INSTRUCTIONS

The following case study, “Early Detection and Treatment of Prostate Cancer” is accompanied by a continuing medical education (CME) evaluation that consists of 5 multiple-choice questions. After reading the case study, carefully consider each of the questions in the CME evaluation on page 67. Then, circle your selected answer to each question on the CME evaluation form on page 68. In order to receive CME credit, at least 3 of the 5 questions must be answered correctly. The estimated time for this CME activity is 1 hour.

OBJECTIVES

After participating in the CME activity, primary care physicians should be able to:
1. Know the risk factors and natural history of prostate cancer
2. Know the accuracy of screening tests for prostate cancer
3. Understand the potential benefits and known risks of prostate cancer screening
4. Know the available treatment options for localized prostate cancer as well as their risks and benefits
5. List the minimum information that should be communicated to patients regarding prostate cancer screening
6. Identify several tools for facilitating informed consent for prostate cancer screening

INTRODUCTION

Prostate cancer is the most common nondermatologic malignancy and the second leading cause of cancer mortality in men. It is estimated that in the year 2000, 180,400 new cases of prostate cancer will be diagnosed and 31,900 men will die of the disease [1]. Risk factors for prostate cancer include age, family history of prostate cancer, African American race, and possibly dietary fat intake [2]. The total annual Medicare expenditure for prostate cancer exceeds $1.4 billion [3].

Because prostate cancer is such a prevalent and potentially serious disease and because screening tests and treatment options are available, early prostate cancer detection and treatment would seem a common sense strategy for reducing disease-specific morbidity and mortality. However, conclusive evidence of benefit from this strategy is lacking. This article will clarify what is known about the risks and benefits of prostate cancer screening, describe what information needs to be communicated to patients, and discuss methods for facilitating patient participation in this important health care decision.

CASE STUDY

Initial Presentation

A 67-year-old white man presents to his primary care physician requesting information about prostate cancer testing.

History

The patient states that he has had “prostate problems” for several years. The patient describes his symptoms as nocturia 2 to 3 times per night, increased urinary frequency, and decreased force of his urinary stream. He is worried because he has heard that prostate cancer can cause the urinary symptoms he is having. He denies urinary incontinence or hematuria. The patient has reduced his caffeine and alcohol intake and has begun taking an over-the-counter preparation of saw palmetto extract, with modest improvement in symptoms.

The patient has a history of hypertension and diabetes. There is no family history of prostate cancer. His medications, in addition to saw palmetto, include lisinopril, glyburide, and vitamin E.

Physical Examination

The patient’s physical examination is unremarkable except for the presence of a firm, large prostate without nodules. Results of a urinalysis are within normal limits.

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Should this patient be screened for prostate cancer?

The goal of screening for prostate cancer is to detect clinically important cancers early so that treatment can be provided and deaths and disability from prostate cancer prevented. Population-based screening seeks to achieve this goal at a reasonable cost while minimizing the harms of screening. However, there is disagreement as to whether early detection efforts in prostate cancer do more good than harm. The harms of screening are known; however, the benefits of screening are uncertain because the randomized trials needed to vigorously test the effect of early treatment on death from prostate cancer have not been completed. In the absence of results from randomized trials, which will not be available for at least several years, most organizations are recommending against the routine use of screening tests and instead suggesting that physicians provide their patients with information about the potential risks and benefits of screening and assist patients in weighing the risks and benefits based on their own values and preferences [4–6]. That is, the decision whether to screen should be shared between physician and patient. This shared decision-making process requires that the physician be familiar with the risk factors and natural history of prostate cancer, the accuracy of prostate cancer screening tests, the available treatment options, and the risks and benefits of screening and treatment.

For patients with lower urinary tract symptoms, there is some debate as to whether the prostate-specific antigen (PSA) test should be considered a screening test or a diagnostic test. Lower urinary tract symptoms are common in elderly men and have many causes, including prostate cancer. The most common cause of such symptoms, however, is benign prostatic hyperplasia (BPH). About one third of men older than 50 years have lower urinary tract symptoms consistent with BPH. Evidence strongly suggests that men with lower urinary tract symptoms are at no greater risk for prostate cancer than asymptomatic men [4,7,8]. Because mildly elevated PSA values are common in men with BPH and because the efficacy of early detection of prostate cancer is uncertain, PSA testing in men with lower urinary tract symptoms is considered an optional screening test rather than a diagnostic evaluation [4].

Further Questioning by Patient

The patient is reassured that his symptoms are not likely due to prostate cancer and do not increase his risk for having prostate cancer, but he still wonders whether he should be screened. He has heard “what a big killer prostate cancer is” and wants to protect himself from a prostate cancer death.

