

Prostate Cancer 2

9:15 - 11:25am Thursday, 4th November, 2021

215 Prostate specific antigen volatility and the diagnosis of clinically significant prostate cancer.

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Abstract

Background: A prostate specific antigen (PSA) value of 4-10 mg/dL has limited specificity for detecting clinically significant prostate cancer. While increasing volatility in PSA measurements may be associated with benign processes, there are no established methods for quantifying variation in PSA values over time. The wealth of longitudinal clinical data in electronic health records provides an opportunity to evaluate longitudinal variations in PSA measurements.

Objective: We sought to evaluate whether pre-diagnosis PSA volatility was associated with diagnosis of clinically significant prostate cancer.

Methods: We identified patients diagnosed with localized prostate cancer in the Veterans Health Administration from 2010-2018. We abstracted all available PSA measurements in the 5 years prior to the date of prostate cancer diagnosis. We defined clinically significant prostate cancer as intermediate- or high-risk prostate cancer.

Outcome & statistical measurements: We measured the PSA volatility in several ways including the standard deviation, average real variability (ARV), ARV with time correction, and variance of the residuals from linear regression. We fit sequential logistic regression models to determine the odds of receiving a diagnosis of clinically significant prostate cancer after adjusting for relevant factors.

Results We identified 82,717 patients with a PSA measurement from 4-10 mg/dL diagnosed with localized prostate cancer. The average age at diagnosis was 66 years (IQR 62-70), and the average PSA at diagnosis was 6 md/dL (IQR 5 - 10). The average real variability was 1.13 mg/dL (IQR 0.0.73-1.93). Multiple analysis of PSA kinetics (PSA velocity) and variation (ARV, variance of residuals) were associated with the detection of clinically significant prostate cancer after adjusting for PSA at diagnosis. In fully adjusted models accounting for age, comorbidity, and PSA at diagnosis, the ARV was inversely associated with a diagnosis of clinically significant prostate cancer (OR 0.96, 95%CI 0.94 - 0.98).

Conclusions: Using longitudinal data from the largest integrated health care system, we demonstrate that variation in routine PSA measurements is associated with the diagnosis of clinically significant prostate cancer for patients with PSA values between 4-10 mg/dL. ARV is a novel and easily accessible way to evaluate PSA variability in patients being screened for prostate cancer.

178 Using The Care Assessment Need (CAN) Score To Estimate Life Expectancy In Men Diagnosed With Prostate Cancer In The Veterans Health Administration

Simon John Christoph Soerensen MD¹, I-Chun Thomas MS², Bogdana Schmidt MD MPH¹, Timothy Daskivich MD MS³, Ted A. Skolarus MD MPH⁴, Christian Jackson MS¹, Thomas F. Osborne MD², Glenn M. Chertow MD MPH¹, James D. Brooks MD¹, David Rehkopf ScD MPH¹, John T. Leppert MD MS¹

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Abstract

Objective: To determine if an automated electronic health record score can estimate intermediate-term life expectancy in men with prostate cancer to provide guideline concordant care.

Methods: We identified all men diagnosed with prostate cancer in 2013–2015 in the VHA. We abstracted the Care Assessment Needs (CAN) score (range: 0-99) calculated in the month prior to diagnosis, that was designed to estimate short-term risks of hospitalization and mortality. We fit unadjusted and multivariable Cox proportional hazards regression models to determine the association between the CAN score and overall survival among men with prostate cancer. We compared CAN score performance to two established comorbidity measures: The Charlson Comorbidity Index and Prostate Cancer Comorbidity Index (PCCI).

Results: Among 35,315 men, the CAN score correlated with overall stage, with mean scores of 46.5 (± 22.4), 58.0 (± 24.4), and 68.1 (± 24.3) in localized, locally advanced, and metastatic disease, respectively. In both unadjusted and adjusted models for prostate cancer risk, the CAN score was independently associated with survival (HR=1.23 95%CI 1.22-1.24 & adjusted HR=1.17 95%CI 1.16-1.18 per 5-unit change, respectively). The CAN score (overall C-Index 0.74) yielded better discrimination (AUC=0.76) than PCCI (AUC=0.65) or Charlson Comorbidity Index (AUC=0.66) for 5-year survival.

