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Scientific Article

# Sociodemographic disparities in the utilization of proton therapy for prostate cancer at an urban academic center

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**Abstract**

**Purpose:** Despite increasing use, proton therapy (PT) remains a relatively limited resource. The purpose of this study was to assess clinical and demographic differences in PT use for prostate cancer compared to intensity modulated radiation therapy (IMRT) at a single institution.

**Methods and materials:** All patients with low- and intermediate-risk prostate cancer (N = 633) who underwent definitive radiation therapy between 2010 and 2015 were divided into PT (n = 508) and IMRT (n = 125) comparison groups and compared using $\chi^2$ and independent sample *t* tests. Univariable and multivariable logistic regression analyses were conducted to assess the associations between PT use and demographic, clinical, and treatment characteristics.

**Results:** The PT and IMRT cohorts varied by age, race, poverty, distance, treatment year, and treating physician. Patients who underwent IMRT were more likely to be older (mean age, 66 vs. 68 years), black (51% vs. 75%), and living in poverty or close to the facility (mean distance between residence and facility, 90 vs. 21 miles; $P < .05$). Prostate-specific antigen, prostate

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volume, and International Index of Erectile Function were significantly higher in the IMRT cohort ($P < .05$), but insurance type, risk group, tumor stage, Gleason score, and patient-reported urinary and bowel scores did not differ significantly ($P > .05$). Patients who underwent PT were more likely to receive hypofractionated therapy and less likely to receive androgen deprivation therapy ($P < .01$). On multivariable analysis, black (odds ratio [OR], 0.29; 95% confidence interval [CI], 0.15-0.57) and other race (OR, 0.42; 95% CI, 0.20-0.90); distance (OR, 1.14; 95% CI, 1.06-1.24); treatment years 2011 (OR, 4.87; 95% CI, 2.23-10.6), 2012 (OR, 8.27; 95% CI, 3.43-19.9), and 2014 (OR, 4.44; 95% CI, 1.94-10.2) relative to 2010; and a single treating physician (OR, 0.38; 95% CI, 0.18-0.81) relative to the reference physician with the highest rate of use were associated with PT use, whereas clinical factors such as prostate-specific antigen, prostate volume, International Index of Erectile Function, and androgen deprivation therapy were not.

**Conclusion:** Sociodemographic disparities exist in PT use for prostate cancer at an urban academic institution. Further investigation of potential barriers to access is warranted to ensure equitable distribution across all demographic groups.



## Introduction

Intensity modulated radiation therapy (IMRT) and proton therapy (PT) are external beam radiation modalities used in the definitive treatment of localized prostate cancer. Although IMRT accounts for more than 80% of all prostate cancer radiation treatment, in recent years PT use has rapidly gained momentum.[1,2] Prostate cancer is an appealing indication for PT given its unique physical dose deposition characteristics and resulting potential to escalate target dose and/or decrease normal tissue irradiation.[3,4] However, as of 2016, access to this advanced radiation technology remains limited to just over 20 proton centers nationwide and several dozen globally, and the definitive treatment of localized prostate cancer may be as much as 70% more expensive than IMRT in some markets.[2] Although it remains unclear whether PT offers a significant and clinically meaningful benefit to justify this increased cost,[5,6] its reputation for reduced low and intermediate integral doses and popularity among "proton-seekers" make it a highly desired and sought-after resource.

Despite the growing use of PT for prostate cancer, certain populations may differ in their access to this advanced technology. A recent National Cancer Database study of more than 187,000 men with prostate cancer demonstrated that racial disparities exist in PT use, despite twice as many patients undergoing PT in 2012 compared with 2004.[7] Similarly, a population-based database analysis of more than 27,000 Medicare beneficiaries with prostate cancer reported that patients who received PT were younger, healthier, from more affluent areas, and more likely to travel substantial distances than patients who received IMRT.[2] Thus, the adoption pattern of PT may reflect a tiered system of access to advanced technologies in cancer care whereby certain demographic groups may be more likely to access such care. Because health care resource use can be used as a measure of access to care,[8] analysis of patterns of PT allocation presents such an opportunity. With proton facilities continuing to emerge, it is necessary to understand the patterns of care and potential barriers that exist in equitable access to PT. Whether observed population-based disparities persist at an institutional level, an acknowledged limitation of comparative effectiveness reports,[7] is unclear. The purpose of our study was to assess the clinical and demographic differences in the use of PT for prostate cancer compared with IMRT at a single, urban, academic institution.

