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## Racial/Ethnic Differences in Receipt of Pelvic Lymph Node Dissection among Men with Localized/Regional Prostate Cancer

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### Abstract

**Background**—Black and Hispanic men have a lower prostate cancer (PCa) survival than White men. This racial/ethnic survival gap has been partially explained by differences in tumor characteristics, stage at diagnosis, and disparities in receipt of definitive treatment. Another potential contributing factor is racial/ethnic differences in timely and accurate detection of lymph node metastases. A study was conducted to examine the association between race/ethnicity and receipt of pelvic lymph node dissection (PLND) among men with localized/regional PCa.

**Method**—Logistic regression was used to estimate the adjusted odds of receiving a PLND among men diagnosed (2000–2002) with PCa, who received a radical prostatectomy or a PLND without a radical prostatectomy and who were diagnosed in regions covered by the Surveillance, Epidemiology, and End Results database ( $n = 40,848$ ).

**Results**—Blacks were less likely to have received a PLND than Whites (odds ratio [OR] 0.91, 95% confidence interval [CI] 0.84–0.98). Stratifying by PCa grade revealed that Black men with well (OR 0.48, 95% CI 0.27–0.84) and poorly differentiated PCa (OR 0.73, 95% CI 0.60–0.89) were less likely to have received a PLND than their White counterparts, but racial differences were not found among men with moderately differentiated PCa (OR 0.96, 95% CI 0.88–1.05).

**Conclusion**—Among men with poorly differentiated prostate cancer, failure to receive a pelvic lymph node dissection has been associated with worse survival. Racial disparities in receipt of pelvic lymph node dissection, especially among men with poorly differentiated prostate cancer, may contribute to racial differences in prostate cancer survival.

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## Keywords

prostate; prostatic cancer; lymph node excision; African Americans; Hispanic Americans; European Continental Ancestry Group; SEER

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## Introduction

Prostate cancer is the most frequently diagnosed noncutaneous malignancy in American men. In 2010, there were 217,730 incident cases diagnosed and 32,050 deaths from prostate cancer (PCa) in the United States, accounting for 25% of all cancers diagnosed and 9.4% of cancer deaths in men in the United States.<sup>1</sup> Black and Hispanic men diagnosed with PCa have lower age and stage-adjusted cancer-specific survival than White men.<sup>2</sup> Survival differences between Black and White men with PCa have been accounted for, at least in part, by more advanced stage at diagnosis, differences in PCa characteristics, and treatment differences.<sup>3–4</sup>

Black and Hispanic men with PCa are less likely to receive definitive therapy (surgery, external beam radiation, brachytherapy) than White men.<sup>5–10</sup> and those not receiving definitive therapy, may receive less rigorous monitoring for cancer progression than their White counterparts.<sup>11</sup> Although the lower likelihood of receiving definitive therapy accounts for a substantial proportion of the disparity in survival<sup>4, 12</sup>, differences in survival between Black and White men persist even among those who receive definitive treatment.<sup>13</sup> Additional, hitherto unexplored factors may be contributing to racial differences in PCa survival.

Pelvic lymph node dissection (PLND) has been routinely performed at the time of radical prostatectomy to stage disease more accurately.<sup>14–16</sup> According to current guidelines from the National Comprehensive Cancer Network (NCCN)<sup>17</sup> and the American Urological Association (AUA)<sup>18</sup>, men with poorly differentiated PCa should receive PLND, as risk of nodal metastases is increased in this population. Men with lymph node metastases who receive adjuvant therapy have better prognosis than men who do not.<sup>19</sup> Furthermore, removal of cancerous lymph nodes may also be therapeutic.<sup>15, 20–21</sup> Systematic differences in the receipt of PLND could contribute to reported racial disparities in PCa survival. Little is known about racial/ethnic patterns of receipt of PLND among men with prostate cancer, especially among Hispanic and Asian men. The objective of this study was to determine if there are differences in the likelihood of receipt of PLND among White, Black, Hispanic, and Asian men diagnosed with clinically localized/regional PCa.

