

American College of Preventive Medicine Practice Policy

Screening for Prostate Cancer in American Men

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Based on a review of the current literature and recommendations, the American College of Preventive Medicine presents a practice policy statement on screening for prostate cancer in American men. (Am J Prev Med 1998;15:81-84) © 1998 American Journal of Preventive Medicine

Burden of Suffering

Prostate cancer is the most commonly diagnosed cancer in the United States (excluding skin cancers) and is second only to lung cancer as a contributor to cancer deaths in American men. In 1997, an estimated 209,900 new cases will be diagnosed and 41,800 men will die of prostate cancer.^{1,2} One in every five U.S. men will develop invasive prostate cancer before their death. Age-adjusted incidence of prostate cancer has been increasing over the last 50 years, with a sharper rise over the past decade associated mostly with increasing early detection. Disease-specific 5-year survival rates among white men are 100% when the cancer is localized, 94% for those with regional disease, and 31% for those with distant metastasis.¹ Genetic, environmental, and social risk factors have been identified for prostate carcinoma including familial, dietary, hormonal, and possibly environmental carcinogen influences.³ Incidence increases with age and those with a family history or African-American men are at higher risk of both developing and dying from prostate cancer. Benign prostatic hyperplasia, another common disorder of older males characterized by an enlarged prostate gland, has not been directly linked to prostate cancer, although both are associated with advancing age and androgen metabolism.⁴ An unknown fraction of prostate cancers are clinically insignificant. Prostate cancer is characterized by a wide variability in rates of disease progression and long preclinical asymptomatic phases. Many men die with prostate cancer, not because of it.

Description of the Preventive Measures

The principal screening tests for detection of asymptomatic prostate cancer are the digital rectal examina-

tion (DRE) and measurement of the serum tumor marker prostate specific antigen (PSA). Transrectal ultrasound is no longer considered a first-line screening test for prostate cancer, but does play a role in the investigation of patients with abnormal DRE or PSA.

Evidence of Effectiveness

Both DRE and PSA can detect occult prostate cancer. Reported values for the sensitivity, specificity, and positive predictive value of DRE and PSA may not reflect true values; however, because the number of false-negative cases is often unknown, studies traditionally screen volunteers, whose cancer risk may differ from the general population, and fine-needle biopsies may miss cancerous lesions. DRE has a reported sensitivity of 55%–68% in asymptomatic men,^{5,6} but values as low as 18%–22% have been reported.^{7,8} The reported positive predictive value of DRE is 6%–33%.^{6,9}

A PSA of greater than 4.0 ng/ml, the accepted threshold for further diagnostic evaluation, has been reported to be over 80% sensitive in detecting prostate cancer, although some studies report a much lower sensitivity of 29%.⁷ PSA appears to have increased sensitivity for aggressive cancers¹⁰ and those with histopathologic features associated with progression: large volume, poorly differentiated cells, extracapsular penetration.^{11–14} PSA has limited specificity because elevations also occur in men with benign disease (e.g., prostatic hypertrophy, prostatitis). The reported positive predictive value of PSA in asymptomatic men is 28%–35%.^{6,13,15,16} The specificity and/or positive predictive value of PSA may be enhanced by measuring PSA density (PSA value divided by gland volume measured by transrectal ultrasound),¹⁷ PSA velocity (annual rate of change of PSA),¹⁸ the free PSA ratio,^{19–23} age-adjusted PSA reference ranges,^{24,25} or increasing the cut-off value. Combining PSA with DRE increases the positive predictive value to 49%.⁶

There is no direct evidence whether or not early detection and treatment of prostate cancer reduces mortality because randomized clinical trials to address

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this question have not been completed. Observational studies of DRE report no improvement in mortality,^{26,27} but the designs of these studies have been challenged. Screening does detect cancers at an earlier stage,^{13,28} which is theorized (but unproven) to improve survival. The incidence of metastatic disease decreases over time in settings where screening occurs.²⁹ However, these findings are of uncertain significance. They may be complicated by lead time or length-time biases and by alterations in the effectiveness of treatments. Because screening may be detecting cancers that would never have caused morbidity or mortality in the host, the value of early detection remains unclear.

The effectiveness of treatment for prostate cancer is also uncertain. Well-designed randomized controlled trials of surgery, radiation, and other treatment modalities have not been completed. Observational studies suggest that, for localized and moderately or well-differentiated cancers, observation (“watchful waiting”) may be as beneficial as treatment in men followed for over 12 years.^{30–33} It is clear that men with a life expectancy of less than 10 years rarely benefit from radical prostatectomy.

