



Complete Summary

GUIDELINE TITLE

Prostate specific antigen (PSA): best practice policy.

BIBLIOGRAPHIC SOURCE(S)

American Urological Association. Prostate-specific antigen (PSA) best practice policy. *Oncology* 2000 Feb;14(2):267-86. [130 references]

Carroll P, Coley C, McLeod D, Schellhammer P, Sweat G, Wasson J, Zietman A, Thompson I. Prostate-specific antigen best practice policy--part I: early detection and diagnosis of prostate cancer. *Urology* 2001 Feb;57(2):217-24. [59 references] [PubMed](#)

Carroll P, Coley C, McLeod D, Schellhammer P, Sweat G, Wasson J, Zietman A, Thompson I. Prostate-specific antigen best practice policy--part II: prostate cancer staging and post-treatment follow-up. *Urology* 2001 Feb;57(2):225-9. [38 references] [PubMed](#)

COMPLETE SUMMARY CONTENT

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- METHODOLOGY - including Rating Scheme and Cost Analysis
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- IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Prostate cancer

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management

CLINICAL SPECIALTY

Internal Medicine
Urology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To provide current information on the use of prostate specific antigen (PSA) testing for:

- the evaluation of men at risk for prostate cancer
- assistance in pretreatment staging, and
- the post-treatment monitoring and management of men with this disease

TARGET POPULATION

Screening

- Asymptomatic men age 50 or over with an anticipated life expectancy of 10 or more years.
- Asymptomatic men age 40 to 50 years old with a family history of prostate cancer or African-American ethnicity with an anticipated life expectancy of 10 or more years

Management

- Men with prostate cancer

INTERVENTIONS AND PRACTICES CONSIDERED

Detection

1. Prostate Specific Antigen (PSA)
2. Digital Rectal Examination (DRE)

Pre-treatment Staging

1. Use of pretreatment serum PSA to predict the response of prostate cancer to local therapy
2. Gleason grading system
3. Radiologic staging
4. Surgical staging
5. Bone scans

Post-treatment Management

1. The use of periodic PSA and DRE tests to monitor disease recurrence

MAJOR OUTCOMES CONSIDERED

Detection

- Sensitivity and specificity of prostate specific antigen (PSA) levels in detecting prostate cancer

Treatment

- Morbidity (rates of postoperative erectile dysfunction, incontinence, anxiety)
- Mortality
- Cost

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

MEDLINE was searched using the keywords screening, PSA, Prostate specific antigen, early detection, guidelines. Articles were sought for the period 1966 to 1999.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The panel formulated its policy statements and recommendations by consensus, based on review of the literature and the panel members' own expert opinions. After panel members agreed on the general areas to be covered, each member took on the task of conceptualizing and writing a section of the document in an area where he had specific expertise. The panel later met to merge the individual manuscripts into a single document. Both before and after this merger, every part of the document was thoroughly critiqued by panel members in written comments and verbally in a series of conference calls. Over the course of successive manuscript revisions, the panel scrutinized and modified the conceptual framework, reworked the wording of key statements, and reexamined supporting evidence reported in the literature—until panel members reached consensus.

The panel did not use any particular methodology to develop its consensus statements. As noted above, these statements are based upon panel members' expert opinions and knowledge of the published literature, and are referenced with what the panel considered to be the most appropriate publications. The panel also did not address issues of costs or cost-effectiveness in this document or systematically incorporate patient values and preferences in the analysis. However, the panel did include in the document ample information to assist patients in decision-making regarding the early diagnosis, staging, and treatment follow-up of prostate cancer.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Over the course of successive manuscript revisions, the panel scrutinized and modified the conceptual framework, reworked the wording of key statements and reexamined supporting evidence reported in the literature until panel members reached consensus. After the panel reached an initial consensus, 47 peer reviewers representing the following medical specialties reviewed the manuscript: family practice, internal medicine, radiology, oncology and urology. The panel made numerous document changes based on the insight from peer reviewers.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Summarized by the National Guideline Clearinghouse (NGC):

- I. The Use of Prostate Specific Antigen (PSA) for Early Detection of Prostate Cancer
 - A. Candidates for early detection testing
 - Men age 50 or more with an anticipated life expectancy of 10 or more years
 - Mean age 40 to 50 with a family history of prostate cancer or African-American ethnicity with an anticipated life expectancy of 10 or more years

Decisions regarding early detection of prostate cancer should be individualized and benefits and consequences should be discussed with the patient before PSA testing occurs. Not all men over age 50 are appropriate candidates for screening efforts for this disease. Ideally, physicians should consider a number of factors including patient age and comorbidity as well as preferences for the relevant potential outcomes. Some organizations have even recommended that informed consent should be obtained prior to PSA testing.