## Methods and materials

We conducted an institutional review board–approved retrospective analysis of patients with prostate cancer who were treated with definitive external beam radiation therapy with curative intent at a single facility between January 2010 and December 2015. Existing medical databases and electronic medical records were used to identify all patients (N = 633) who were treated with histologically confirmed, non-metastatic, low- and intermediate-risk adenocarcinoma of the prostate in standard fractionation (79.2 Gy relative biological effectiveness [RBE] in 1.8 Gy RBE fractions) or mild hypofractionation (70 Gy RBE in 2.5 Gy RBE fractions).

Demographic characteristics were collected, including age, race, socioeconomic status, distance in miles from home address to the radiation facility, as well as primary insurance, primary treating radiation oncologist, and treatment year. Racial groups included white, black, Asian, other, and unknown; the Asian and unknown groups were combined with the other group given the small numbers in these cohorts. The federal definition for

residing in poverty as based on the geocoded census tract was used as a surrogate for socioeconomic status.[9] Primary insurance type was classified as either private or non-private, which included Medicare and Medicaid. Patients without insurance or a home address (eg, post office box) were excluded from the study cohort.

Pretreatment prostate-specific antigen (PSA); clinical tumor stage; Gleason score; D'Amico risk stratification group[10]; patient-reported outcomes using the International Prostate Symptom Score (IPSS), International Index of Erectile Function (IIEF), and Expanded Prostate Cancer Index Composite bowel function and bother scores; and treatment dates and modality (ie, IMRT and/or PT) were recorded. Patients who were prescribed combined modality (PT and IMRT due to planning constraints) at initial intent were included only in the PT cohort. The decision to treat with IMRT or PT was based on clinical factors, including oncologic and anatomic suitability for each modality, patient preference, and insurance coverage, as assessed initially by the treating physician and then by a multidisciplinary triage committee, which rendered a final decision regarding suitability.[11]

## Statistical considerations

The primary objective was to compare the characteristics of patients with low- and intermediate-risk prostate cancer who underwent PT and IMRT at our institution. Descriptive statistics were computed for the overall cohort, and PT and IMRT groups then were compared using the $\chi^2$ test for categorical variables and the Student *t* test for continuous variables. All *P* values were two-sided.

Univariable logistic regression was used to evaluate the relationship between the clinical and demographic characteristics for the binary outcome variable with PT use coded as 1 and IMRT as 0. Multivariable logistic regression models were constructed using variables that were significant in univariable analysis. Odds ratios (ORs) were reported with 95% confidence intervals (CIs). A *P*-value $< .05$ was considered statistically significant.

The Markov Chain Monte Carlo multiple imputation procedure was used for missing data in prostate volume and IIEF (each with 27% missing) assuming missing at random and joint multivariate normal distribution. Patients with and without missing data did not differ in observed variables. Analyses were conducted using either STATA Version 14 (StataCorp, College Station, TX) or SAS Version 9.4 (SAS Institute, Cary, NC).

## Results

A total of 633 consecutive patients with low- and intermediate-risk prostate cancer were identified. Patients received either IMRT (125; 20%) or PT (508; 80%) during the study period. Demographic, clinical, and therapeutic characteristics for the entire cohort and comparative groups are summarized in Table 1. For the overall cohort, mean age ± standard deviation was 66.3 ± 7.2 years. In terms of race, 70%, 21%, and 9% of patients were white, black, and other, respectively; 45% had private insurance and 55% had non-private insurance. The median distance between residence and the facility was 23.3 miles (range, 1.1-2867 miles). Four physicians treated 93% of patients, with each treating between 19% and 28%. In terms of clinical characteristics, mean PSA and prostate volume were 6.4 ± 6.1 ng/mL and 42 ± 22.4 $cm^3$, respectively. Forty percent of patients had low-risk and 60% had intermediate-risk prostate cancer. Mean IPSS and IIEF were 8 and 18, respectively. Therapeutically, 21% received androgen deprivation and 71% received conventionally fractionated doses.