Both screening and treatment can be harmful. A positive DRE and/or PSA requires repeat testing and can lead to more invasive diagnostic tests, such as needle biopsy, which carries a small risk of infection, sepsis, or bleeding and may be performed on 18% of the screened population.⁶ Radical prostatectomy and radiation therapy can produce serious complications affecting quality of life such as urinary incontinence, erectile dysfunction, or strictures and, rarely, can be fatal. Decision analyses weighing the benefits and risks suggest that one-time screening produces a modest gain measured in days to months, or a net loss in quality-adjusted life expectancy,^{34–36} results vary depending on the cohort’s age, and other assumptions. Little is known about the individual psychological burden involved in prostate cancer screening and decision-making regarding treatment.

Public Policy Considerations

Observational studies report variable rates of compliance with screening recommendations and official recommendations, even if tests are “free.”⁹ In one longitudinal study of male volunteers, at 4 years 79% of men returned for PSA screening.³⁷ Another population-based study in France invited men to either PSA or DRE-transrectal ultrasound screening (TRUS) and reported 33.7% attendance at DRE-TRUS screening and 66.9% attendance at PSA screening.³⁸ Understanding of prostate cancer screening may be low among the general population; one study found poor knowledge about PSA testing (e.g., more than half had never

heard of the test) among men 2 weeks after they had undergone PSA testing.³⁹ In addition, primary care providers may not have adequate knowledge about the correct use of DRE and PSA. One survey reported that 59% of primary care respondents did not know whether DRE or PSA was more sensitive, and 45% agreed that all patients with PSA >4.0 ng/ml had cancer.⁴⁰ Inadequate knowledge among primary care providers and patients may cause difficulty in obtaining adequate informed consent. Few studies have addressed which types of materials are optimal for informed consent, although one study found that in their population of men of lower socioeconomic status, informed consent was associated with decreased interest in PSA screening.⁴¹

Prostate cancer screening is likely to be expensive; it has been estimated that the first year of mass screening would likely cost between \$12 billion and \$28 billion,^{7,42} with costs increasing as the U.S. population ages. Without solid evidence on the effectiveness of prostate cancer screening in reducing mortality and morbidity, cost-effectiveness cannot be properly calculated. Controlled studies of PSA screening may encounter problems with patient recruitment because of the increasing use of PSA screening in the general population. It is unclear whether PSA screening results will affect insurance eligibility. Recommendations regarding screening tests are often used as the basis for insurance decisions regarding whether to cover those tests.

Recommendations of Other Groups

The American Urological Association and the American College of Radiology recommend annual DRE and PSA screening beginning at age 50 and annual PSA screening beginning at age 40 for African-American men and other men with a positive family history of prostate cancer. The American Cancer Society recommends these tests be offered annually to men who are age 50 and over, who have at least a 10-year life expectancy; annual screening is offered earlier for African-American men or those with at least two first-degree relatives affected. The American College of Physicians and Office of Technology Assessment recommend giving men information about the benefits and harms of screening to help them make a decision based on personal preferences. The U.S. Preventive Services Task Force and the Canadian Task Force on the Periodic Health Examination recommended against the routine screening (the Canadian Task Force found insufficient evidence to make a recommendation on DRE). Technology assessment agencies in Canada, England, Sweden, and Australia have recommended against routine population screening for prostate cancer.

Rationale Statement

Prostate cancer is a significant and growing cause of morbidity among U.S. men and is not amenable to primary prevention. Screening can detect prostate cancer early, and early detection has the potential to decrease both morbidity and mortality, but these benefits are unproven and may not be realized because of the characteristics of this disease (e.g., prevalence of latent, clinically insignificant prostate cancer, indolent growth rate, and treatment-associated morbidity). For now, there is no convincing evidence that early detection and treatment improve outcomes. When cancers are well or moderately differentiated, expectant management may be as effective as surgery and only palliation is possible for cancers that have spread beyond the prostatic capsule. While early detection of some tumors may translate into decreased mortality, it is difficult to predict definitively which men will die of prostate cancer and which will die with it. Widespread screening may burden a large number of men with both psychological and physical complications, which may offset potential benefits. Since the best option depends on personal preferences, men considering PSA screening deserve information about the potential benefits and harms of available options and the quality of the supporting evidence.

Recommendation of the American College of Preventive Medicine

The American College of Preventive Medicine recommends against routine population screening with DRE and PSA. Men age 50 or older with a life expectancy of greater than 10 years should be given information about the potential benefits and harms of screening and the limits of current evidence and should be allowed to make their own choice about screening, in consultation with their physician, based on personal preferences. Methods and tools for helping patients review this information are available;^{41,43} however, the ACPM recommends further research be conducted in optimizing the process of patient education and informed consent.

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