## Materials and Methods

### SEER Data Set

The study was conducted using data from men diagnosed between 2000 and 2002 with PCa, who received a radical prostatectomy or a PLND without a radical prostatectomy, and who were diagnosed in regions covered by the Surveillance, Epidemiology, and End Results (SEER) database. Although more recent data is available we elected to use this data set because of the significant change SEER made to their grading classification in 2003. Gleason Score 7 was moved from moderately differentiated to poorly differentiated prostate cancer grade. Men diagnosed with Gleason Score 8–10 PCa are, by every nomogram, classified as high risk; however, nomograms vary in the treatment of men diagnosed with Gleason score 6 or 7 PCa. They may be classified as intermediate or high risk based upon other characteristics that may or may not be available in SEER. The years 2000–2002 were

used because, unlike in subsequent cohorts, one can be sure that for this dataset, there would be universal agreement that men classified as high risk all had high risk disease.

Although the focus of the study was on receipt of PLND among men who received a radical prostatectomy, the small subset of men ( $n = 2,839$ ) who received a PLND without a radical prostatectomy were included to avoid confounding differences due to racial/ethnic differences in receipt of PLND with possible racial/ethnic differences in the rate at which radical prostatectomies are aborted, but men still receive a PLND. If we had not retained these men, any reported racial gaps in PLND receipt could have been inflated if men who had received a PLND, but whose surgery had been aborted, had been disproportionately Black. This dataset encompasses approximately 26% of the US population from 17 defined geographic regions, which include 9 states (Alaska, Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, New Mexico, and Utah) and 8 metropolitan areas (San Francisco-Oakland, Metro Detroit, Seattle-Puget Sound, Metro Atlanta, San Jose-Monterey, Los Angeles), rural Georgia, and greater California and is maintained by the National Cancer Institute. Within SEER, PCa grade was classified as well differentiated (Gleason score 2–4), moderately differentiated (Gleason score 5–7), and poorly differentiated (Gleason score 8–10).<sup>22</sup> Men were excluded if they had missing data on variables of interest: PCa grade, age at diagnosis, race/ethnicity, and PLND. Less than 4% of the population was excluded. This yielded a total sample of 40,848 men [76.7% White ( $n = 31,315$ ); 11.0% Black ( $n = 4,489$ ); 8.4% Hispanic ( $n = 3,435$ ); 3.9% Asian ( $n = 1,609$ )]. There were no significant racial/ethnic differences in exclusion.

The study population includes men who received a radical prostatectomy as their initial course of therapy and those who received a PLND but did not receive surgery. In the United States, both procedures are performed by urologists **only**. Therefore men are assumed to have been under the care of a urologist if they received either or both of these procedures.

## Statistical Analyses

Pearson's chi-square tests were used to evaluate the bivariate relationships between demographic and clinical and pathologic variables (race/ethnicity, marital status, age, PCa grade) and PLND receipt. Logistic regression was used to examine adjusted associations between race/ethnicity, marital status, age, and grade and PLND receipt, as well as the interaction between race/ethnicity and PCa grade and PLND receipt. Interaction effects were explored by separately fitting multivariate models stratified by grade (i.e. well differentiated, moderately differentiated, and poorly differentiated). All analyses were performed using Stata<sup>®</sup> Version 10 (StataCorp, College Station, Texas).

## Results

The mean age at diagnosis was 61 years. Seventy-seven percent ( $n = 31,262$ ) of the sample had received a PLND. Table 1 contains demographic and pathologic characteristics of the sample, stratified by race/ethnicity. Compared to White men, a lower proportion of Black men were married and a higher proportion were diagnosed at a younger age and presented with moderately or poorly differentiated PCa. Asian men, compared to the other racial/ethnic groups, had a higher proportion of men who were diagnosed 70 years of age and a higher proportion of men diagnosed with poorly differentiated PCa. Higher proportion of Hispanic men than White men was diagnosed with poorly differentiated PCa.

The bivariate associations between demographic and clinical pathologic characteristics and PLND receipt, stratified by race/ethnicity are presented in Table 2. A small but statistically significant difference was found between the overall unadjusted proportion of Black and Hispanic men receiving PLND, compared to White men (74.8% vs. 76.9%;  $p = 0.002$  and