What are risk factors for prostate cancer?

Risk Factors

Risk factors for the development of prostate cancer include age, African American race, family history of prostate cancer, and possibly dietary fat intake (Table 1) [2]. More than 75% of all men diagnosed with prostate cancer are older than 65 years [9]. The prevalence of incidental prostate cancer detected at autopsy is 30% for men over age 50 years and ranges from 12% for men in their 40s to greater than 60% for men in their 80s. Incidence rates for non–organ-confined prostate cancer increase dramatically with age, from 82/100,000 for men aged 50 to 54 years to 1326/100,000 for men aged 70 to 74 years [10].

Men with a father or brother with prostate cancer are twice as likely to develop prostate cancer as men without affected relatives. Incidence of clinical prostate cancer is low in Asian men and higher in Scandinavian men. It is unclear if this is due to genetic or environmental factors. The age-adjusted incidence and mortality of prostate cancer is higher for African American men (234 and 56 per 100,000, respectively) than for white men (135 and 24 per 100,000) [10]. The rates for African American men are also higher than for black men living in Africa or Asia.

Many men, including the patient in this case study, use herbal products or dietary supplements to treat or prevent prostate problems. One such supplement, saw palmetto, is
well tolerated and provides modest improvement in urinary symptoms associated with BPH [11]. However, no herbal products have been demonstrated to reduce the risk of developing prostate cancer. While definitive evidence is lacking, men may be able to lower their risk of developing and dying from prostate cancer by eating diets low in saturated fats (especially red meat) and calcium and high in tomatoes and tomato sauce (lycopenes), soy (isoflavones), vitamin E, and selenium [12]. Ongoing randomized controlled trials are determining whether vitamin E, selenium, or finasteride (Proscar, a 5-alpha reductase inhibitor commonly used to treat symptoms of BPH) reduce prostate cancer incidence and mortality. The protective effect of vitamin E and selenium may be due to their antioxidant activity. Because prostate cancer is androgen dependent, drugs like finasteride, which inhibit the conversion of testosterone to dihydrotestosterone, may also decrease the incidence and progression of prostate cancer.

Agent Orange, a defoliant utilized in the Vietnam War, has been associated with increased risk of prostate cancer. Other putative risk factors such as occupation, sexual behavior, infectious agents, vasectomy, cigarette smoking, and benign prostate conditions have not been demonstrated to alter the risk of prostate cancer [2].

**What is the natural history of prostate cancer?**

Findings from cohort and autopsy studies suggest that the course of prostate cancer is frequently indolent. It commonly occurs in older men with comorbid conditions who may die of other causes before their prostate cancer becomes clinically significant. Therefore, the natural history of prostate cancer may be different than that of other malignancies in that most men with prostate cancer do not die of their disease.

For a 50-year-old man with a life expectancy of 25 years, the lifetime risks of microscopic, clinically evident, and fatal prostate cancer are approximately 42%, 10%, and 3%, respectively [1,13]. The lifetime risk of being diagnosed with prostate cancer is 15.9% [14]; this rate is higher than the rate for clinically evident cancer because it includes asymptomatic disease detected during screening. The disease-specific 15-year mortality rate in men with clinically localized prostate cancer treated with observation and delayed palliative hormone therapy (watchful waiting) ranges from 10% to 40% and varies with the histologic characteristics of the tumor and the comorbidities and age of the patient [15–18]. Morbidity from disease progression includes hematuria, bladder obstruction, and, in men with metastatic disease, pain, weakness, and paralysis.

**How accurate are screening tests for prostate cancer?**

**DRE**

The digital rectal examination (DRE) has historically been part of the periodic routine health examination but has not been clearly demonstrated to prevent advanced or fatal prostate cancer. To test for prostate cancer, the physician places a gloved finger inside the rectum and palpates the posterior aspect of the prostate gland. Among men 50 years of age and older, approximately 2% to 3% who receive one DRE are found to have prostatic induration, marked asymmetry, or nodularity. Such findings increase the odds of finding a clinically significant (> 0.5 mL) localized tumor by up to twofold but increase the odds of having extracapsular disease by three- to ninefold (Table 2). Thirty percent to 70% of DRE-detected tumors are still confined to the prostate gland—the type of cancers early detection programs seek to identify. The proportion of clinically localized cancers detected by DRE may actually decrease with subsequent DRE. Studies of interrater reliability for DRE show poor reproducibility [19].

Data from community–based studies suggest that the positive predictive value of DRE for prostate cancer is 15% to 30% [4,19]. Because of the poor sensitivity of DRE, a normal test does not appreciably lower the odds of having clinically significant prostate cancer.

