

**BRIEF REPORT**

# Prostate-Specific Antigen Testing Initiation and Shared Decision-Making: Findings from the 2000 and 2015 National Health Interview Surveys

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**Purposes:** Despite recommendations against prostate cancer screening with prostate-specific antigen (PSA) tests, about one-fourth of men age  $\geq 40$  years received PSA tests in 2015. This study aimed to answer 3 questions for men who had a PSA test in the past year: (1) What percentage of these men received the test first suggested by physicians? (2) What factors were associated with physician-initiated PSA testing (PIPT) versus patient/someone else-initiated testing? (3) What percentage of patients ever had shared decision-making when tests were initiated by physicians?

**Methods:** We analyzed the 2000 and 2015 National Health Interview Survey data. We calculated age-standardized prevalence of PIPT for both years. For 2015, we used logistic regression to calculate adjusted prevalence ratios for PIPT. We also calculated the prevalence of ever discussing both advantages and disadvantages.

**Results:** The age-standardized prevalence of PIPT was significantly higher in 2015 (84.9%) than in 2000 (72.3%). In 2015, nearly 90% of PSA screenings for men aged  $\geq 70$  years were suggested by physicians. PIPT was positively associated with 2 or more comorbid conditions and number of patient visits to the doctor. Less than one-third of men reported they had ever participated in a discussion of advantages and disadvantages of PSA testing.

**Conclusions:** The majority of men who had PSA testing in the past year reported that their physicians were the first to suggest testing, including men aged  $\geq 70$  years. Our study also points to the challenges and needs in conducting shared decision-making before PSA testing in clinical practice. (J Am Board Fam Med 2018;31:658–662.)

**Keywords:** Decision Making, Early Detection of Cancer, Logistic Regression, Prevalence, Prostate Cancer, Prostate-Specific Antigen

Despite recommendations against prostate cancer screening with prostate-specific antigen (PSA) tests, approximately one-fourth of men age  $\geq 40$  years received PSA tests in 2015.<sup>1</sup> Many organizations, including the US Preventive Task Force (USPSTF), recommend that health care providers

and their patients use shared decision-making (SDM), including discussion of benefits and harms of the test, before ordering it.<sup>1</sup> This study aimed to answer 3 questions for men who had a PSA test in the past year: (1) What percentage of these men received the test first suggested by physicians? (2) What factors were associated with physician-

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**Table 1. Age-Standardized\* Prevalence of Physician-Initiated Prostate-Specific Antigen Testing by Sociodemographic and Screening-Related Factors Among Men Aged 40 Years and Older Who Had the Test in the Past Year, National Health Interview Survey, 2000 and 2015**