- B. Tests for early detection: PSA and digital rectal examination (DRE)
 - PSA testing detects more tumors than does DRE, and it detects them earlier. However, the most sensitive method for early detection of prostate cancer uses both DRE and PSA. Both tests should be employed in a program of early prostate cancer detection. Evidence from three uncontrolled studies that allow a direct comparison of the yields of PSA and DRE suggests that combining both tests improves the overall rate of prostate cancer detection when compared with either test alone. The value of serial determinations of PSA or serial DRE in patients with a normal initial examination is unknown. There is evidence that serial PSA determinations lead to a decrease in detection of pathologically advanced disease.
 - Transrectal ultrasonography is not a useful test for early prostate cancer detection; it adds little to the combination of PSA and DRE.
 - C. Test results
 1. A urologist should be consulted for a prostate biopsy when any of the following findings are present:
 - PSA is 4.0 ng/ml or more
 - A significant PSA rise from one test to the next (some investigators suggest that a rise of 0.75 ng/ml or greater in a year is reason for concern)
 - DRE is abnormal
 2. A variety of factors can affect PSA and should be considered in the interpretation of results.

Factors which can increase PSA levels include:

- Common prostatic disease (prostatitis, benign prostatic hyperplasia (BPH) and prostate cancer)
- Physical activity
- Infection
- Medications
- Prostate biopsy*
- Cystoscopy*

* PSA testing should be postponed for at least 3 to 4 weeks after prostate biopsy and cystoscopy due to substantial elevation of PSA levels.

Factors which can decrease PSA levels include:

- Medications, such as finasteride (used for the treatment of BPH and male pattern baldness)
 - Surgical or medical castration
 - Herbal medicines or compounds
3. Performance of PSA: Although methods exist to improve cancer detection rates (test sensitivity) or to decrease the number of unnecessary prostate biopsies (test specificity), each method involves a tradeoff and should be discussed with the patient.

Sensitivity

- PSA testing in patients with normal serum PSA levels (defined as 4.0 mg/ml or less) has a sensitivity of about 67.5% - 80%.
- Methods to improve sensitivity:
 - Adjust the "normal" PSA level to a lower value for younger men (age-adjusted PSA)
 - Follow serum PSA values in an individual patient over time (PSA velocity)

Specificity

- The specificity of PSA testing is 60% to 70% when the PSA level is >4.0 ng/ml.
- Methods to improve specificity:
 - Age adjustment (using higher "normal" PSA levels for older men)
 - Free-to-total PSA ratios (the optimal cut-off point for free/total PSA below which a prostate biopsy would be recommended is unknown)
 - Adjusting the normal value for the size of the prostate (PSA Density = PSA/Gland Volume)

II. The Use of PSA for Pretreatment Staging of Prostate Cancer

1. Pretreatment serum PSA predicts the response of prostate cancer to local therapy

- PSA levels of less than 10.0 ng/ml are most likely to respond to local therapy
2. Determine tumor grade based on Gleason grading system
 - Gleason score of 2-4: lower biologic aggressiveness
 - Gleason score of <5-6: intermediate biologic aggressiveness
 - Gleason score of >7: biologic aggressive tumor
 3. Additional tests, based on preliminary staging include:

Radiologic Staging

CT or MRI scans are generally not indicated for the staging of men with clinically localized prostate cancer when the PSA is less than 25.0 ng/ml.

Surgical Staging

Pelvic lymph node dissection for clinically localized prostate cancer may not be necessary if the PSA is less than 10.0 ng/ml or if the PSA is less than 20.0 ng/ml and the Gleason score is less than or equal to 6.0

Bone Scan

Routine use of a bone scan is not required for staging asymptomatic men with clinically localized prostate cancer when their PSA is equal to or less than 20.0 ng/ml

- Because metastatic disease is significantly more common in advanced local disease or in high-grade disease, and as some high-grade prostate cancers are PSA-negative, it is reasonable to consider bone scans at the time of diagnosis when the patient has poorly differentiated or high-grade, stage \geq T3 prostate cancer, even if the PSA is \leq 10.0 ng/ml

III. The Use of PSA for the Post-Treatment Management of Prostate Cancer

0. Periodic PSA and DRE tests should be offered to monitor disease recurrence
 1. Detectable PSA indicates disease recurrence
 2. Serum PSA should decrease and remain at undetectable levels after radical prostatectomy
 3. Serum PSA should fall to a low level following radiation therapy and cryotherapy and should not rise on successive occasions