Demographically, the IMRT and PT cohorts varied significantly by mean age (, 68 vs. 66 years, respectively; $P < .004$), mean miles traveled to the facility (22 vs. 90 miles, $P = .002$), race, and socioeconomic status (Table 1). Of the PT cohort, 75%, 17%, and 8% were white, black, and other, respectively, compared with 51%, 38%, and 11%, respectively, in the IMRT cohort ($P < .001$). The mean percentages for residing in poverty were 9% and 13% for the PT and IMRT cohorts, respectively ($P < .001$). Clinically, mean PSA (8.1 vs. 6.0 ng/mL, $P < .001$), prostate volume (48 vs. 41 $cm^3$, $P < .001$), and IIEF (16 vs. 19, $P = .002$) differed significantly for IMRT and PT, respectively, but risk group, T stage, Gleason score, and mean IPSS and bowel summary scores did not. Therapeutically, more IMRT patients received concurrent androgen deprivation ($P = .011$) and conventionally fractionated doses ($P < .001$). The distribution of treating physician ($P = .018$) and treatment year ($P < .001$) differed significantly.

Table 2 shows the results of the uni- and multivariable analyses. On univariable analysis, all demographic variables that were assessed except insurance type were associated with less likelihood of undergoing PT including black or other race, increasing age or poverty, and decreasing distance to facility. Clinically, PSA, prostate volume, IIEF, and concurrent androgen deprivation were associated with PT use, but Gleason score, clinical T stage, risk group, IPSS, and bowel function and bother scores were not. Certain physicians (1, 2, and 4) were associated with less likelihood of PT use relative to physician 3. Treatment years 2011, 2012, and 2014 were associated, but 2013 and 2015 were not, relative to the 2010 treatment year.

On multivariable analysis, demographically, poverty (OR, 1.03; 95% CI, 0.92-1.14; $P = .605$) was no longer significantly associated with PT use, age (OR, 0.85; 95% CI, 0.71-1.01; $P = .067$) was not significant (although borderline) but black race (OR, 0.29; 95% CI, 0.15-0.57; $P < .001$), the other race category (OR, 0.42; 95% CI, 0.20-0.90; $P = .025$), and distance (OR, 1.14; 95% CI,