	2000				2015			P value <sup>‡</sup> (2015 vs 2000)
	N <sup>†</sup>	%	95% CI		N <sup>†</sup>	%	95% CI	
<b>Total</b>	<b>1642</b>	<b>72.3</b>	<b>69.0</b>	<b>75.4</b>	<b>2018</b>	<b>84.9</b>	<b>82.0–87.4</b>	<.01
<b>Age, crude estimates</b>								
40 to 54 years	462	66.1	60.7	71.1	380	83.2	78.2–87.2	<.01
55 to 69 years	707	76.2	72.4	79.7	1029	85.5	82.5–88.1	<.01
70+ years	473	85.4	81.2	88.7	609	89.3	85.2–92.4	.13
<b>Race</b>								
White	1375	72.9	69.3	76.2	1692	84.6	81.4–87.3	<.01
Black	189	72.7	64.3	79.7	243	87.3	79.0–92.7	<.01
Others	78	71.0 <sup>§</sup>	58.6	80.9	83	87.1	75.7–93.6	.03
<b>Ethnicity</b>								
Hispanic	132	60.9	51.0	70.0	140	85.2	75.3–91.5	<.01
Non-Hispanic	1510	73.0	69.5	76.2	1878	84.9	81.9–87.5	<.01
<b>Region</b>								
Northeast	325	76.8	71.0	81.8	346	81.7	72.6–88.3	.31
Midwest	379	67.5	61.4	73.1	441	86.3	79.2–91.2	<.01
West	634	74.0	67.6	79.4	745	86.0	82.1–89.2	<.01
South	304	70.5	63.0	77.0	486	83.8	76.6–89.1	.01
<b>Born in United States</b>								
Yes	1489	73.1	69.6	76.4	1792	85.7	82.6–88.3	<.01
No	146	62.1	53.1	70.2	224	81.7	73.9–87.5	<.01
<b>Education</b>								
Less than high school	273	63.0	53.9	71.3	184	88.8 <sup>§</sup>	74.2–95.6	<.01
High school graduate	431	74.7	67.6	80.6	483	83.4	75.3–89.2	.07
Some college	416	73.6	68.1	78.5	554	85.7	80.1–89.9	<.01
College graduate	510	69.3	64.1	74.1	794	84.3	79.9–88.0	<.01
<b>Marital status</b>								
Married or living with partner	1155	71.6	67.9	75.0	1339	85.2	82.0–88.0	<.01
Widowed, divorced, or separated	357	74.5	66.8	80.9	503	81.9	74.3–87.7	.13
Never married	126	75.9	66.4	83.3	174	81.1	70.1–88.7	.41
<b>Currently employed</b>								
No	822	79.2	71.4	85.3	1067	90.1	85.9–93.2	.01
Yes	820	69.7	65.4	73.7	949	84.0	80.0–87.3	<.01
<b>Poverty threshold, %</b>								
<200	339	80.0	70.1	87.2	378	87.8	81.8–92.0	.12
200 to 299	283	68.2	60.5	75.1	308	88.5	79.5–93.8	<.01
300 to 399	219	74.8	66.9	81.3	257	82.3	72.3–89.2	.19
400 to 499	189	70.8	62.9	77.7	229	82.4	73.3–88.8	.03
500 and more	612	69.8	64.8	74.4	846	84.5	80.0–88.1	<.01
<b>Usual source of medical care</b>								
Yes	1604	73.0	69.7	76.1	1971	85.0	82.0–87.5	<.01
No	38	41.9 <sup>§</sup>	27.4	58.0	46	81.8 <sup>§</sup>	63.3–92.1	<.01
<b>Health insurance</b>								
Uninsured/Medicaid	106	82.2 <sup>§</sup>	68.7	90.7	144	83.6	73.1–90.5	.85
Private/Military/Other	1531	71.9	68.5	75.1	1869	85.0	82.0–87.5	<.01

*Continued*

**Table 1. Continued**

	2000			2015			P value <sup>‡</sup> (2015 vs 2000)	
	N <sup>†</sup>	%	95% CI	N <sup>†</sup>	%	95% CI		
<b>Number of doctor visits in the past year</b>								
1	242	71.3	63.8	77.7	298	73.1	64.7–80.1	.73
2	522	67.1	61.3	72.4	681	86.4	81.9–89.9	<.01
3+	878	76.3	72.1	80.1	1039	89.4	85.8–92.2	<.01
<b>Family history of prostate cancer</b>								
No	1517	73.2	69.8	76.3	1806	87.1	84.6–89.2	<.01
Yes	125	64.8	55.7	72.9	212	68.6 <sup>§</sup>	56.9–78.2	.59
<b>Cancer, excluding prostate and nonmelanoma skin</b>								
No	1534	72.2	69.0	75.2	1820	85.0	82.0–87.5	<.01
Yes	106	75.0 <sup>§</sup>	58.8	86.3	197	83.2 <sup>§</sup>	67.1–92.3	.39
<b>Comorbidity<sup>  </sup></b>								
None	1326	71.4	68.1	74.5	1608	84.9	81.8–87.6	<.01
1 disease	279	79.7	70.7	86.5	339	81.5 <sup>§</sup>	67.0–90.5	.80
2+ diseases	36	82.9 <sup>§</sup>	67.9	91.8	71	97.2	91.1–99.2	.02
<b>Reported health status</b>								
Excellent/very good	900	72.0	68.0	75.7	1093	83.8	79.8–87.1	<.01
Good/fair or poor	741	72.1	66.8	76.8	925	86.5	82.8–89.5	<.01
<b>Had colorectal cancer screening</b>								
Yes	805	72.6	68.7	76.3	426	83.4	78.3–87.5	<.01
No	824	70.7	65.3	75.6	1588	87.7	84.1–90.6	<.01

\*Results for all variables except age were age standardized to the age distribution of the 2000 standard population.

<sup>†</sup>Number may differ from 1646 for 2000 National Health Interview Survey and 2024 for 2015 NHIS because of “don’t know,” refused, or missing responses.

<sup>‡</sup>P value is calculated by *t* test from the contrast statement of PROC DESCRIPT procedure.

<sup>§</sup>Estimates may not be reliable as the confidence interval half width ≥10.

<sup>||</sup>Number of the following comorbidities (none, 1, 2, and more diseases): hypertension, stroke, diabetes, chronic heart, kidney, liver, and lung diseases.

