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## Prostate-specific antigen screening: An update of physician beliefs and practices<sup>★, ★★, ★</sup>

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### Abstract

PSA testing for early detection of prostate cancer decreased dramatically following the 2012 PSA screening recommendation against routine screening of asymptomatic men. In an assessment of the screening behaviors of primary care providers, the majority (61%) of family medicine and internal medicine practitioners who responded to a 2016 DocStyles online survey (608 of 1003) recommended prostate-specific antigen (PSA) testing based on individual risk or other factors, rather than routinely screening all men for prostate cancer.

### Keywords

Primary care physicians; Prostate cancer screening; Prostate specific antigen; PSA test

## 1. Introduction

Screening for prostate cancer using the prostate-specific antigen (PSA) test remains controversial. Although the U.S. Preventive Services Task Force (USPSTF) recommended against routine screening of asymptomatic men in 2012, recent studies show that providers continue to screen for prostate cancer in about 25%–30% of men of screening age (Li et al., 2015; Drazer et al., 2015; Jemal et al., 2015). As an update to prior reports on primary care physician (PCP) practices around PSA screening (Hall et al., 2011a; Richards et al., 2012), our study reports 2016 data on physicians' screening behaviors and beliefs about PSA testing for screening asymptomatic men, and factors that affect physicians' decisions to recommend (or not recommend) screening. Revised prostate cancer guidelines are currently being finalized (in 2017) and recommend that men 55–69 years make an individualized screening decision together with their physician. No routine screening is recommended for men under 55 years, 70 years or older, or high risk (African American or those with a family history) men in these age groups (United States Preventive Services Task Force). As shared

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decision making and informed patient-provider discussions become increasingly important in the current environment of clinical care, we expect that there may be variations in recommendations for PSA testing based on provider specialty, as previous studies have found (Zavaski et al., 2016; Tasian et al., 2012). For this reason, we also explored whether PSA test recommendation varied between family medicine (FM) and internal medicine (IM) PCPs.

## 2. Method

We examined DocStyles data, an annual web-based survey of U.S. healthcare professionals that assesses provider attitudes and practices related to various health issues and their use of health information. Providers were eligible to participate if they actively saw patients, worked in an individual, group, or hospital setting, and had practiced medicine for at least 3 years in the U.S. The survey was fielded from June 9 to July 1, 2016. Quota sampling from SERMO's Global Medical Panel<sup>1</sup> ensured that targeted provider types and specialties (nurse practitioners (NP), FM, IM) were adequately represented. This analysis is restricted to FM and IM PCPs. Detailed description of the survey is provided elsewhere (Bornstein et al., 2017). Respondents were paid an honorarium of \$21–\$90 for completing the survey. The Centers for Disease Control and Prevention (CDC) licenses the results of the DocStyles survey from Porter Novelli. Analysis of these results was exempt from IRB approval because personal identifiers were not included in the data provided to the CDC.

### 2.1. Analysis

The survey asked about the following physician characteristics: sex (male, female), race/ethnicity (non-Hispanic (NH) white, NH black, NH Asian, NH other, Hispanic), specialty (FM or IM), number of years practicing medicine ( < 10, 11–20, >20), practice location (Northeast, South, Midwest, West), practice setting (individual outpatient, group outpatient, inpatient), and number of patients seen weekly (continuous). Respondents were asked about the initiation of physician-patient discussions about prostate cancer screening as well as the following 7 beliefs concerning the use of PSA for early detection of cancer:

1. A yearly PSA test for asymptomatic men over 50 should be the standard of care.
2. African American men and men with a first-degree relative diagnosed with prostate cancer should be routinely screened with a PSA test.
3. Patients' decisions to be screened should be based on discussion regarding what is known about the diagnosis and treatment of early prostate cancer.
4. Asymptomatic African American males are at higher than average risk of prostate cancer.
5. Asymptomatic males with a family history of prostate cancer are at higher than average risk of prostate cancer.
6. The PSA test extends life.