**Table 1** Overall cohort characteristics and comparison of proton therapy and IMRT cohorts

| Variable | Overall (N = 633) | Proton (n = 508) | IMRT (n = 125) | *P*-value[a] |
|---|---|---|---|---|
| Demographic | | | | |
| Age (years) | | | | |
| Mean ± SD | 66.3 ± 7.2 | 65.8 ± 7.0 | 68.0 ± 7.6 | .004 |
| Race | | | | |
| White (%) | 444 (70.1) | 380 (74.8) | 64 (51.2) | <.001 |
| Black (%) | 132 (20.9) | 85 (16.7) | 47 (37.6) | |
| Other (%) | 57 (9.0) | 43 (8.5) | 14 (11.2) | |
| Poverty[b] | | | | |
| Mean ± SD | 10.0 ± 11.8 | 9.2 ± 10.9 | 13.4 ± 14.5 | <.001 |
| Distance (miles) | | | | |
| Mean ± SD | 76.7 ± 226.4 | 90.2 ± 250.6 | 21.7 ± 24.7 | .002 |
| Primary Insurance | | | | |
| Private (%) | 286 (45.3) | 233 (46.0) | 53 (42.4) | .474 |
| Non-private (%) | 346 (54.7) | 274 (54.0) | 72 (57.6) | |
| Clinical | | | | |
| PSA | | | | |
| Mean ± SD | 6.4 ± 6.1 | 6.0 ± 3.0 | 8.1 ± 12.1 | <.001 |
| Gleason Score | | | | |
| 3 + 3 = 6 (%) | 264 (41.7) | 218 (42.9) | 46 (36.8) | .275 |
| 3 + 4 = 7 (%) | 264 (41.7) | 211 (41.5) | 53 (42.4) | |
| 4 + 3 = 7 (%) | 105 (16.6) | 79 (15.6) | 26 (20.8) | |
| Clinical Tumor (T) Stage | | | | |
| Missing (%) | 4 (0.6) | 4 (0.8) | 0 (0.0) | .432 |
| T1 (%) | 529 (83.6) | 421 (82.9) | 108 (86.4) | |
| T2 (%) | 100 (15.8) | 83 (16.3) | 17 (13.6) | |
| Risk Group | | | | |
| Low (%) | 250 (39.5) | 206 (40.6) | 44 (35.2) | .273 |
| Intermediate (%) | 383 (60.5) | 302 (59.4) | 81 (64.8) | |
| Prostate Volume (cc) | | | | |
| Mean ± SD | 42.0 ± 22.4 | 40.6 ± 19.0 | 47.9 ± 32.9 | .006 |
| IPSS | | | | |
| Mean ± SD | 7.8 ± 6.2 | 7.8 ± 6.2 | 7.7 ± 6.4 | .969 |
| IPSS QoL | | | | |
| Mean ± SD | 1.7 ± 1.4 | 1.6 ± 1.4 | 1.9 ± 1.3 | .276 |
| IIEF | | | | |
| Mean ± SD | 17.9 ± 6.8 | 18.5 ± 6.5 | 15.7 ± 7.5 | .002 |
| Bowel Bother[c] | | | | |
| Mean ± SD | 92.1 ± 9.4 | 91.9 ± 9.8 | 92.8 ± 7.1 | .597 |
| Bowel Function[c] | | | | |
| Mean ± SD | 93.6 ± 11.5 | 93.3 ± 12.1 | 95.2 ± 8.4 | .367 |
| Treatment | | | | |
| Androgen Deprivation | | | | |
| (%) | 130 (20.5) | 94 (18.5) | 36 (28.8) | .011 |
| Dose (Gy RBE) | | | | |
| 70 (%) | 183 (28.9) | 170 (33.5) | 13 (10.4) | <.001 |
| 79.2 (%) | 450 (71.1) | 338 (66.5) | 112 (89.6) | |
| Physician | | | | |
| 1 (%) | 146 (23.1) | 108 (21.3) | 38 (30.4) | .018 |
| 2 (%) | 122 (19.3) | 97 (19.1) | 25 (20.0) | |
| 3 (%) | 142 (22.4) | 127 (25.0) | 15 (12.0) | |
| 4 (%) | 177 (28.0) | 138 (27.2) | 39 (31.2) | |
| Other (%) | 46 (7.3) | 38 (7.5) | 8 (6.4) | |
| Treatment Year | | | | |
| 2010 (%) | 94 (14.8) | 61 (12.0) | 33 (26.4) | <.001 |
| 2011 (%) | 141 (22.3) | 126 (24.8) | 15 (12.0) | |
| 2012 (%) | 125 (19.7) | 115 (22.6) | 10 (8.0) | |

(*continued on next page*)

**Table 1** (*continued*)

| Variable | Overall (N = 633) | Proton (n = 508) | IMRT (n = 125) | *P*-value[a] |
|---|---|---|---|---|
| 2013 (%) | 118 (18.6) | 89 (17.5) | 29 (23.2) | |
| 2014 (%) | 89 (14.1) | 76 (15.0) | 13 (10.4) | |
| 2015 (%) | 66 (10.4) | 41 (8.1) | 25 (20.0) | |

IMRT, intensity modulated radiation therapy; IIEF, International Index of Erectile Function; IPSS, International Prostate Symptom Score; PSA, prostate-specific antigen; QoL, quality of life; RBE, relative biological effectiveness; SD, standard deviation.

[a] *P*-value is from the *t* test for continuous variables and the $\chi^2$ test for categorical variables.

[b] Geocoded census tract for the percentage of those residing below the federal poverty line.

[c] Bowel bother and function scores are from the Expanded Prostate Cancer Index Composite.