**PSA**

Another way to test for prostate cancer is to measure the level of prostate-specific antigen in serum. A cutoff of 4 ng/mL is most commonly used to define an abnormal result. PSA
measurement appears to be more sensitive but less specific than DRE for detection of prostate cancer [19]. It can detect cancers before they are palpable and may be particularly useful for diagnosing aggressive cancer.

The positive predictive value of PSA measurement varies from 17% to 28%, depending on degree of elevation of PSA level. For PSA levels between 4 and 10 ng/mL, the positive predictive value is 21%; this value increases to between 42% and 64% for PSA levels greater than 10 ng/mL. The positive predictive value appears to be independent of age, suggesting that increased disease prevalence is balanced by decreased test specificity in older men [20]. Use of PSA measurement results in a cancer detection rate of 3%, with approximately 60% of tumors found to be confined to the prostate at surgery [19].

An elevation in PSA level greater than 4 ng/mL triples the odds that a man 50 years of age or older has clinically significant but still localized prostate cancer (Table 2). It also increases the odds of extracapsular tumors by three- to five-fold. PSA levels above 10 ng/mL markedly increase the odds that a man has an extracapsular tumor.

PSA testing fails to detect a substantial number of men with prostate cancer. Approximately 20% to 30% of men with prostate cancer have PSA levels below 4.0 ng/mL. Therefore, while a PSA level less than 4.0 ng/mL provides excellent reassurance that a man does not have extracapsular disease, it cannot rule out organ-confined prostate cancer (Table 2). Detection rates and predictive values decline significantly in subsequent years of testing.

PSA measurement is not specific for prostate cancer. It can be elevated in men with noncancerous conditions including BPH, acute prostatitis, urinary retention, and genitourinary instrumentation such as cystoscopy or prostate biopsy. Up to 50% of men with BPH will have elevated PSA levels, but most will be falsely positive for prostate cancer. For example, approximately 400 men out of 1000 with moderate symptoms of BPH will have an abnormal PSA or rectal examination; of these 400, only 30 will have cancer [4]. But all 400 will have undergone diagnostic procedures (eg, prostate ultrasound and biopsy), with their attendant costs and potential risks. Modifications to PSA testing such as measurement of “free and complexed” PSA, PSA density and velocity, and use of age-specific reference ranges may improve specificity and reduce the number of unnecessary biopsies by up to 20% [21]. However, these modifications decrease sensitivity, may require additional blood tests or ultrasound examinations, and have not been demonstrated to improve survival.

**Combined Testing Strategy**

Because DRE and PSA appear to detect different cancers, most physicians who screen for prostate cancer use both DRE and PSA measurement and recommend biopsy if results of either test are abnormal [19]. Combined screening with DRE and PSA increases cancer detection rates to 4% and may increase the proportion of cancers that are still localized upon pathology examination. Using this combined screening strategy, if either test result is abnormal, the positive predictive value is 15% to 21%. Approximately 1 out of 4 asymptomatic men will have an abnormal PSA measurement or rectal examination, and the proportion of tested men who consequently undergo a prostate biopsy ranges from 15% to 40%, depending on age [19,22]. PSA and DRE testing may increase cancer-related testing, treatment, and morbidity [19,22,23].

- What are the benefits, risks, and costs of prostate cancer screening?
- Does screening for prostate cancer improve survival?

PSA measurement is a relatively simple and low-cost blood test that could conceivably save a man’s life and avert cancer-related morbidity. However, routine DRE or PSA has not been proven to reduce the risk of dying of prostate cancer. Unlike with breast and colon cancer, where several large trials have proven that early detection and treatment lower disease-specific mortality, there have been no randomized trials showing that the detection of prostate cancer by PSA screening or DRE decreases disease-associated morbidity or mortality. Additionally, in contrast to findings from epidemiologic studies indicating that cervical cancer screening is temporally and geographically associated with a large reduction (50%) in disease-specific mortality, epidemiologic and administrative database studies of prostate cancer provide conflicting results and do not clearly demonstrate that prostate cancer screening and treatment decreases mortality [14,24–29]. Results from randomized controlled screening and treatment trials, which will be available within 5 to 10 years [30–33], are needed before we can know if testing and treatment improve survival.

Decision models have been developed to examine the possible outcomes of one-time DRE and PSA measurement [22]. The maximum average health benefit averaged across all patients is no more than a few additional weeks of life expectancy. However, in men receiving a diagnosis of prostate cancer, successful treatment with surgery or radiation may add up to 3 years of life for men in their 50s and 0.4 years for men in their 70s [22]. Based on the model, prostate cancer screening is only marginally beneficial for men 70 years of age and older, even using very favorable assumptions.