74.9% vs. 76.9%  $p = 0.009$ , respectively). Among men diagnosed between 50–59 years of age, significantly lower proportions of Black (72.4%;  $p = 0.003$ ) and Hispanic men (70.5%;  $p < 0.001$ ), compared to White men (75.7%), received a PLND. Among married men, significantly lower proportions of Black (74.0%;  $p < 0.001$ ), Hispanic (74.6%;  $p = 0.002$ ) and Asian men (75.0%;  $p = 0.049$ ) received a PLND, compared to White men (77.3%). Among men diagnosed with well differentiated PCa, significantly lower proportions of Black (58.8%;  $p = 0.02$ ) and Asian men (50.0%;  $p = 0.02$ ) received a PLND, compared to White men (72.5%). Among men diagnosed with moderately differentiated PCa, significantly lower proportions of Black (73.4%;  $p = 0.04$ ) and Hispanic men (73.0%  $p = 0.02$ ) received a PLND, compared to White men (75.0%). Among men diagnosed with poorly differentiated PCa, a significantly lower proportion of Black men received a PLND, compared to White men (81.5% vs 85.7%;  $p = 0.001$ ).

Race/ethnicity, age, and PCa grade demonstrated significant associations with the likelihood of receipt of PLND (Table 3). After controlling for age, marital status, PCa grade, and SEER registry, Black men had lower odds (OR 0.91, 95% CI 0.84–0.98,  $p = 0.018$ ) and Hispanic or Asian men had equal odds of receipt of PLND, compared to White men. The odds of having received a PLND were lower for men aged 50–59 (OR 0.93, 95% CI 0.88–0.98,  $p = 0.005$ ) and higher for men aged 70–79 (OR 1.20, 95% CI 1.11–1.30,  $p < 0.001$ ) compared to men aged 60–69.

Further analyses of the relationship between race/ethnicity and receipt of PLND were performed to evaluate racial/ethnic differences within PCa grade categories (well, moderate and poorly differentiated PCa). No racial/ethnic differences in the odds of receipt of PLND were found among men with moderately differentiated PCa. However, among men with either well differentiated PCa or poorly differentiated PCa, the odds of having received PLND was lower for Black men compared to White men PLND (OR 0.48, 95% CI 0.27–0.84,  $p = 0.011$  and OR 0.73, 95% CI 0.60–0.89,  $p = 0.002$ , respectively) (Table 4).

## Discussion

Black men in this study were significantly less likely to receive a PLND compared to White men. Differences in the receipt of PLND were greatest among men with poorly differentiated PCa. This is an important finding because PLND has been routinely performed at radical prostatectomy to more accurately stage disease,<sup>14–16</sup> guide patient selection for adjuvant therapies, and may provide therapeutic benefit by removing cancerous lymph nodes.<sup>15, 20–21</sup> To this end, The National Comprehensive Cancer Network (NCCN) currently recommends PLND for men if their risk of lymph node metastasis exceeds 2% by current predictive nomograms.<sup>17</sup> Per the American Urological Association (AUA), PLND should be reserved for men with a higher risk of nodal involvement, defined as PSA  $\geq 10$  ng/mL or Gleason score  $\geq 7$ .<sup>18</sup> Therefore, based upon the NCCN and AUA criteria, PLND is indicated for men diagnosed with poorly differentiated PCa (Gleason score 8–10). Lower odds of receiving PLND among Black men with poorly differentiated PCa may contribute to PCa outcome disparities as this may result in a disproportionate failure to detect nodal metastases, a lower likelihood of receiving adjuvant therapy when warranted, and a loss of possible therapeutic benefit of PLND among Black men. This pattern might help account for the reports that Black men treated with radical prostatectomy are more likely to biochemically recur than White men treated with radical prostatectomy.<sup>13, 23–24</sup>

A significantly higher proportion of Hispanic and Asian men than White men in this study population were diagnosed with poorly differentiated PCa. This is consistent with previously published reports.<sup>6, 25–26</sup> Hispanic and Asian men were less likely to receive a PLND compared to White men; however, the differences were not statistically significant. The lack

of statistical significance may be secondary to sample size. Further research is needed to determine whether or not the differences in the receipt of PLND are clinically significant in that they impact survival for Hispanic and Asian men.

PLND can be omitted in men with low risk of lymph node metastases.<sup>27-28</sup> Among men with well differentiated PCa, White men were significantly more likely to have received PLND than Black men. This raises the possibility that White men may have received PLNDs when they were not clinically warranted. Further research is required to understand whether the differences in receipt of PLND among Black and White men diagnosed with low risk PCa is the result of under-staging of Black men, over-staging of White men, or both.