CI, confidential interval.

initiated PSA testing (PIPT) versus patient/ someone else-initiated testing? (3) What percentage of patients ever had SDM when tests were initiated by physicians?

## Methods

We analyzed 2000 and 2015 National Health Interview Survey data. The overall National Health Interview Survey adult sample response rates were 72.1% (2000) and 55.2% (2015). Our analyses included male respondents aged ≥40 years who reported PSA testing as part of a routine examination in the past year and excluded men with PSA tests for other purposes or prostate cancer history. Our analyses included 1646 men from the year 2000 and 2024 men from 2015. We calculated age-standardized prevalence of PIPT for both years. For 2015, we used logistic regression to calculate adjusted prevalence ratios for PIPT. We also calculated the

prevalence of ever discussing both advantages and disadvantages. We used SUDAAN 10 software (RTI International, Research Triangle Park, NC) to account for the sampling design.

## Results

The age-standardized prevalence of PIPT was significantly higher in 2015 (84.9%) than in 2000 (72.3%) (*P* < .01). In 2015, among men aged ≥70 years who received a PSA screening test, nearly 90% reported that it was first suggested by a physician (Table 1). PIPT was positively associated with 2 or more comorbid conditions and number of patient visits to the doctor, but inversely associated with prostate cancer family history (data not shown). Up to one-third of men who were screened reported that they had ever participated in a discussion of advantages and disadvantages of PSA testing (Table 2); SDM was slightly higher with

**Table 2. Prevalence of Ever Discussed Both Advantages and Disadvantages of Prostate-Specific Antigen Testing Among Men Aged 40 Years and Older Who Had the Test Within the Past Year, National Health Interview Survey, 2015**

	Ever Discussed Advantages and Disadvantages*			
	N†	%	95% CI	P value
<b>Total</b>	1955	31.0	28.1–34.1	
<b>Who first suggested the PSA test</b>				.061
Patient or someone else	287	25.1	19.0–32.3	
Physician	1668	32.0	28.9–35.4	
<b>40 to 54 years</b>	373	28.2	22.1–35.2	
<b>Who first suggested the PSA test</b>				.771
Patient or someone else	74	26.2	14.6–42.5	
Physician	299	28.6	21.8–36.5	
<b>55 to 69 years</b>	1003	34.8	30.8–39.1	
<b>Who first suggested the PSA test</b>				.006
Patient or someone else	148	23.6	16.1–33.2	
Physician	855	36.8	32.4–41.3	
<b>70+ years</b>	579	26.0	21.8–30.6	
<b>Who first suggested the PSA test</b>				.830
Patient or someone else	65	27.3	16.0–42.6	
Physician	514	25.8	21.3–30.8	

PSA, prostate-specific antigen testing; CI, confidential interval.

\*Status of “Ever discussed advantages and disadvantages” was assessed based on two survey questions: (1) Did a doctor ever talk with you about the advantages of the test?; and (2) Did a doctor ever talk with you about the disadvantages of the test.

†Number may differ from the total of 2024 because of “don’t know,” refused, or missing responses.

PIPT (32% vs 25% for initiation by the patient/ someone else), but not significantly so ( $P = .06$ ).

## Discussion

In 2000 and 2015, more than 70% of men who underwent PSA testing in the past year reported that their physicians were the first to suggest testing. Conflicting recommendations regarding PSA testing might have contributed to that high prevalence.<sup>1</sup> Other factors might include physician beliefs about PSA screening effectiveness, perceived community standard of care, and malpractice concerns.<sup>2</sup> Medicare reimbursement for annual PSA testing might contribute to the willingness of physicians to propose or support testing.

PIPT is positively associated with 2 or more comorbid conditions and the number of patient encounters with clinicians. More patient encounters may increase a clinician’s opportunity to suggest the test. This study suggests that men with prostate cancer family history are more likely to first suggest PSA testing. In 2017, the US Preventive Task Force released draft recommendations,

instead of against screening among men of all ages, calling for individualized decision making after discussion of potential benefits and harms of PSA testing among men aged 55 years to 69 years.<sup>3</sup> In our study, more than two-thirds of men who were screened reported that they had never discussed advantages and disadvantages of PSA testing with physicians, a finding consistent with previous reports.<sup>4,5</sup> These results point to the challenges and needs in conducting SDM in clinical practice.

Limitations of our study include self-reported data (which may be less accurate than medical records), results that may not be representative of nonrespondents, and lack of details on the relationship to the patient when “someone else requested the test.”

To see this article online, please go to: <http://jabfm.org/content/31/4/658.full>.

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