1.06-1.24; $P < .001$) remained associated (Fig 1). No clinical characteristics remained associated with PT use, including PSA (OR, 0.94; 95% CI, 0.88-1.01; $P = .076$), prostate volume (OR, 0.99; 95% CI, 0.98-1.00; $P = .064$), IIEF (OR, 1.01; 95% CI, 0.97-1.05; $P = .690$), and androgen deprivation (OR, 0.68; 95% CI, 0.39-1.19; $P = .178$). One physician (OR, 0.38; 95% CI, 0.18-0.81; $P = .012$) remained associated with less likelihood of PT use relative to the reference physician, whereas treatment years 2011 (OR, 4.87; 95% CI, 2.23-10.6; $P < .001$), 2012 (OR, 8.27; 95% CI, 3.43-19.9; $P < .001$), and 2014 (OR, 4.44; 95% CI, 1.94-10.2; $P < .001$) remained associated relative to treatment year 2010. Figure 2 shows the percentages of patients who underwent PT compared with IMRT for each treatment year.

## Discussion

In this study, we examined PT use in patients with low- and intermediate-risk prostate cancer to determine whether disparities noted in population level data similarly exist at a single, urban, academic institution with a diverse patient cohort. We found that at baseline, IMRT patients were significantly older, of black and other race, resided closer to the facility and more likely in poverty, had higher PSA and IIEF and larger prostate volume, were less likely to receive hypofractionated therapy, and were more likely to receive androgen deprivation therapy compared with those receiving PT. On multivariable analysis, only demographic characteristics such as race and residence distance from the facility, as well as treatment physician and year, remained associated with PT use, but clinical characteristics did not.

Our single-institution results thus confirm previously demonstrated disparate sociodemographic patterns of care in the use of PT nationally.[2,7] We found that race and distance remained significant determinants of PT use even after robust adjustments for demographic and clinical factors. Patients of black and other race were less likely to receive PT compared with patients of white race. A suggested explanation for this racial gap may be provider implicit bias, whereby patient race may influence provider decisions regarding treatment recommendations at the unconscious level.[7] One might expect that such disparities and bias would be less likely at a single institution with a standardized practice to consider most patients with low- and intermediate-risk prostate cancer to be eligible for PT; however, our findings suggest otherwise. Interestingly, only one physician on multivariable analysis was associated with decreased PT use compared with the reference physician with the highest use, which suggests some element of physician bias, although there was no difference with other physicians.

Despite no level 1 evidence demonstrating the clinical superiority of PT, we found that many patients opted to travel substantial distances (90 miles on average compared with 22 miles for IMRT patients) for their 6 to 9 weeks of daily treatment, similar to results from previous population-based studies. One study found that patients living closest to (<75 miles) and furthest from (>500 miles) their treatment facility were more likely to receive PT than patients residing between 75 and 500 miles away.[2] Many PT patients would have to commute long distances or relocate, potentially resulting in considerable out-of-pocket costs.[12] Thus, PT use may reflect inequitably distributed access to cancer care, with one level involving most patients who travel locally for cancer care and another level that can afford to travel nationally to obtain treatments that are perceived to be the best.[2] Moreover, it suggests that with such a limited number of PT facilities available, equalizing sociodemographic access to PT may be particularly challenging.

We also found that PT use increased over the first 3 years, which was likely related to increasing experience and capacity as a result of the commissioning of additional treatment rooms (up until the fifth and final room), improved operational efficiency, and the expansion of technological capabilities such as pencil beam scanning.[13] The years 2013 and 2015 were not associated with increased PT use relative to the 2010 reference. It is unclear if other factors, such as insurance payor changes and/or implementation of the prospective randomized trial to compare PT and IMRT, influenced these differences.[14]