Conclusions: The CAN score is strongly associated with intermediate-term survival following a prostate cancer diagnosis. The CAN score is an example of how learning health care systems can implement multi-dimensional tools to provide fully automated life expectancy estimates to facilitate patient-centered cancer care.

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200 Long-term bowel and urinary health-related quality of life after primary and salvage radiation treatment for prostate cancer: results from the CaPSURE registry

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Abstract

Introduction and Objective: Radiotherapy (RT) for prostate cancer are associated with distinct treatment-related morbidity, primarily in domains of urinary and bowel health-related quality of life (HRQOL). However, few studies have reported on the long-term HRQOL after primary and salvage radiation treatment for prostate cancer. Therefore, we sought to report on the long-term HRQOL outcomes from a nationwide, longitudinal prostate cancer registry.

Methods: We identified men diagnosed with prostate cancer and treated with primary EBRT and also radical prostatectomy (RP) followed by adjuvant/salvage EBRT and from the UCSF Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) registry covering primarily community-based US urologic practices. The University of California, Los Angeles (UCLA), Prostate Cancer Index (PCI) was used to measure urinary and bowel function which yield a score of 0-100, with higher scores denoting better function. Self-reported questionnaires were completed at enrollment and every 6 to 12 months.

Results: In total, 2,841 men underwent primary RT with 2,170 (76.4%) and 671 (23.6%) had adjuvant/salvage RT. Median follow-up was 8.3 years (IQR 4.7-13.2). At enrollment, the mean (\pm SD) urinary function score was 90.9 (\pm 13.6) in the primary RT group and 74.5 (\pm 24.4) in the salvage RT group. The mean bowel function score was 86.6 (\pm 13.7) in the primary RT group and 87.2 (\pm 15.8) in those mean treated with salvage RT. At 12 years, the mean urinary function score decreased to 85.4 (\pm 20.2) and 67.4 (\pm 28.4) in the primary and salvage RT groups respectively. At 12 years, the mean bowel function score was unchanged in the primary RT group (86.5 ± 10.5) and reduced to $84.4 (\pm 20.4)$ in the salvage RT group.

Conclusions: Long term decline in HRQOL is observed in urinary function to a greater extent in salvage RT compared to primary RT, whereas changes in bowel function is not as pronounced. These findings are helpful regarding shared decision making for men being treated with RT for prostate cancer.

209 The long-term incidence of complications associated with radiotherapy for prostate cancer

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Abstract

Introduction and Objective: Radiotherapy (RT) for prostate cancer is associated with a distinct constellation of treatment-related complications and morbidities. However, few studies have reported the longer-term incidence of these treatment-related toxicities. Therefore, we sought to determine the incidence of complications associated with primary and salvage RT from the UCSF Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) registry.

Methods: We identified men diagnosed with prostate cancer from 1994 to 2017 and treated with primary RT and radical prostatectomy (RP) followed by adjuvant/salvage RT from CaPSURE, a nationwide, longitudinal observational study which includes 43 primarily community-based US urology practices. The database was queried for patient-reported and International Classification of Diseases, 9th revision/Common Procedural Terminology codes classified by the diagnosis and management of radiation cystitis, fistula, ureteral injury and urethral stricture disease.

Results: From a total of 15,335 men with a diagnosis of prostate cancer in CapSURE, 2,170 (76.4%) had primary RT and 671 (23.6%) had adjuvant/salvage RT. The median follow-up for the cohort was 8.3 years (IQR 4.7-13.2). In total, 393 (18.1%) men treated with primary RT group had a complication, and 129 (19.2%) men treated with salvage RT experienced any complication after RT. After primary RT, the most frequent complication was radiation cystitis (108, 4.9%) after a median of 3.1 years (0.9-7.3), urethral stricture (66, 3.0%) after a median of 3.0 years (IQR 1.3-6.7) and fistula (7, 0.3%) after a median of 3.5 years (IQR 2.6-9.2). The most frequent complication after salvage RT was radiation cystitis (41, 6.1%) after a median of 3.1 years (IQR 1.5-6.9), urethral stricture (31, 4.6%) after a median of 4.6 years (IQR 2.0-10.3) and fistula (2, 0.3%) after a median of 1.6 years (IQR 0.3-3.0).