Among men with moderately differentiated PCa, there were no significant racial differences in receipt of PLND. This may be an artifact of the composition of the moderate risk group which ranged considerably with respect to risk for nodal metastases. One would expect that even within the moderate risk group that, on average, White men had lower risk disease than Black men.<sup>29,30</sup> Because of this, an additional main effect of disease risk may have obscured racial differences in PLND that might have been found had we truly been able to compare Blacks and Whites with equal disease. In fact, given that Black men in this category likely had higher risk disease than white men in this category they should have had higher odds of receiving a PLND compared to White men, instead of equal or slightly lower odds of receiving a PLND.

The observed racial differences in the receipt of PLND follow a pattern similar to other racial/ethnic disparities in PCa treatment. Several studies have revealed disparities in receipt of definitive therapy between Black and White men, and that these disparities are greatest among men with poorly differentiated PCa.<sup>6-10</sup> The disparity in receipt of definitive treatment may be due to unequal access to health care, differences in patient preferences, greater likelihood of having comorbid conditions, lower trust in the medical system among Blacks than Whites, and bias among healthcare providers.<sup>7</sup> These factors are less plausible explanations for racial/ethnic differences in receipt of PLND. All the men whose data were included in the present study had been diagnosed with PCa, were under the care of a urologist, and had opted for a surgical intervention that had been deemed medically appropriate by their health care provider. Consequently, racial differences in access to care, patient preferences, and comorbid conditions are unlikely to have contributed to racial differences in receipt of PLND. The decision regarding whether to perform PLND at the time of radical prostatectomy would seem to be largely at the surgeon's discretion.

The idea that provider treatment decisions contribute to systemic inequalities in medical care can be difficult to come to terms with given the historical commitment of the medical establishment to principles of fairness, equity, and distributive justice.<sup>31</sup> However, several decades of basic behavioral research has demonstrated that interpersonal perceptions, judgment, decision-making and behavior can be biased when targets are racial or ethnic minorities.<sup>32</sup> Medical decision-making in general, and cancer treatment decision-making, in particular, may not be an exception. For example, Griggs et al. reported a systematic difference in the dosing of chemotherapy, with Black, and overweight and obese women receiving relatively lower initial adjuvant chemotherapy dose proportion and dose intensity, even after controlling for clinical factors, treatment site, and payer factors as possible explanations.<sup>33</sup>

### Study Limitations and Future Directions

Several limitations should be considered when interpreting the results of the current study. It is possible that racial differences in PLND receipt between 2000 and 2002 would not be

found today. Replication with a more recent cohort is needed. This said, it is still useful to understand disparities in treatment over the past 10–15 years in order to better account for present-day disparities in PCa mortality. Also, for the study period (2000 to 2002), SEER lacks PSA and clinical stage data, which both factor into the recommendation for PLND according to NCCN and AUA guidelines.<sup>17–18</sup> However, Blacks, on average, have greater PSA values<sup>29</sup> and tumor volumes<sup>30</sup> at diagnosis than White men. Therefore, one would expect a higher percentage of Black than White men to have received PLND based on PSA and clinical stage criteria. Although with the present dataset it was not possible to isolate and test whether there were racial/ethnic differences in receipt of PLND among men with Gleason score 7 disease. This would be warranted in future research as PLND may be of benefit to this group as well.<sup>18</sup>

In addition, the effect of socioeconomic status, co-morbidity or insurance status<sup>34</sup> could not be examined and are known to play a role in PCa treatment. Finally, differences in the facility where patients were treated could not be controlled. It is conceivable that Blacks are less likely to receive PLND because they receive care at poorer quality facilities, including facilities where they are less likely to be treated by a board certified urologist or fellowship trained urologic oncologist. Few studies have examined this possibility; in one study addressing the question, the likelihood of being treated in a facility with at least one board certified urologist did not differ as a function of race.<sup>35</sup>

Future research should inquire into the causes, processes and consequences of racial disparities in the receipt of PLND among men diagnosed with poorly differentiated PCa. Basic behavioral research on intergroup relations could serve as the basis for a number of hypotheses. First, this research has demonstrated that people are more likely to provide resources and be willing to help members of their racial ingroup than members of outgroups.<sup>36</sup> This tendency is strongest when people can rationalize the decision not to help.<sup>37</sup> PLND has two costs from the perspective of the surgeon: time and risk of complications.<sup>14</sup> Physicians may be more willing to expend resources on patients who they identify as belonging to their social group than an outgroup. Furthermore, there are plausible ways that a physician could rationalize such a decision. One such rationalization might be based on the perception that Blacks are at increased risk of complications from PLND. Human cognition tends to over-estimate the frequency with which unusual events are associated with minority groups (i.e., illusory correlation).<sup>38</sup> Physicians may perceive that Blacks are at increased risk for PLND complications when in fact they are not. Another (not mutually exclusive) possibility is that physicians are more inclined to avoid discretionary procedures with complication risks when their patient is a member of a stigmatized racial group in order to avoid the prospect of having to interact with this person (and their family) around the issue of a complication. Inter-racial interaction may be anxiety-provoking for the majority group and a dominant response is to avoid these interactions.<sup>39</sup>