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<sup>1</sup>SERMO is a global market research company. <http://www.sermo.com>

7. The PSA test has acceptable sensitivity and specificity and positive predictive value as a screening test.

Survey questions also asked about factors considered in the decision to use the PSA test for early detection of prostate cancer among asymptomatic men. The nine factors were patient family history of prostate cancer, patient requested testing, older patient, African American race, provider belief that screening is efficacious, provider belief that benefits outweigh the limitations, provider training, provider concerns about legal liability, and community practice patterns. Twelve hundred fifty six completed surveys were received. Excluding 253 NPs, the analytic sample included 1003 PCPs (480 FM and 523 IM); the survey had a response rate of 70.5%.

Responses to survey questions on beliefs about the use of the PSA test were structured as a 5-point Likert scale and dichotomized for analysis as strongly agree/agree vs undecided/disagree/strongly disagree in keeping with methods used in other studies (Volk et al., 2013). Responses to questions on factors influencing whether physicians discuss PSA testing were coded as extremely influential/very influential vs somewhat influential/slightly influential/not at all influential. We used descriptive (unadjusted) statistics to summarize survey items to characterize the sociodemographic and clinical variables of the analytic sample. To examine factors associated with recommending the PSA test, we conducted logistic regression on the dichotomized outcome of: 1) recommending PSA testing and 2) not offering the PSA test. Respondents who were categorized as recommending the test routinely offered and recommended the PSA test for all asymptomatic patients regardless of whether the patient asked about the test. Those who were categorized as not offering PSA did not offer the test to any patient regardless of risk or other patient factors or only when the patient asked for the test. We also conducted separate logistic regression analyses of factors considered by PCPs in PSA decision making. For each factor, we controlled for provider sex, race, number of years practicing medicine, and number of patients seen weekly (continuous). We calculated adjusted odd ratios (AORs) and 95% confidence intervals (CIs). Pearson's pairwise correlation coefficients were assessed using Bonferroni-adjusted significance level testing at the 5% level. Analyses were conducted in SAS version 9.3 (Cary, NC) and STATA version 14.0 (College Station, TX).

### 3. Results

PCPs were mostly male (72%) and non-Hispanic white (59%). About half of the respondents had been practicing medicine for about 15 years. Most practiced in group outpatient settings (65%), and more than half worked in a group of six or more practitioners. The median number of patients seen per week was 100. The proportions of IM and FM providers were similar (52% IM, 48% FM). A significantly greater proportion of IM than FM physicians were male (78% vs 65%, Asian (30% vs 21%), had practiced 10 years (35% vs 25%), practiced in inpatient settings (25% vs 4%), and were located in the Northeast (32% vs 21%).

One quarter (25.4%) of PCPs routinely offered and recommended a PSA test for all asymptomatic male patients of screening age, regardless of whether the patient asked about

the test; 60.6% offered and recommended a PSA test to some patients, taking individual risk and other factors into account; and 14% did not offer a PSA test to any male patients, regardless of risk or other patient factors, unless a patient asked for the test. About one-third (37%) of PCPs agreed or strongly agreed that a yearly PSA test for asymptomatic men over age 50 years should be the standard of care, and nearly three quarters (74%) agreed or strongly agreed that men at higher-than-average risk of prostate cancer (African American men and men with a first-degree relative diagnosed with prostate cancer) should be routinely screened with a PSA test. Two-fifths (40%) agreed or strongly agreed that the PSA test has acceptable sensitivity, specificity, and positive predictive value as a screening test. The majority (75%) strongly disagreed, disagreed, or were undecided as to whether the PSA test extends life. Irrespective of the physician specialty, agreeing that a yearly PSA test should be the standard of care for asymptomatic men over age 50 years was strongly correlated with the belief that the PSA test extends life (pairwise correlation coefficient of 0.68), and also strongly correlated with the belief that the PSA test has an acceptable sensitivity, specificity, and positive predictive value as a screening test (pairwise correlation coefficient of 0.69).

The three most commonly reported factors in decisions to use PSA tests were: 1) the patient has a family history of prostate cancer (71%), 2) the patient requested the PSA test (67%), and 3) the patient is an African American male (52%). Other reasons for recommending a PSA test were that the benefits of the test outweigh the limitations (43%), provider training was to recommend the test (36%), concerns about liability (35%), a belief that the test is efficacious (25%), and other providers in the community recommended testing (17%). The three most common reasons for recommending *against* PSA testing were: 1) short life expectancy (based on factors other than age; 69%), 2) poor patient functional status (52%), and 3) multiple medical comorbidities (46%). Lack of time to discuss PSA testing during the patient's visit (31%) and need to focus on patient's current complaints/disease (40%) were factors rated "extremely influential" or "very influential" for whether PSA testing was discussed with patients.