Conclusions: RT for prostate cancer is associated with distinct treatment-related complications which can occur many years after treatment. These results may help men understand the long-term implications of their treatment decisions.

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UCSF Goldberg-Benioff Program in Translational Cancer Biology

228 External Validation of an Artificial Intelligence Algorithm for Prostate Cancer Gleason Grading and Tumor Quantification

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Abstract

Objectives: Prostate cancer treatment relies on accurate Gleason grading. Gleason scoring has high inter- and intra-rater variability, even among high-volume urologists. Deep learning on digital pathology has the potential to address these problems. We aimed to externally validate a deep learning algorithm's performance on prostate cancer identification and Gleason grading.

Materials and Methods: DeepDx Prostate (DeepBio, Seoul, South Korea) is an automated Gleason scoring system that was trained using 1133 prostate core needle biopsy images and validated on 700. We performed external validation using 150 whole mount prostatectomy specimens from which 500 (1mm²) tiles were created and evaluated by 2 urologists and the DeepDx algorithm to establish Gleason grade, amount of cancer, and percentage of Gleason pattern 4 and 5 in the tiles. The reference standard was established by consensus of two experienced urologists with a third expert to evaluate discordant cases. We defined the main metric as the agreement with the reference standard, measured using quadratic Cohen's kappa (k).

Results: The DeepDx algorithm achieved overall high agreement with the reference standard (k 0.79, 95% CI 0.75 - 0.82). It performed well at clinical decision thresholds benign vs malignant, (k 0.927), and clinically low risk (benign, GG1, or GG2) versus high risk (GG 3-5) disease (k 0.858). In evaluating benign and GG1 vs GG 2-5, the algorithm had less agreement (k 0.771). Of 83 tiles classified as GG1 by urologists, the algorithm upgraded 53 (64%) to GG2, but median pattern 4 area was 3.9% (IQR 0.0009, 28.703) in those cases.

Conclusions: In this external validation, we found that the DeepDx algorithm had high agreement with expert urologists in cancer identification and grading, despite being trained with a different patient population and using biopsy cores instead of prostatectomy specimens. The speed and accuracy of deep learning-based systems has broad applications from allowing clinicians to better counsel patients to facilitating research requiring detailed annotation of datasets not feasible by human pathologists.

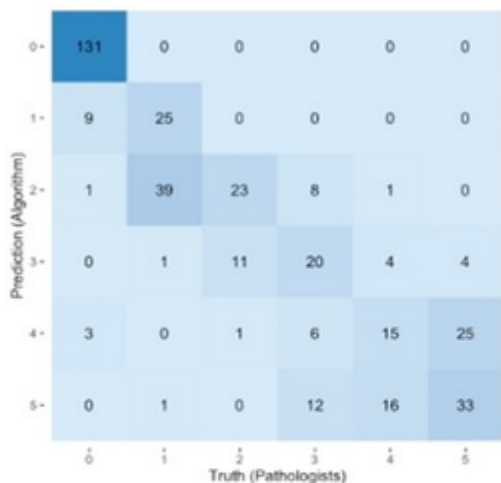


Figure 1a. Confusion matrix between Deep Dx Prostate and pathologist grading. 0 = Benign, 1-5 = according Gleason grade groups