Differential treatment of White and Black patients may be motivated by non-conscious attitudes and stereotypes. Substantial evidence demonstrates that the majority of Whites<sup>40–41</sup> and even a substantial proportion of minorities<sup>42–43</sup> hold implicit negative attitudes toward minority groups and that these attitudes can be associated with biases in behavior.<sup>44–44</sup> Two studies have demonstrated that non-Black physicians hold stronger associations between negative attributes and Blacks than negative attributes and Whites.<sup>45–46</sup> In one study, physicians read vignettes about patients with symptoms of coronary artery disease and physicians were disproportionately less likely to recommend thrombolysis to Black compared to White patients. Greater anti-Black implicit bias, as assessed, via the Implicit Associations Test (IAT) was associated with lower likelihood of recommending thrombolysis to Black patients.<sup>45</sup> Future research might investigate whether implicit racial

bias is associated with physician recommendations for prostate cancer treatment and decision-making regarding PLND.

In sum, research is needed to both replicate the racial/ethnic differences in receipt of PLND found in the 2000–2002 SEER sample in data that include more variables, such as comorbid conditions, socioeconomic status, health care coverage status, and characteristics of the facilities where patients are treated, to systematically examine why there might be Black–White differences in receipt of PLND.

## Conclusion

To our knowledge, racial/ethnic disparities in the receipt of PLND among men with poorly differentiated PCa have not been previously reported. The relative lower likelihood of receipt of PLND observed for Black men with high risk disease may contribute to less timely and/or appropriate receipt of adjuvant therapy for lymph node metastatic cancer and the failure to receive any possible therapeutic benefit derived from removal of cancerous lymph nodes. Either deficiency in treatment could contribute to the documented differences in PCa survival between Black and White men. Future research should examine whether basic biases in perception, judgment and decision-making that commonly emerge in inter-racial interactions contribute to the reported differences in receipt of PLND among men undergoing prostatectomy.

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**Table 1**  
 Demographic and Pathologic Characteristics of the Sample, Stratified by Race/Ethnicity\*\*

Variables	Total	Black	Hispanic	White	Asian	P Value
N (%)	40,848	4,489 (10.99)	3,435 (8.41)	31,315 (76.66)	1,609 (3.94)	-
Married, %	80.43	66.74	79.74	82.11	87.38	<0.001
Age group, %						
<50 yrs	5.62	10.29	6.03	4.99	3.85	<0.001
50-59 yrs	34.77	38.43	30.31	35.04	28.9	
60-69 yrs	46.06	43.08	48.91	46.01	49.22	
70-79 yrs	13.12	7.95	14.53	13.47	17.71	
>80 yrs	0.43	0.25	0.23	0.49	0.31	
PCa Differentiation, %						
Well	1.91	1.51	2.68	1.91	1.49	<0.001
Moderately	79.35	78.21	78.2	79.97	72.72	
Poorly	18.74	20.27	19.13	18.12	25.79	

\*\* Chi-square analysis: pairwise comparisons between race/ethnicity groups for marital status, age category at diagnosis and PCa grade, were all significantly different at  $p < 0.001$ .

