leads to many unnecessary biopsies. The 5-year relative survival among men with cancer confined to the prostate (localized) or with just regional spread is 100%, compared with 31.9% among those diagnosed with distant metastases.

2009 European Randomized Study of Screening for Prostate Cancer (ERSPC) (182,160 men between the ages of 50 and 74 screened with PSA, median follow-up of nine years) found that 1410 men needed to be screened to prevent one prostate cancer death over nine years. 48 additional patients would need aggressive prostate cancer treatment to prevent one prostate cancer death. Given the indolent course of prostate cancer and the 5-10 year lead time of elevated PSA testing before prostate cancer diagnosis, any survival benefit from screening would not be realized for many years, while the burdens of screening and treatment, including harms from overdiagnosis and overtreatment, would occur immediately and potentially have lifelong consequences.

2009 Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial (76,693 men between the ages of 55 and 74, annual screening with PSA and DRE or usual care) found no benefit for annual PSA and digital rectal examination (DRE) screening after 7-10 years of follow-up.

HARM FROM SCREENING

Although prostate biopsies very rarely (<1%) cause complications serious enough to require hospitalization, the procedure can lead to anxiety and physical discomfort. Being diagnosed with prostate cancer is psychologically distressing, but even patients with a negative biopsy result may be distressed. Chronic anxiety can follow a negative prostate biopsy because this apparently favorable result cannot completely rule out prostate cancer given the relatively high false-negative biopsy rate.

Overdiagnosis refers to the detection by screening of conditions that would not have become clinically significant. When screening finds cancer that would never have become clinically significant, patients are subject to the risks of screening, confirmatory diagnosis, and treatment, as well as suffering potential psychosocial harm from anxiety and labeling. Overdiagnosis is of particular concern because most men with screening-detected prostate cancers have early-stage disease and will be offered aggressive treatment.

Risks of therapy — Even in the absence of treatment, many men found to have prostate cancer as a result of screening will have a lengthy period of time without clinical problems. However, undergoing radical prostatectomy and radiation therapies can lead to immediate complications:

-The operative mortality rate is about 0.5%, though the rate approaches 1% in men over 75 years

-Less serious, but more common complications include urinary incontinence, sexual dysfunction/impotence, and bowel problems. Radical prostatectomy can substantially decrease sexual function in 20-70% of men and lead to urinary problems in 15-50%

-External beam radiation therapy has been reported to cause erectile dysfunction in 20-45%, urinary incontinence in 2-16%, and bowel dysfunction in 6-25%.

- United States Preventive Services Task Force (USPSTF) concluded that there is insufficient evidence to assess the balance of benefits and harms of prostate cancer screening in men younger than age 75. The USPSTF recommends against screening for prostate cancer in men ages 75 or older because the harms of screening outweigh the benefits.
- The Canadian Task Force on Preventive Health Care recommends against screening for prostate cancer with PSA and states that there is insufficient evidence to recommend for or against screening with DRE.
- A number of European groups, including the European Union, recommend against screening for prostate cancer while awaiting the results of randomized trials.
- The American Cancer Society (ACS) emphasizes the need for clinicians to provide men with adequate information regarding the risks and benefits of screening. The ACS recommends that serum PSA testing and DRE should be offered annually to men 50 years of age and older who have a life expectancy of 10 years. The guidelines also stress the benefit of screening beginning at age 45 in patients at high-risk of developing prostate cancer (eg, black men and men with a first-degree relative with prostate cancer diagnosed at a younger age). PSA testing is recommended for men who ask their clinicians to make the decision about screening on their behalf. The American Urological Association (AUA) also supports this policy.
- Similar to the AUA and ACS, the American College of Physicians (ACP) recommendation states that "Rather than screening all men for prostate cancer as a matter of routine, physicians should describe the potential benefits and known harms of screening, diagnosis, and treatment; listen to the patient's concerns; and then individualize the decision to screen". The ACP also suggests that men between the ages of 50 to 69 years are most likely to benefit from screening. Black men and men with a positive family history of prostate cancer should be informed of their higher lifetime risk, although the available evidence does not suggest that they need to be treated differently from men at average risk.

Many prostate cancers detected with screening are unlikely to cause death or disability. Thus, a number of men will be diagnosed with cancer and potentially suffer the side effects of cancer treatment for cancers that never would have been found without prostate cancer screening. In other words, even if screening finds a cancer early, it is not clear in all cases that treating the cancer is necessary. There is no reliable screening test for prostate cancer, including PSA and DRE. PSA has a false positive rate of about 70% and a false negative rate of about 20%. Although screening for prostate cancer with PSA can reduce mortality from prostate cancer, the absolute risk reduction is very small. There remain important concerns about whether the benefits of screening outweigh the potential harms to quality of life, including the substantial risks for overdiagnosis and treatment complications.