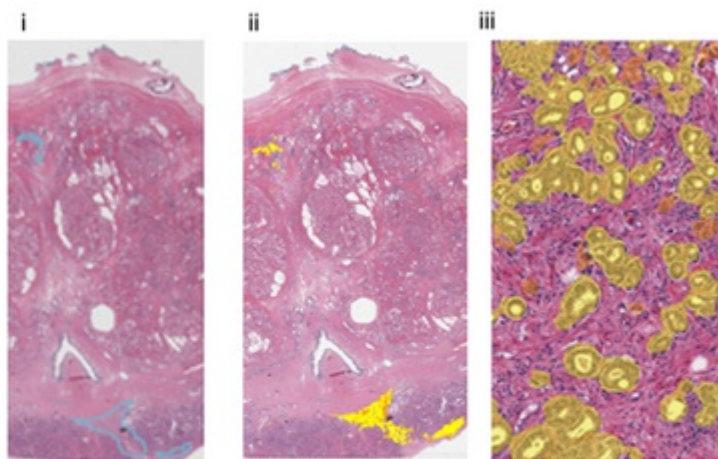


Figure 1b GG2 upgrade scenario:
i. Pathologist annotation GG 3+3. ii. Algorithm annotation GG 3+4. iii. Algorithm pixel level annotation of GG 4 location (orange) and GG 3 location (yellow)

156 The Natural History of Treated and Untreated Progression on Active Surveillance

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Abstract

Introduction: For men with clinically localized prostate cancer (CaP) managed with active surveillance (AS), oncologic outcomes after biopsy progression are not well understood. We aim to determine the impact of continuing AS after biopsy progression on oncologic outcomes.

Methods: Participants in our prospective AS cohort (1990-2018) were diagnosed with grade group (GG) 1 (localized CaP, PSA<20), upgraded to \geq GG2, and underwent further surveillance (biopsy/imaging/PSA). Patients were stratified by post-progression treatment within 5 years: continue AS and untreated (Group 0), pursue early RP \leq 6 months (Group 1), or undergo delayed RP >6 months (Group 2). Patients receiving other treatments were excluded. We compared sociodemographic variables and characteristics between groups and examined the associations of groups 1 and 2 with risk of adverse pathology (AP) on RP and biochemical recurrence (BCR) after RP.

Results: Of 520 patients with biopsy progression and further surveillance, 203 (39.0%) were untreated (group 0), 125 (24.0%) pursued early RP (group 1), and 192 (36.9%) had delayed RP (group 2). Median time to RP after upgrade in Group 2 was 17 months [IQR 8,28]. All 3 groups had similar age, race, and CAPRA scores, although Group 1 had higher risk genomic classifier scores (13% vs. 4%[Group 0], 8%[Group 2], $p<0.01$). Among the patients who underwent RP, Groups 1 and 2 had no difference in GG ($p=0.15$) or AP (55% vs. 53%, $p=0.74$) rate. Additionally, these groups showed similar 3-year BCR-free survival (80% vs. 87%, log-rank $p=0.64$). In multivariable models, only CAPRA-S at RP was significantly associated with risk of BCR (HR=1.42, 95% CI 1.24-1.63, Table 1).

Conclusion: Among patients continuing AS after biopsy progression, 61% eventually decided to undergo surgery within 5 years. Delayed surgery after progression was not associated with a higher risk of AP or BCR. This suggests select patients may be able to safely delay treatment after progression. Further work is needed to better understand which patients can safely delay treatment after biopsy progression.

Table 1. Cox proportional hazards regression with the outcome of recurrence-free survival after radical prostatectomy for men who had biopsy progression while on active surveillance

Parameter	P-value	Hazard ratio	95% CI lower limit	95% CI upper limit
UNIVARIATE MODEL				
Upgrade group 2 (vs group 1)	0.64	0.896	0.570	1.411
MULTIVARIATE MODEL				
Upgrade group 2 (vs group 1)	0.88	1.038	0.643	1.675
Age at diagnosis (years)	0.60	0.991	0.956	1.026
PSA at upgrade (ng/ml)	0.97	0.999	0.943	1.058
Year of surgery	0.40	1.027	0.966	1.093
Surgical CAPRA-S	<.01	1.418	1.236	1.628
PSA, prostate specific antigen; CAPRA-S, Surgical Cancer of the Prostate Risk Score; CI, confidence interval				

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191 Performance of High-Resolution Micro-Ultrasound for Diagnosing Clinically Significant Prostate Cancer in Men Undergoing a Screening MRI