**Table 2** Univariable and multivariable logistic regression models for undergoing proton therapy

| | Univariable (N = 349) | | Multivariable (N = 349) | |
|---|---|---|---|---|
| Variable | OR (95%CI) | *P*-value | OR (95%CI) | *P*-value |
| Age (years) | 0.96 (0.93-0.98) | .002 | 0.85 (0.71-1.01) | .067 |
| Race | | | | |
| Black | 0.30 (0.20-0.47) | <.001 | 0.29 (0.15-0.57) | <.001 |
| Other | 0.52 (0.27-1.00) | .049 | 0.42 (0.20-0.90) | .025 |
| White | Ref | - | - | |
| Poverty[a] | 0.97 (0.96-0.99) | <.001 | 1.03 (0.92-1.14) | .605 |
| Distance (miles) | 1.02 (1.01-1.02) | <.001 | 1.14 (1.06-1.24) | <.001 |
| Primary Insurance | | | | |
| Private | 1.16 (0.78-1.72) | .475 | NT | |
| Non-private | Ref | - | - | |
| PSA | 0.91 (0.85-0.96) | <.001 | 0.94 (0.88-1.01) | .076 |
| Gleason Score | | | | |
| 3+4=7 | 0.84 (0.54-1.30) | .436 | NT | |
| 4+3=7 | 0.64 (0.37-1.11) | .110 | NT | |
| 3+3=6 | Ref | - | - | |
| T Stage | | | | |
| T2 | 1.25 (0.71-2.20) | .433 | NT | |
| T1 | Ref | - | - | |
| Risk Group | | | | |
| Low | 1.26 (0.84-1.89) | .274 | NT | |
| Intermediate | Ref | - | - | |
| Prostate Volume (cc) | 0.99 (0.98-1.00) | .011 | 0.99 (0.98-1.00) | .064 |
| IPSS | 1.00 (0.97-1.03) | .968 | NT | |
| IPSS QoL | 0.89 (0.70-1.11) | .302 | NT | |
| IIEF | 1.04 (1.01-1.08) | .007 | 1.01 (0.97-1.05) | .690 |
| Bowel Bother[b] | 0.99 (0.95-1.03) | .596 | NT | |
| Bowel Function[b] | 0.98 (0.94-1.02) | .367 | NT | |
| Androgen Deprivation | | | | |
| Yes | 0.56 (0.36-0.88) | .011 | 0.68 (0.39-1.19) | .178 |
| No | Ref | - | - | |
| Physician | | | | |
| 1 | 0.34 (0.18-0.64) | .001 | 0.38 (0.18-0.81) | .012 |
| 2 | 0.46 (0.23-0.92) | .027 | 0.60 (0.26-1.36) | .218 |
| 4 | 0.42 (0.22-0.79) | .008 | 0.63 (0.30-1.35) | .2360 |
| Other | 0.56 (0.22-1.42) | .224 | 0.39 (0.14-1.13) | .082 |
| 3 | Ref | - | - | |
| Treatment Year | | | | |
| 2011 | 4.54 (2.30-8.99) | <.001 | 4.87 (2.23-10.6) | <.001 |
| 2012 | 6.22 (2.87-13.5) | <.001 | 8.27 (3.43-19.9) | <.001 |
| 2013 | 1.66 (0.91-3.01) | .095 | 1.65 (0.82-3.31) | .161 |
| 2014 | 3.16 (1.53-6.53) | .002 | 4.44 (1.94-10.2) | <.001 |
| 2015 | 0.89 (0.46-1.71) | .720 | 1.09 (0.52-2.29) | .821 |
| 2010 | Ref | - | - | |

CI, confidence interval; IIEF, International Index of Erectile Function; IPSS, International Prostate Symptom Score; NT, not tested; OR, odds ratio; PSA, prostate-specific antigen; QoL, quality of life; Ref, reference value; RBE, relative biological effectiveness.

[a] Geocoded census tract for the percentage of those residing below the federal poverty line.

[b] Bowel bother and function scores are from the Expanded Prostate Cancer Index Composite.