Potential risks of screening include the psychological distress and morbidity associated with further testing and treatment. The risks of biopsy are relatively minor but
include bleeding and infection in as many as 40 men in 100. However, the psychological consequences of a suspicious screening test result (eg, anxiety, depression) appear to be appreciable [34]. Additionally, because the false-negative rate of biopsy in the setting of an elevated PSA has been demonstrated to be as high as 10% to 15%, many men may remain anxious about the implications of their PSA measurement even after 1 or more sets of negative biopsies [34]. Risks of screening also include the morbidity and small but definite risk of mortality associated with aggressive treatment (see "Treatment Options," below).

**Costs of Screening**

The cost of a one-time PSA test is about $45. However, this does not take into account the costs associated with the cascade of testing, staging, and treatment prompted by an abnormal PSA level. If these costs are included, the cost per person screened is $400 and the cost for the first year of a 1-year national screening program is more than $12 billion [22]. The costs for subsequent years would be lower because the number of prevalent cancers detected and treated would drop.

If assumptions regarding cancer-specific mortality rates, diagnostic and treatment costs, complications, and effectiveness that favor screening are used in models, the estimated costs of screening per year of life saved are comparable to cost-effectiveness ratios for many proven and accepted screening programs: $19,000 for prostate cancer screening, $21,000 for breast cancer screening in women older than 50 years, and $30,000 for colon cancer screening. However, if these assumptions are replaced with values more consistent with available evidence, the costs of prostate cancer screening rise dramatically (more than $400,000 per year of life saved) [22].

**Available Treatment Options**

Prostate cancer treatment goals are to prevent premature death and disability by reducing the risk of prostate cancer morbidity and mortality while minimizing adverse treatment effects. The appropriate therapy for men with clinically localized prostate cancer is not known [4,18,19,35]. Acceptable treatment options include surgery (radical prostatectomy); radiation therapy (external-beam or interstitial radiation [brachytherapy]); cryosurgery; early hormonal treatment; and surveillance (conservative management, careful monitoring, and utilization of androgen suppression if and when there is evidence of disease progression) (Table 3).

The only available information on survival and complication rates associated with prostate cancer treatment options comes from cohort studies. Treatment selection bias strongly influences the outcomes in such studies (eg, men treated with radical prostatectomy are generally younger, healthier, and have less advanced prostate cancer then men treated with radiation or surveillance). Until randomized trials comparing survival and complication outcomes for various treatments are completed, we cannot be sure to what extent differences in outcomes and complications across treatments are due to selection bias or to the treatments themselves. For this reason, data derived from a select group of men who received a treatment should not be used to predict outcomes for individual patients.

**Radical Prostatectomy**

Radical prostatectomy involves surgical removal of the prostate gland, seminal vesicles, and surrounding lymph nodes. It offers the potential to completely remove a prostate cancer that can progress and cause disability and death. The 10-year disease-specific survival following radical prostatectomy is about 85% and ranges from 94% for men with well-differentiated prostate cancer to 67% for men with poorly differentiated disease [18,36]. The 5-year cumulative incidence of men with pathologically organ-confined cancer requiring additional treatment after prostatectomy has been estimated at 24%. Less than 60% of men who undergo radical prostatectomy have pathologically confirmed organ-confined disease. These men are unlikely to have had their cancer completely eliminated and may have received ineffective therapy. For men undergoing radical prostatectomy with pathologically regional cancer, the 10-year disease-specific and metastasis-free survival rates are about 50% and 30%, respectively [4]. In men with positive lymph nodes at the time of surgery, survival is improved by early utilization of androgen suppression therapy.

Fatal complications occur in approximately 0.5% to 1% of all men treated with surgery but may exceed 2% in men aged 75 years and older. Approximately 8% of men older than 65 years of age suffer major cardiopulmonary complications within 30 days of operation [4]. Additional complications include sexual dysfunction in 60% to 90% of men, urinary incontinence requiring pads or clamps to control wetness (30% to 36%), total urinary incontinence (2% to 4%) [37,38], urethral stricture (18%), fecal incontinence (5%), and bowel injury requiring surgical repair (1%) [4].

**External-Beam Radiation Therapy**

External-beam radiation therapy has the potential to kill prostate cancer cells without a surgical procedure through a series of radiation treatments lasting up to 6 weeks. Ten-year disease-specific survival for men treated with radiation
therapy has been reported as 76% and ranges from 90% for well-differentiated to 53% for poorly differentiated prostate cancer [4,39]. Three years after radiation treatment, 24% of men older than age 65 reported follow-up treatment with androgen deprivation for cancer recurrence. Complication rates are generally lower in patients treated with radiation than with surgery but include treatment-related mortality (< 0.5%), impotence (30% to 60%), urinary incontinence requiring wearing absorptive pads to control wetness (7%), and chronic bowel dysfunction (10% to 20%) [4,38,39].