More years of practicing medicine was significantly associated with recommending PSA testing (AOR = 3.30; CI: 1.88–5.79) (Table 1). Patient request for PSA (AOR = 1.69, CI: 1.14–2.49) and belief in the efficacy of PSA screening (AOR=6.56 CI 2.99–14.39) were associated with recommending PSA. Patient request for PSA failed to reach significance among internists. No other significant differences between FM and IM providers were seen in the Table 1 factors.

Compared to IM providers, FM providers had greater odds (AOR = 1.54, CI 1.15, 2.07) of considering patient request for the PSA test in the recommendation to screen after adjustment (Table 2). No other significant differences between FM and IM providers were observed.

#### 4. Discussion

Our findings provide a 2016 update of older reports on provider attitudes, beliefs, and practices related to recommendation of the PSA test for screening asymptomatic men for prostate cancer (Hall et al., 2011a; Richards et al., 2012). Among our sample, about one-

third of PCPs agreed that yearly PSA test for asymptomatic men aged 50 or older should be the standard of care, and three-quarters said that men at higher-than-average risk of prostate cancer (African American men and men with a first-degree relative diagnosed with prostate cancer) should be routinely screened with a PSA test. The perception that PSA screening is appropriate for men at higher-than-average risk has increased over time. A PCP study conducted in 2008 found that 53% and 69% of respondents discussed and recommended the PSA test for African American men and men with a family history, respectively (Rim et al., 2014).

Volk et al. reported that medical specialty was the only variable associated with propensity to screen, with FM more likely to use PSA screening than IM (Volk et al., 2013). In the current study, we observed minor differences between IM and FM physicians in factors that predict recommending the test. We observed a more substantial difference in the weight given to specific factors when considering whether to recommend screening. Family medicine providers had greater odds of considering patient request for the test in the decision to recommend PSA testing. This pattern may be explained by practice setting as a quarter of internists practiced in inpatient settings, where less preventive care is done.

USPSTF released a draft revised PSA screening recommendation in April of 2017 that is being finalized. The new document recommends that men 55–69 years make individualized decisions about screening for prostate cancer after discussion with a clinician, so that each man has an opportunity to understand the potential benefits and harms of screening and to incorporate his values and preferences into his decision (United States Preventive Services Task Force). Implementation of the new recommendation will require greater patient-PCP engagement to discuss the benefits and harms of testing. However, lack of time and a need to focus on a patient's current complaints/disease were factors that contributed to not discussing PSA with patients for 30–40% of our study sample. The practical challenges of maximizing patient-PCP discussions during in-office visits may potentially be alleviated by engaging patients about their clinical care before the office visit, in the waiting room, or with innovative uses of decision aid technology.

This study has several limitations. The DocStyles PCP panel and data may not accurately represent PCPs in the United States, since participation in the survey was voluntary. First, self-selection bias might have been introduced by the honorarium provided for survey completion. Second, quotas were set for the types of PCPs included (specialty, race/ethnicity, and age) and excluded some respondents once specific accruals were reached. Third, the survey contains self-reported data, which are subject to overestimation of behaviors thought to be desirable. Finally, we were not able to identify other studies describing PCP beliefs about PSA for routine screening since 2012 to provide context for our findings.