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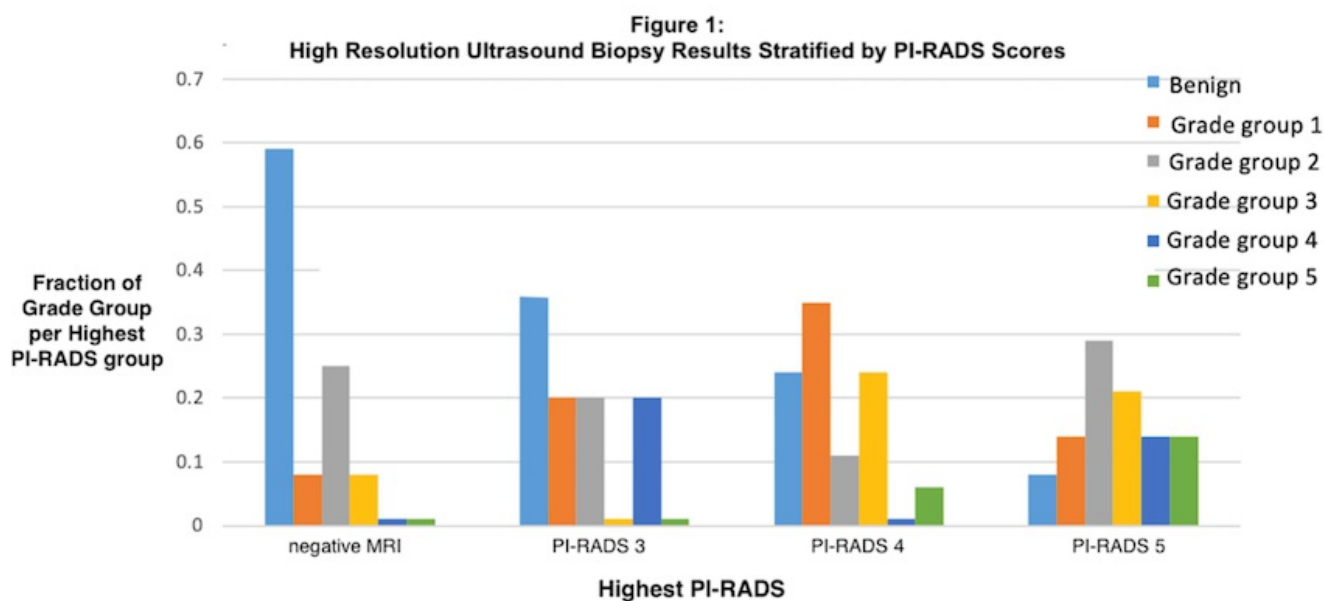
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Abstract

Objective: Prostate cancer is one of the most common cancers, affecting up to 11% of men. The diagnosis can be challenging, as most with prostate cancer are asymptomatic and diagnosed based on PSA screening. The standard prostate biopsy (bx) technique is with transrectal ultrasonography (US) (6-9 MHz) and either a transrectal or transperineal needle. Technological advances have produced a high frequency (29MHz) transrectal prostate micro-ultrasound system with up to 70mm resolution, allowing for finer visibility of ductal anatomy and cellular density. We examined our initial experiences with high frequency micro-ultrasound machine for the detection of prostate cancer after mpMRI.

Methods: We retrospectively examined records of 51 patients at our institution who underwent a prostate mpMRI followed by transrectal bx using the high-frequency US system (Exact Imaging, Toronto, Canada). On and off target cores were taken with MRI lesions targeted using the integrated fusion assist targeting system. The primary outcome was prostate cancer detection rate stratified by cancer grade group (GG) and PIRADS score. A secondary outcome was detection of GG ≥ 2 prostate cancer stratified by PIRADS score.

Results: Seventy-one percent of patients had a positive bx for carcinoma, with 51% of patients having GG ≥ 2 disease. Positive bx rates by PIRADS score were 60%, 76%, and 93% for PIRADS score 3,4, and 5, respectively. 81% of patients with GG ≥ 2 had a PIRADS ≥ 3 lesion on MRI. Forty-two percent of patients with a negative mpMRI (PIRADS ≤ 2) had a positive bx, with 80% of them having GG ≥ 2 disease. The negative bx rate decreased with increasing PIRADS score, from 58% with a PIRADS ≤ 2 , to 7% with a PIRADS 5 lesion. Figure 1 shows ultrasound bx results stratified by PI-RADS scores.