Brachytherapy
Brachytherapy is a form of radiation (interstitial therapy) in which iodine-125 or palladium-103 radioisotope needles are permanently placed into the prostate. Ten-year disease-specific survival rates for men treated with brachytherapy have been reported as high as 98% [39]. However, most men treated with brachytherapy have small-volume and low-grade tumors (PSA < 10 ng/mL and Gleason histologic scores < 6), which have an excellent long-term prognosis with surveillance. Brachytherapy failure, as defined by PSA levels, is higher in men with high-grade malignancies compared with men treated with radical prostatectomy. If brachytherapy is used in men with high-grade malignancies, additional treatment with external-beam radiation is generally utilized and is associated with higher complication rates. Complications of brachytherapy include urinary retention (6% to 7%), incontinence requiring pads (12% to 18%), cystitis/urethritis (4% to 7%), proctitis (6% to 16%), and impotence (44% to 79%) [38,39].

Percutaneous Cryosurgical Ablation
Percutaneous cryosurgical ablation involves the use of multiple small-diameter cryoprobes that can freeze a number of target areas of the prostate. Transrectal ultrasound monitors probe placement and ice propagation over time. Urethral warming is used to minimize cryo-induced urethral sloughing. Short-term, uncontrolled data from selected centers indicate that 5-year biochemical-free survival for patients treated with cryosurgical ablation exceeded 70% and that the 5-year biopsy-proved disease-free rate was 79% [40]. Complication rates for a series of cryoablation studies have been reported: impotence (65%); scrotal edema (10%); sloughed urethral tissue (3%); incontinence, urethrorectal fistula, and prostatic abscess (1%) [40].

Androgen Suppression
Androgen suppression has usually relied on surgery (orchietomy) to eliminate serum testosterone or estrogens such as diethylstilbestrol (DES) to provide similar effects. New alternatives include luteinizing hormone-releasing hormone (LHRH) agonists and nonsteroidal antiandrogens. Androgen suppression has been shown to delay clinical progression and/or palliate symptoms of metastatic disease in over 80% of men with advanced prostate cancer [3]. However, it has not been clearly demonstrated to improve

| Table 3. Treatment Options for Clinically Localized Prostate Cancer |
|------------------|-----------------------------|-----------------------------|
| Treatment Option  | Potential Benefits                                      | Potential Risks                                      |
| Surgery           | May eliminate cancer; generally well tolerated               | Hospitalization for major surgery; operative-related death, incontinence, impotence, bleeding, pulmonary embolism, urethral stricture, bladder neck contracture |
| External-beam radiation | May eliminate cancer; generally well tolerated               | Does not remove prostate gland and may not eradicate cancer; 6–8 weeks of outpatient therapy; death, incontinence, proctitis, cystitis, impotence, urethral stricture, bladder neck contracture, major bleeding |
| Brachytherapy     | May eliminate cancer; generally well tolerated; single outpatient session | May not be effective for larger prostate glands or more aggressive tumors; urinary retention, incontinence, impotence, cystitis/urethritis, proctitis; long-term outcomes from representative national sample not reported |
| Cryoablation      | May eliminate cancer; generally well tolerated; single outpatient session | Does not remove prostate gland and may not eradicate cancer; impotence; incontinence, scrotal edema, sloughed urethral tissue; prostatic abscess; urethrorectal fistula; no long-term outcomes from national sample |
| Hormonal therapy  | Usually lowers PSA levels; slows cancer progression           | Gynecomastia, impotence, diarrhea, osteoporosis, lost libido, hot flashes |
| Surveillance      | No immediate side effects or complications; low initial cost; most men do not need therapy and survive the cancer at least 10 years | Cancer could advance, become incurable and cause death; patients’ quality of life could be painfully restricted before he dies; additional treatments may be necessary, not effective, and have side effects |

Note: Treatments are listed as options because the available evidence is inadequate to determine whether any one therapy provides superior length or quality of life for men with clinically localized prostate cancer. PSA = prostate-specific antigen.
survival. Clinicians often monitor PSA levels and offer androgen suppression at the time of cancer diagnosis or when PSA levels rise [3,41]. Consequently, more men are being considered for androgen suppression and treatment is being initiated earlier in the natural history of the disease.