In the current study, about a quarter of PCPs sampled reported that they routinely offered and recommended a PSA test for all asymptomatic patients, a reduction from the 80% estimate reported from data collected in 2008 where FMs and IMs were equally likely to offer and recommend PSA testing (Hall et al., 2011a). Regardless of training, the majority (61%) of PCPs in our sample only offered and recommended a PSA test to some patients

after taking individual risk and other factors into account rather than routinely screening all men. This behavior is consistent with the recommendations of professional organizations (Qaseem et al., 2013; American Urological Association) against routine screening for prostate cancer for all men, mirrors the overall decline in use of the PSA test by PCPs since 2000 (Schmidt, 2017; Misra-Hebert et al., 2017), and acknowledges PCP consideration of individual patient factors as well as patient preferences and values that may influence each screening decision. Some PCPs continue to routinely screen asymptomatic men for prostate cancer, but the majority appear to practice more in line with the 2012 recommendation. Going forward, trends in PSA test use will likely increase as PCPs adopt the 2017 recommendation although the ability to overcome time limitations in the clinical encounter remains an obstacle (Hall et al., 2011b). Given that 74% of PCPs in our sample agreed that screening is appropriate for high risk men, we would expect an increase in the number of PCPs offering and recommending the PSA test to these patients in particular, understanding that discussion of the benefits as well as harms of PSA test are critical to patients' decision-making about the test.

## Abbreviations

<b>CDC</b>	Centers for Disease Control and Prevention
<b>FM</b>	family medicine
<b>IM</b>	internal medicine
<b>PCPs</b>	primary care physicians
<b>PSA</b>	prostate specific antigen

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**Table 1**

Factors associated with recommending PSA testing<sup>a</sup> among family medicine and internal medicine primary care physicians, DocStyles 2016.

Demographic characteristics	Recommend PSA test			
	All PCPs (FM/IM, n = 1003)		Family medicine (n = 480)	Internal medicine (n = 523)
	n (%)	AOR <sup>b</sup> (95% CI)	AOR (95% CI)	AOR (95% CI)
Practitioner specialty				
Family medicine	480 (47.8)	Reference		
Internal medicine	523 (52.1)	1.04 (0.68, 1.58)		
Sex				
Male	724 (72.2)	0.94 (0.61, 1.44)	0.68 (0.37, 1.27)	1.12 (0.60, 2.09)
Female	279 (27.8)	Reference	Reference	Reference
Number of years in practice				
10 years	303 (30.2)	Reference		
11–20 years	391 (39.0)	1.78 (1.16, 2.73)	1.75 (0.90, 3.43)	1.97 (1.09, 3.57)
>20 years	309 (30.8)	3.30 (1.88, 5.79)	2.35 (1.10, 5.01)	6.21 (2.22, 16.56)
Patient request of PSA is considered in decision to use PSA test	673 (67.1)	1.69 (1.14, 2.49)	2.06 (1.14, 3.73)	1.69 (0.99, 2.90)
Screening is efficacious is considered in decision to use PSA test	246 (24.5)	6.56 (2.99, 14.39)	5.76 (2.02, 16.40)	7.44 (2.23, 24.88)

<sup>a</sup>Includes those who routinely offer and recommend the PSA test for all asymptomatic patients (regardless of whether the patient asks) and those who offer and recommend PSA taking into account individual risks and other factors.

<sup>b</sup>AOR, adjusted odds ratio. Models control for demographic variables listed in table, physician race, practice location and setting, and number of patients seen weekly (continuous).



**Table 2**

Factors that family medicine and internal medicine primary care physicians consider in the decision to recommend the PSA test, DocStyles 2016.

	Family medicine vs internal medicine (reference group)
Dependent variables: consideration of the following in the decision to use PSA test...	AOR <sup>a</sup> (95% CI)
The patient has a family history of prostate cancer.	1.35 (1.00, 1.84)
Patient requested the PSA test.	1.54 (1.15, 2.07)
The patient is older.	10.91 (0.69, 1.22)
The patient is an African American male.	1.06 (0.81, 1.40)
Screening is efficacious.	1.02 (0.75, 1.40)
The benefits of PSA tests outweigh the limitations.	1.06 (0.80, 1.39)
I was trained to recommend the PSA test for prostate cancer screening.	1.23 (0.93, 1.64)
I am concerned about liability if a PSA test is not performed and prostate cancer is later detected.	1.16 (0.77, 1.58)
Other providers in my community use PSA tests for prostate cancer screening.	1.11 (0.77, 1.58)

There are no missing data; N = 1033 for each regression model.

<sup>a</sup>AOR, adjusted odds ratio. Models control for demographic variables listed in table, physician race, practice location and setting, and number of patients seen weekly (continuous).