

## RESEARCH LETTER

## The Effect of Lowering the Prostate-Specific Antigen Normal Cutoff on Referral Rates to Urology

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**Background:** Routine prostate cancer screening is controversial, yet the use of prostate-specific antigen (PSA) for screening is likely to continue. Our hospital laboratory decreased the cutoff for normal PSA to 2.5 ng/mL on July 2, 2007, based on the National Comprehensive Screening Network recommendations. The purpose of this study was to determine if referral rates to urology increased after this change.

**Methods:** We queried our electronic health records to obtain the number of total screening PSA and abnormal PSA and subsequent referrals to urology in the 20-month periods before and after the change in PSA cutoff.

**Results:** There was no significant difference between the percentage of total screening PSA that resulted in a referral to urology after the change than before (7 of 199 [3.5%] vs 8 of 113 [7.1%];  $P = .16$ ). The percentage of abnormal PSA (as defined in the respective time periods) that were referred to urology actually decreased after the change (7 of 29 [24.1%] vs 6 of 10 [60.0%];  $P = .04$ ); however, when considering only PSA >4.0 ng/mL in each time period, there was no difference in percentage of referrals between the 2 periods.

**Conclusions:** Contrary to expectations, lowering the cutoff for normal PSA did not increase referrals to urology. (J Am Board Fam Med 2012;25:927–929.)

**Keywords:** Cancer Screening, Prostate Cancer, Prostate-Specific Antigen

The use of prostate-specific antigen (PSA) for prostate cancer screening is controversial. Screening for prostate cancer does not improve overall mortality.<sup>1</sup> Prostate biopsy may have complications that outweigh potential benefits.<sup>2</sup> The US Preventive Services Task Force recommends against routine prostate cancer screening.<sup>3</sup> However, the use of PSA for screening is likely to continue.

In July 2007, the National Comprehensive Cancer Network<sup>4</sup> recommended that the cutoff for the normal PSA level be decreased from 4.0 to 2.5 ng/mL. Our laboratory adopted this recommendation on July 3, 2007. The purpose of this study was

to determine whether referrals to Urology increased after this change in reporting.

### Methods

This study was approved by the institutional review boards of University of Medicine and Dentistry of New Jersey–Robert Wood Johnson Medical School and CentraState Medical Center. Using our electronic health records, we identified men from our New Jersey residency practice who had screening PSA drawn between May 1, 2005, and September 3, 2009. For the periods of May 1, 2005, through July 2, 2007 (abnormal PSA >4.0 ng/mL), and July 3, 2007, through September 3, 2009 (abnormal PSA >2.5 ng/mL), we recorded the number of abnormal PSA value (as defined in the respective time periods) and subsequent Urology referrals. We also recorded the total number Urology referrals after screening PSA, regardless of PSA value, in each time period. Differences were analyzed using  $\chi^2$  statistics. A  $P$  value of less than .05 was considered significant.

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**Table 1. Screening Prostate-Specific Antigen (PSA) in the Preliminary and Follow-up Time Periods, Stratified by Range and Subsequent Referrals to Urology**

PSA Range, ng/mL	Referred to Urology (n)	Total Screening PSA in Range (n)	Percentage
Before change*			
0.0–2.5	2	99	2.0
2.6–4.0	0	4	0.0
>4.0	6	10	60.0
Total	8	113	7.1
After change†			
0.0–2.5	0	170	0.0
2.6–4.0	3	16	18.8
>4.0	4	13	30.8
Total	7	199	3.5

\*Abnormal PSA &gt;4.0 ng/mL.

†Abnormal PSA &gt;2.5 ng/mL.

## Results

A total of 113 and 199 screening PSA were drawn during the preliminary and follow-up time periods, respectively. Table 1 shows PSA stratified by range and subsequent Urology referrals. There was no significant difference between the percentage of total screening PSA that resulted in a referral to Urology during the follow-up period compared with the preliminary period (7 of 199 [3.5%] vs 8 of 113 [7.1%];  $P = .16$ ). The percentage of abnormal PSA values (as defined in the respective time periods) that were referred to Urology decreased during the follow-up period compared with the preliminary period (7 of 29 [24.1%] vs 6 of 10 [60.0%];  $P = .04$ ). However, when looking at only the subset of PSA values >4.0 ng/mL in the 2 time periods, there was no statistically significant difference in percentage of referrals to Urology during the follow-up period compared with the preliminary period (4 of 13 [30.8%] vs 6 of 10 [60.0%];  $P =$  not significant).

## Discussion

Contrary to our expectations, the percentage of patients referred to Urology after screening PSA did not differ between the 2 time periods, and the percentage of patients with abnormal PSA values (as defined in the respective time periods) who were referred to Urology decreased after the cutoff value for normal PSA was lowered to 2.5 ng/mL. However, when considering only the subset with PSA >4.0 ng/mL during the follow-up time period, there was no difference in the percentage of refer-

als. This finding suggests that physicians may have used PSA >4.0 ng/mL as the cutoff for abnormal after July 2, 2007, despite the change in reporting. We considered several other possible explanations for these findings. Given the ambiguity of the relationship of PSA to prostate cancer,<sup>5</sup> providers may have avoided using absolute cutoffs for PSA and considered other factors in referral decisions. In addition, the numbers of abnormal PSA were relatively small and thus susceptible to statistical fluctuations.

Prostate cancer screening is associated with a lower mortality from prostate cancer,<sup>1</sup> but many men will receive aggressive treatment for disease with a low likelihood of significant morbidity or mortality.<sup>5</sup> Potential overtreatment is significantly increased with lower PSA cutoffs.<sup>2</sup> Further research into provider views about prostate cancer screening and decision-making processes regarding abnormal PSA is needed to further evaluate the state of prostate cancer screening in the primary care community.

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## References

1. Schröder FH, Hugosson J, Roobol MJ, et al. Prostate-cancer mortality at 11 years follow-up. *N Engl J Med* 2012;366:981–90.
2. Van Leeuwen PJ, Connolly D, Tammela TLJ, et al. Balancing harms and benefits of early detection of prostate cancer. *Cancer* 2010;116:4857–65.

3. U.S. Preventative Services Task Force. Recommendation statement. Screening for prostate cancer. May 2012. Available at <http://www.uspreventiveservices.org/prostatecancerscreening.htm>. Accessed September 15, 2012.
4. National Comprehensive Cancer Network. Clinical practice guidelines in oncology. Prostate cancer early detection version 2.2012. Available at [http://www.nccn.org/professionals/physician\\_gls/pdf/prostate\\_detection.pdf](http://www.nccn.org/professionals/physician_gls/pdf/prostate_detection.pdf). Accessed September 20, 2012.
5. Shao YH, Albertsen PC, Roberts CB, et al. Risk profiles and treatment patterns among men diagnosed as having prostate cancer and a prostate-specific antigen level below 4.0 ng/mL. *Arch Intern Med* 2010;170:1256–61.