**Table 2**  
Receipt of PLND by Age, Marital Status, Registry Location, and Grade, Stratified by Race/Ethnicity

Variables	Total	Black	Hispanic	White	Asian	P Value
Overall	31,262 (76.53)	3,362 (74.89)	2,576 (74.99)	24,102 (76.97)	1,222 (75.95)	0.002 <sup>a</sup>
Age group						
<50 yrs	1,710 (74.51)	340 (73.59)	146 (70.53)	1,181 (75.51)	43 (69.35)	0.30
50–59 yrs	10,635 (74.88)	1,249 (72.41)	735 (70.61)	8,312 (75.76)	339 (72.90)	<0.001 <sup>b</sup>
60–69 yrs	14,477 (76.95)	1,470 (76.01)	1,283 (76.37)	11,105 (77.08)	619 (78.16)	0.56
70–79 yrs	4,334 (80.86)	298 (83.47)	408 (81.76)	3,409 (80.80)	219 (76.84)	0.18
>80 yrs	106 (56.89)	5 (45.45)	4 (50.0)	95 (62.09)	2 (40.0)	0.49
Marital status						
Married	25,193 (76.68)	2,218 (74.03)	2,045 (74.66)	19,875 (77.30)	1,055 (75.04)	<0.001 <sup>c</sup>
Not married	6,069 (75.91)	1,144 (76.63)	531 (76.29)	4,227 (75.44)	167 (82.27)	0.13
PCa Differentiation						
Well	546 (69.91)	40 (58.82)	61 (66.3)	433 (72.53)	12 (50.0)	0.01 <sup>d</sup>
Moderately	24,212 (74.70)	2,580 (73.48)	1,963 (73.08)	18,805 (75.09)	864 (73.85)	0.03 <sup>e</sup>
Poorly	6,504 (84.95)	742 (81.54)	552 (84.02)	4,864 (85.72)	346 (83.37)	0.007 <sup>f</sup>

Chi-square analysis. Data are presented as No. (%) unless otherwise specified. Pairwise comparisons performed for race/ethnicity and receipt of PLND.

<sup>a</sup>Black versus White (p = 0.002); Hispanic versus White (p = 0.009); all other pairwise comparisons not significant.

<sup>b</sup>Black versus White (p = 0.003); Hispanic versus White (p < 0.001); all other pairwise comparisons not significant.

<sup>c</sup>Black versus White (p < 0.001); Hispanic versus White (p = 0.002); White versus Asian (p = 0.049); all other pairwise comparisons not significant.

- <sup>d</sup>Black versus White (p = 0.02); Asian versus White (p = 0.02); all other pairwise comparisons not significant.
- <sup>e</sup>Black versus White (p = 0.04); Hispanic versus White (p = 0.02); all other pairwise comparisons not significant.
- <sup>f</sup>Black versus White (p = 0.001); all other pairwise comparisons not significant.

**Table 3**

Multivariate Model of Likelihood of Having Received a PLND \*\*

	OR (95% CI)	P Value
Race/ethnicity		
White	Reference 1.0	
Black	0.91 (0.84–0.98)	0.02
Hispanic	1.01 (0.92–1.09)	0.86
Asian	.998 (0.88–1.13)	0.97
Age		
<50	0.91 (0.82–1.003)	0.06
50–59	0.93 (0.88–0.98)	0.005
60–69	Reference 1.0	
70–79	1.20 (1.11–1.30)	<0.001
>80	.410 (0.30–0.56)	<0.001
Marital Status		
Not married	Reference 1.0	
Married	1.01 (0.95–1.06)	0.93
PCa Differentiation		
Well	0.77 (0.66–0.90)	0.001
Moderately	Reference 1.0	
Poorly	1.86 (1.74–2.0)	<0.001

\*\* Logistic regression model was adjusted for race/ethnicity, age category at diagnosis, marital status, PCa grade, and SEER registry (data not shown).

**Table 4**Adjusted Odds of Having Received a PLND as a Function of Race/ethnicity, Stratified by Grade <sup>\*\*</sup>

	OR (95% CI)	P Value
Model I – Well Differentiated		
White	Reference 1.0	
Black	0.48 (0.27–0.84)	0.01
Hispanic	0.74 (0.44–1.23)	0.24
Asian	0.54 (0.21–1.39)	0.20
Model II – Moderately Differentiated		
White	Reference 1.0	
Black	0.96 (0.88–1.05)	0.35
Hispanic	1.04 (0.94–1.14)	0.48
Asian	1.03 (0.90–1.19)	0.65
Model III – Poorly Differentiated		
White	Reference 1.0	
Black	0.73 (0.60–0.89)	0.002
Hispanic	0.88 (0.70–1.12)	0.30
Asian	0.91 (0.67–1.24)	0.56

<sup>\*\*</sup>

Three independent logistic regression models were created that included only the men diagnosed with the specific PCa grade of interest. All models were adjusted for race/ethnicity, marital status, age category at diagnosis, and SEER registry. Whites were the referent group in all models.