Because men treated in randomized controlled trials conducted in the 1960s included men who were older and had more advance cancers than men diagnosed today, the effect of early androgen suppression on length and quality of life is not known. Early use of androgen suppression in asymptomatic men may relieve anxiety by lowering PSA levels and providing patients with the sense that some intervention is being performed.

Potential harms from androgen suppression include weakness, osteoporosis, hot flashes (40%), gynecomastia (9%), impotence (70%), nausea, vomiting or diarrhea (2% to 8%), and loss of libido (5% to 30%). While DES and orchietomy are relatively inexpensive, the cost of LHRH agonists and/or antiandrogens exceeds several thousand dollars per patient per year. These newer agents are not safer or more effective [3]. The adverse effects and costs are particularly important when considering treatment in men with long life expectancy or treatment durations, such as younger men with lower-grade cancers. Additionally, androgen suppression does not cure prostate cancer. Over time, prostate cancer loses its dependence on androgens, and patients develop hormone refractory disease. The risk of disability and death due to prostate cancer in these men is high.

Watchful Waiting
Surveillance (expectant management, conservative management) involves monitoring men and providing palliative therapy if and when there is evidence of disease progression. Prostate cancer-specific survival in men treated with surveillance is approximately 80% after 15 years of follow-up but varies by histologic grade [15–18]. The overall likelihood that men with prostate cancer detected by DRE will remain free of symptomatic progression requiring palliative treatment is 70% at 5 years and 40% at 10 years.

Men with well-differentiated prostate cancer (biopsy specimens with Gleason score of 2 to 4 disease) face a minimal (< 5%) risk of symptoms or death from prostate cancer within 15 years of diagnosis. Conversely, men whose biopsy shows poorly differentiated prostate cancer (Gleason score 7 to 10 disease, approximately 30% of men diagnosed with prostate cancer) face a high risk of death (42% to 87%) from prostate cancer within 15 years when treated conservatively, and the 5-year disease specific mortality ranges from 20% to 40%. Men with Gleason score 5 or 6 tumors face a modest (15% to 20%) risk of death from prostate cancer that increases slowly over at least 15 years of follow-up. Because the lead time associated with PSA testing is at least 5 years, outcomes after 20 years of follow-up for men with PSA-detected cancers are likely to be similar to the 15-year results reported in men with palpable tumors [15].

The advantage of surveillance is that it avoids the early morbidity, mortality, and costs associated with surgery, radiation, cryotherapy, and early androgen deprivation therapy while still providing palliative therapy if symptoms develop [15–18,36]. However, conservative management does not remove a cancer that is potentially curable. If untreated, localized prostate cancer may progress and cause disability or death. Morbidity from local or regional disease progression includes hematuria, bladder obstruction, and lower extremity edema. Metastatic prostate cancer can result in pain, weakness, paralysis, and death. Palliative treatment with delayed androgen suppression can slow disease progression but does not cure prostate cancer. Palliative treatments are associated with adverse effects and costs. Whether early intervention with surgery or radiation decreases the need for subsequent palliative treatment is not known.

Making Decisions about Treatment
Because differences in survival across prostate cancer treatments reported from cohort studies may be explained by differential selection bias, results from these studies do not provide clear-cut evidence for the superiority of any one treatment. Only randomized controlled trials can provide this evidence. However, only a few randomized controlled studies comparing these prostate cancer treatment options have been completed. Two studies directly compared surgery with surveillance or radiation [42,43]. Both were conducted prior to PSA testing and were too small to definitively conclude that surgery and radiation are ineffective. One trial comparing radiation with surgery indicated that disease recurrence was higher in men treated with radiation [43]. Another trial comparing radical prostatectomy with surveillance found no difference in survival after a median follow-up of 23 years [42]. Until results of ongoing randomized controlled trials of screening and treatment are available, decisions about screening and treatment should be tailored to patients’ values and comorbid conditions. Men most likely to benefit from early intervention have a relatively long life expectancy, high-grade prostate cancer still confined to the prostate gland, low risk of complications from the intervention, and a preference for early intervention after being informed about the potential risks and benefits of the different options.

- What should patients be told about prostate cancer screening and what can physicians do to help patients make an informed decision?
Clinicians should be aware that not all existing prostate cancer screening education materials are well suited to promoting patient involvement in screening decisions. An inventory the authors conducted of available prostate cancer screening education materials revealed that most either explicitly promote regular prostate cancer screening or, in the case of a recently produced American Cancer Society flyer, mix messages advocating routine screening with more balanced information on the risks and benefits of PSA testing. The materials described below take no particular position on prostate cancer screening and provide a relatively balanced representation of the risks and benefits of testing and treatment. These characteristics make them well suited to promoting patient involvement in the screening decision. Most have been separately evaluated for impact on patient knowledge and/or screening preferences, but the relative feasibility and effectiveness of the various tools described has not been studied.