Conclusions: Our study demonstrated good performance of high-resolution ultrasound with cognitive assist for prostate cancer detection. The negative bx rate dropped substantially with higher PIRADS score and findings are consistent with other series describing technology for MRI lesion targeting.

193 The Effect of Preoperative Membranous Urethral Length on Likelihood of Postoperative Urinary Incontinence after Robot-assisted Radical Prostatectomy

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Abstract

Objective:

To assess the association of preoperative membranous urethral length (MUL) and the likelihood of persistent postoperative urinary incontinence on extended follow-up after robot-assisted radical prostatectomy (RARP) for prostate cancer.

Methods:

A retrospective analysis was performed on men who underwent RARP for prostate cancer at the University of California, San Francisco between 2000-2018. Patients were excluded if they failed to have continence follow-up within 6 months of RARP or preoperative MRI-measured MUL was not performed by a radiologist. A single, blinded urologist remeasured MUL retrospectively. Postoperative urinary continence was evaluated with two definitions: "strict continence" and "social continence." Strict continence was defined as self-reported absence of urinary leakage or pad usage. Social continence was defined as wearing up to one pad per day. Logistic regression models examined associations between radiologist- and urologist-measured MUL and likelihood of urinary incontinence post-RARP by the two continence definitions.

Results:

In 251 men with median follow-up of 42 months (IQR 29-76), the median MUL measurements were 14mm (radiologist) and 15mm (urologist) with poor agreement (interclass correlation coefficient 0.34). Strict continence was achieved by 79 (31%), 105 (61%), and 111 (69%) men within 6, 12, and 24 months of RARP, respectively. Social continence was attained by 172 (69%), 148 (86%), and 144 (89%) men within 6, 12, and 24 months of RALP, respectively. On logistic regression, urologist-measured longer MUL was associated with lower likelihood of strict incontinence within 6 months (odds ratio [OR] 0.87; 95% confidence interval [CI] 0.81-0.94) and 12 months (OR 0.90; 95% CI 0.82-0.98) and social incontinence within 6 months (OR 0.93; 95% CI 0.86-1.00) and 12 months (OR 0.84; 95% CI 0.74-0.95). Radiologist-measured longer MUL was associated with lower likelihood of strict incontinence within 6 months (OR 0.93; 95% CI 0.87-1.00) and social within 12 months (OR 0.87; 95% CI 0.77-1.00). MUL was not associated with likelihood of strict or social incontinence at 24 months.

Conclusion:

Preoperative MRI-measured MUL was not associated with urinary continence after 12 months post-RARP. Poor agreement between radiologists' and urologist's measurements supports standardizing MUL measurements to establish the likelihood of early incontinence after RARP.

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Goldberg-Benioff Program in Translational Cancer Biology

202 Impact of BMI on Quality of Life in Men with Surgically Treated Prostate Cancer

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Abstract

Objectives: Obesity can unfavorably affect surgical procedures and outcomes. However, the relationship between obesity and prostate cancer treatment remains unclear. The Expanded Prostate Cancer Index Composite for Clinical Practice (EPIC-CP) is a tool used to determine health related quality of life (HRQOL). The purpose of our study is to investigate the effects of body mass index (BMI) on patient reported EPIC-CP scores before and following prostatectomy.

Methods: We identified 960 men diagnosed with non-metastatic prostate cancer treated with prostatectomy (2008-2015). QOL was prospectively assessed using the EPIC-CP. Baseline BMI groups were categorized as: healthy (BMI \leq 24.9), overweight (BMI 25-29.9), and obese (BMI \geq 30). We determined mean QOL scores for each domain and used t-tests to compare baseline differences between BMI groups at every follow-up period (6, 12, 18, and 24 mo.). We defined domain minimally important differences (MID) using 0.5 pooled standard deviations (SD) of the 6-,12-,18-,24-month post-prostatectomy changes from baseline. Domain score changes from baseline \geq .5 SD were considered clinically significant, and p-value \leq 0.05 as statistically significant.