Two methods to define biochemical absence of disease

- The first method is to determine nadir PSA levels following treatment. Very low (e.g., < 0.5 ng/ml) or undetectable levels are not likely to demonstrate clinical or biochemical relapse following treatment, at least not within 5 years of treatment
- The second method, recommended by the American Society for Therapeutic Radiology and Oncology (ASTRO), defines biochemical recurrence on the basis of three consecutive rises

in serum PSA above nadir. This group recommends that PSA be measured no more often than every 3 to 6 months to detect meaningful rises beyond the intrinsic variability of the assay

4. The pattern of PSA rise after local therapy for prostate cancer can help distinguish between local and distant recurrence
 - Patients whose serum PSA (1) fails to fall to undetectable levels after surgery or rises despite radiation or cryotherapy, (2) rises within 12 months of all forms of local treatment, or (3) doubles in less than six months are more likely to have distant disease
 - Patients who develop biochemical recurrence late (i.e., > 24 months after local treatment) and have PSA doubling times exceeding 12 months are more likely to have persistent/recurrent local disease
5. The nadir serum PSA and percent PSA decline at 3 and 6 months predict progression-free survival in men with metastatic prostate cancer treated with androgen deprivation. The degree of PSA decline following second-line treatment of metastatic disease correlates with disease survival
 6. Bone scans are indicated for the detection of metastases following initial treatment for localized disease. The level of PSA that should prompt a bone scan is uncertain

CLINICAL ALGORITHM(S)

Clinical algorithms are provided for the use of prostate specific antigen (PSA) in:

- detection of prostate cancer
- pre-treatment staging of prostate cancer
- post-treatment management of prostate cancer

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation. Policy statements and recommendations are based on review of the literature and the panel members' own expert opinions or consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

General benefits of implementing guideline:

- Improved prostate cancer detection while minimizing unnecessary prostate biopsies
- Reduce the morbidity and mortality associated with prostate cancer, including bone pain, inanition, anemia, sexual dysfunction, ureteral obstruction, and bony fractures

POTENTIAL HARMS

Screening

- Tradeoff associated with improving prostate-specific antigen (PSA) sensitivity: Both age-adjusted PSA and PSA velocity will increase the number of cancers detected, but both will also increase the number of men undergoing biopsy.
- Tradeoff associated with improving PSA specificity: All three methods to improve PSA specificity (age-adjusted PSA, free-to-total PSA ratio, PSA density) will reduce the number of biopsies in men who do not have prostate cancer but will increase the risk that some prostate cancers will be missed.
- Complications of confirmatory testing: Prostate biopsy by means of a transrectal, ultrasound guide, are rarely complicated by rectal bleeding, hematuria, or prostatic infection. After biopsy, blood in the stool or urine usually disappears in a few days. Blood in the semen can be seen for up to several weeks after biopsy.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Because of the biologic variability of prostate cancer and the lack of a completed randomized, controlled trial that proves the benefit of early detection, the use of prostate-specific antigen (PSA) for prostate cancer early detection remains controversial. Two large randomized controlled trials (RCTs) are underway to evaluate whether early detection and treatment of prostate cancer reduces the mortality rate. Until these RCTs are completed, it will not be known whether the value (possible reduction in morbidity and mortality) of the early diagnosis of prostate cancer is sufficient to outweigh the cost and morbidity (for example, erectile dysfunction, incontinence and anxiety) associated with disease treatment.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Feb

GUIDELINE DEVELOPER(S)

American Urological Association, Inc. - Medical Specialty Society

SOURCE(S) OF FUNDING

American Urological Association, Inc.

GUIDELINE COMMITTEE

PSA Best Practice Policy Task Force

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Members: Ian Thompson, MD; Peter Carroll, MD; Christopher Coley, MD; Greg Sweat, MD; David McLeod, MD; Paul Schellhammer, MD; John Wasson, MD; Anthony Zietman, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Panel members received no remuneration for their efforts, and each member provided a conflict of interest document.

ENDORSER(S)

American Foundation for Urologic Disease - Disease Specific Society

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available at the [American Urological Association Web site](#).

Print copies: Available to physicians from the American Urological Association, Inc., 1000 Corporate Boulevard, Linthicum, MD 21090.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available for physicians to distribute to patients:

- Prostate Cancer Awareness for Men. Patient education brochure.

Print copies: Available to physicians from the American Urological Association, Inc., 1000 Corporate Boulevard, Linthicum, MD 21090. Copies can be purchased for \$10/25 brochures.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on March 28, 2000. The information was verified by the guideline developer on April 10, 2000.

COPYRIGHT STATEMENT

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