**Foundation Video Program**

The Foundation for Informed Medical Decision-Making (Hanover, NH) developed a 23-minute video program entitled “The PSA decision: what YOU need to know” to augment clinician-patient discussions about prostate cancer screening. The video educates patients about prostate cancer, the PSA test, available prostate cancer treatments and possible outcomes; summarizes the potential risks and benefits of screening; helps patients assess their own values and preferences relevant to the decision of whether to be screened; and encourages them to discuss their preferences with their doctor. The video covers all of the ACP-recommended information and more. It was designed for 100% patient comprehension at the 10th-grade level but has been tested on relatively low-literacy populations. Evaluations of the video suggest it can dramatically increase patient PSA and prostate cancer knowledge [45–47], is favorably evaluated by patients [49], has a positive impact on patient satisfaction [46], and influences patient screening and treatment preferences [45–47]. However, provider resistance, patient noncompliance, and difficulties securing the space, staff time, and other resources needed to ensure patient access to the video are commonly cited barriers to its use [49,50]. Before attempting to broadly implement this strategy, users should ensure that these potentially formidable barriers can be adequately addressed. The video can be purchased from Health Dialogue, Inc. (877-277-5900) for a fee of $250 per video. The video is copyrighted and cannot be duplicated. The Foundation has also produced a similar video on treatment options to assist in treatment decisions for men with localized prostate cancer.

**Minneapolis VA Center Pamphlet**

Print materials have inherent appeal as educational tools because they can be produced at relatively low costs [45,46] and can be broadly and repeatedly dispersed with...
questions about prostate cancer screening during their appointment or asking patients to review written materials while you step out of the room. Proactive approaches might include mailing patients either informational pamphlets or invitations to view information videos prior to prevention or wellness visits or asking patients visiting the clinic during a designated “prostate cancer screening education month” to review written or video materials while they are waiting to be seen. Since research examining the relative effectiveness and feasibility of these approaches is lacking, the decision of which approach to use should be based on the literacy level of the target population, the availability of resources and support needed to implement each strategy, and the organizational characteristics of the practice (e.g., whether patients have scheduled wellness visits, expected length of visits, availability of non-physician staff for patient education).

Since most of these patient education tools do not cover all of the ACP recommended information, they should be supplemented with a face-to-face discussion of the issues. As part of this discussion, physicians should ask patients to state their screening preferences and should solicit information about the reasons behind their preferences to ensure that the causal assumptions underlying their preferences are based on fact rather than misconception.

Provision of Patient Information and Shared Decision Making

The physician explains that prostate cancer is an important health problem but that the benefits of screening have not yet been proven. He states that the 2 commonly used screening tests may detect cancer and save lives, but that the tests may fail to detect disease in patients...
PROSTATE CANCER

Table 4. Elements of Informed Consent for Prostate Cancer Screening

1. Prostate cancer is an important health problem
2. The benefits of one-time or repeated screening and aggressive treatment of prostate cancer have not yet been proven
3. Digital rectal examination and prostate-specific antigen (PSA) measurement can both have false-positive and false-negative results
4. The probability that further invasive evaluation will be required as a result of testing is relatively high
5. Aggressive therapy is necessary to realize any benefit from the discovery of a tumor
6. A small but finite risk for early death and a significant risk for chronic illness, particularly with regard to sexual and urinary function, are associated with these treatments
7. Early detection may save lives
8. Early detection and treatment may avert future cancer-related illness


who have cancer, and more commonly, many men without cancer will have an abnormal PSA test. He describes available testing and treatment options in the event of an abnormal PSA result as well as the risks associated with treatment. He states that because of the potential risks and uncertain benefits of screening, practice guidelines recommend that physicians provide patients with information about the risks and benefits of screening and individualize the decision based on the patient’s values and preferences. He says that he would like to give the patient some written materials to review and would like to go over any questions or concerns the patient has after reading them.

• Are there men in whom PSA testing is more likely to be beneficial?

African American men and men with a family history of prostate cancer are at increased risk for developing prostate cancer and may be more likely to benefit from testing. Rather than routinely testing men, counseling about the potential risks and benefits of prostate cancer screening is recommended beginning at age 40 years for African American men or those with a family history of prostate cancer, and for all other men beginning at age 50 years [4]. Screening high-risk groups improves the positive predictive value of a screening test because it is used in a population with an enriched probability of a disease. Given the relatively high prevalence of prostate cancer in all groups, however, prior probability is not a concern nor markedly changed by risk group. For both average- and high-risk groups, the question is whether screening and treatment favorably affect outcome. We don’t know the answer to this; targeted screening (routine screening of high-risk groups) is not convincingly supported by the evidence.