Because 2015 was the last year assessed, future follow-up is needed to determine whether this trend persists. Overuse of expensive health care technologies has been shown to be a principal driver of health disparities[15]; thus, an awareness of such patterns will be relevant with several more proton facilities in the construction or planning phase.[16] Furthermore, these disparities may not be unique to prostate cancer but also relevant to other

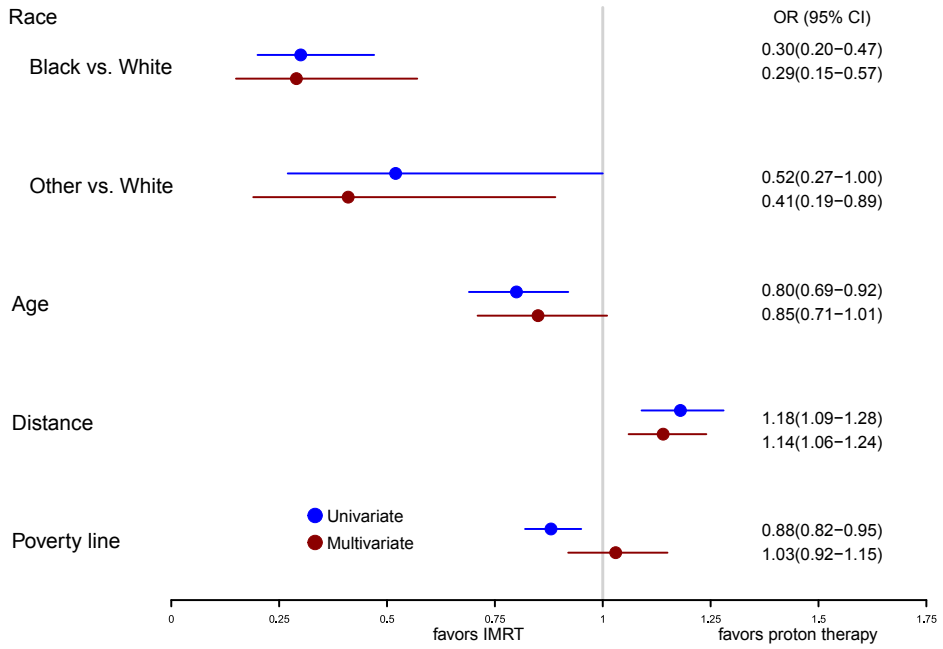


**Figure 1** Univariable and multivariable analysis of proton therapy use for low- and intermediate-risk prostate cancer by race, age, distance, and poverty.

clinical sites where PT is of increasing use and potential benefit.[17] Further research should assess whether similar disparities exist in these disease sites.

We did not find a significant association between insurance type and PT use, as has been previously reported, with one study noting an increasing trend for PT use among all patients except the uninsured and those using Medicaid.[7] However, we did not examine Medicare and Medicaid separately because both providers covered PT in this study cohort. Another limitation is that we did not investigate associations with referring physician and self-referral trends to assess how these influenced use. We also did not assess clinical trial enrollment because the vast majority of PT patients were enrolled in feasibility or non-randomized, phase 2 trials of conventionally fractionated or hypofractionated therapy in addition to the aforementioned randomized trial. Given known disparities in clinical trial enrollment of minorities,[18] it is unclear how this may have influenced the noted racial disparities.

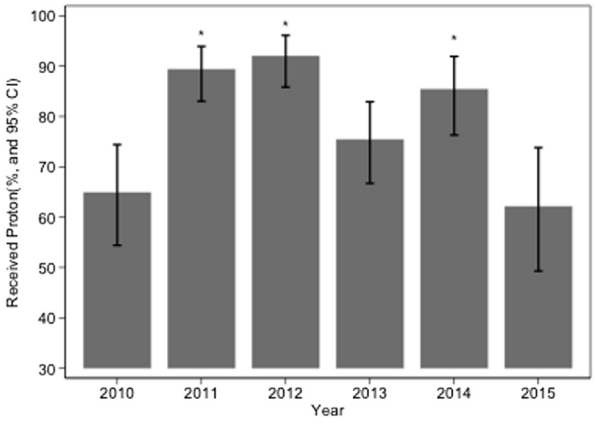


**Figure 2** Percentage use of proton therapy versus intensity modulated radiation therapy per treatment year (2010-2015) for low- and intermediate risk prostate cancer. *Significant difference and error bars represent the 95% confidence interval.

## Conclusion

Sociodemographic disparities exist in the use of PT when compared with IMRT for low- and intermediate-risk prostate cancer at a single, urban, academic institution. Further investigation is warranted to better understand potential barriers to access and to ensure equitable use across all demographic groups.

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