Younger men may benefit more from screening. Younger men have a much lower prevalence of prostate cancer than older men; however, because they are generally in good health and have a long life expectancy, they have a greater number of years to be exposed to the risk of disease progression and may therefore benefit more from early treatment if they have prostate cancer. In contrast, a man 70 years of age has a 20-fold increased risk of having nonlocalized prostate cancer compared to a man 50 years of age [2]. However, because of shorter life expectancy, the older man has fewer years for symptomatic disease progression. Therefore, he is less likely to receive the potential benefits from detection and treatment that occur 10 to 20 years in the future, but he is still exposed to their immediate risks.

Although PSA testing is common in men 70 and 80 years old or with coexisting medical conditions, testing is not recommended in men with a life expectancy of less than 10 to 15 years because of the relatively indolent course of prostate cancer and the morbidity associated with early detection and treatment. Routine testing and treatment in these men is more likely to produce net harm [4]. Prostate cancer screening is also not recommended for men who do not want to know if they have prostate cancer and perhaps for men who would prefer no early treatment if prostate cancer were found.

While routine DREs do not significantly alter PSA values, levels can be elevated for several weeks in men with acute prostatitis or urinary retention and following prostate surgery, biopsy, or instrumentation. Therefore, PSA testing should not be performed in these situations.

CONCLUSION

Increasingly, clinicians are being encouraged to involve patients in clinical decision making. Shared decision making based on patient preferences is particularly important when the optimal management strategy is unknown. This is the case with prostate cancer.

Routine screening for prostate cancer remains controversial. The lack of evidence about the effect of early detection and treatment on mortality leaves clinicians with the responsibility of educating patients and clarifying issues for them so that they might make the decision about screening that is right for them. While most physicians would accept the value of informed consent and shared decision making for prostate cancer screening and treatment, lack of both time
References

46. Wilkins EG, Lowery JC, Hamill JB. Patient preferences in PSA screening: the impact of shared decision-making videos [abstract]. Presented at the 1999 VA HSR&D meeting; Washington, DC.

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EVALUATION FORM: Early Detection and Treatment of Prostate Cancer

DIRECTIONS: Each of the questions or incomplete statements below is followed by four possible answers or completions of the statement. Select the ONE lettered answer that is BEST in each case and circle the corresponding letter on the answer sheet.

1. All of the following factors increase a man’s risk for developing prostate cancer EXCEPT
(A) Increased age
(B) Family history
(C) Presence of benign prostatic hyperplasia
(D) African American race

2. All of the following statements about testing for prostate cancer are true EXCEPT
(A) DRE is poorly sensitive
(B) 20% to 30% of DRE-detected tumors are confined to the prostate gland
(C) PSA testing fails to detect some men with prostate cancer
(D) Up to 50% of men with benign prostatic hyperplasia will have elevated PSA levels

3. All of the following statements about PSA testing are true EXCEPT
(A) It has been demonstrated to decrease disease-specific morbidity
(B) The positive predictive value of the test depends on degree of elevation of PSA level
(C) The positive predictive value of the test appears to be independent of age
(D) It is not specific for prostate cancer

4. Which of the following is NOT a potential benefit of prostate cancer screening?
(A) Peace of mind
(B) Preventing prostate cancer
(C) Averting cancer-related morbidity
(D) Extending survival

5. All of the following are acceptable treatment options for localized prostate cancer EXCEPT
(A) Radical prostatectomy
(B) Radiation therapy
(C) Expectant management (surveillance)
(D) Saw palmetto extract
EVALUATION FORM: Early Detection and Treatment of Prostate Cancer

To receive CME credit for this case study, read the case study and then answer the multiple-choice questions on page 67. Circle your answers below. Also, please respond to the 4 questions that follow. Then, detach the evaluation form and mail or FAX to:

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Circle your answer to the CME questions below:

1. A  B  C  D
2. A  B  C  D
3. A  B  C  D
4. A  B  C  D
5. A  B  C  D

Please answer the following questions:

1. In general, how do you rate the information presented in the case study?
   • excellent  • good  • fair  • poor

2. Do you find the information presented in this case study to be fair, objective, and balanced?
   • yes  • no

3. Name three clinical conditions that, in your experience, lead to less than optimal patient outcomes:
   Condition 1: ________________________________________
   Condition 2: ________________________________________
   Condition 3: ________________________________________

4. Name three clinical topics you would like explored in future JCOM® case studies:
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