Results: The median age of men was 63 (IQR: 56.5-69) with a median follow-up of 3.07 years (IQR: 1.53-4.99). At baseline, obese men reported significantly worse urinary incontinence, urinary irritation, bowel, and sexual symptom scores(p=0.01) compared to healthy men. At 6-month follow-up, obese men reported significantly worse EPIC-CP scores in only urinary irritation(p=0.04) and sexual symptom domains(p=0.01). At 2-years follow-up, obese men did not demonstrate significant differences in QOL scores from baseline compared to normal weight men. Throughout the 2-year period, 30.68% of obese men in urinary incontinence, 73.49% in urinary irritation, and 78.26% in bowel symptom scores all achieved clinically significant improvements.

Conclusions: At baseline, obese men have worse overall EPIC-CP scores to normal weight men. At 2-years follow-up, no statistically significant differences in QOL were noted between obese and normal weight men. In the setting of a rising obesity epidemic, these findings are important for patient counseling.

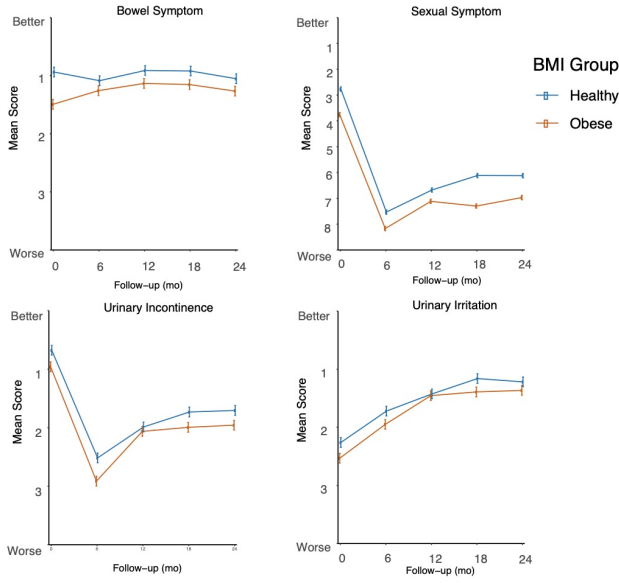


Table 1.	Healthy	Overweight	Obese
	N=200	N=471	N=289
Age at Surgery, Median (IQR)	64 (56.5-69)	63 (58-67)	62 (57-66)
CCI			
0	76 (38%)	187 (39.7%)	98 (33.9%)
1	46 (23%)	111 (23.6%)	88 (30.4%)
2	44 (22%)	108 (22.9%)	70 (24.2%)
3+	22 (11%)	50 (10.6%)	20 (6.9%)
Missing	12 (6%)	15 (3.2%)	13 (4.5%)
NCCN Risk			
Low	85 (42.5%)	192 (40.8%)	106 (36.7%)
Intermediate	78 (39%)	199 (42.3%)	127 (43.9%)
High	37 (18.5%)	80 (17%)	56 (19.4%)
Smoking Status			
Former	25 (12.5%)	69 (14.6%)	36 (12.5%)
Never	163 (81.5%)	387 (82.2%)	240 (83%)
Missing	12 (6%)	15 (3.2%)	13 (4.5%)
Diabetes			
Yes	4 (2%)	20 (4.2%)	30 (10.4%)
No	184 (92%)	436 (92.6%)	246 (85.1%)
Missing	12 (6%)	15 (3.2%)	13 (4.5%)
Median Baseline Bowel Score, IQR	0 (0-1)	0 (0-2)	0 (0-2)
Median Baseline Sexual Score, IQR	2 (0-4)	2 (0-5)	3 (1-6)
Median Baseline Urinary Score, IQR	0 (0-1)	0 (0-2)	0 (0-2)
Median Baseline Urinary Score, IQR	2 (0-4)	2 (0-4)	2 (1-4)

Table 2.	Healthy		Overweight		Obese	
	Achieved MID Improvement (%)	Patients with >= 1 MID Baseline Score	Achieved MID Improvement (%)	Patients with >= 1 MID Baseline Score	Achieved MID Improvement (%)	Patients with >= 1 MID Baseline Score
Urinary Incontinence	12 (25.5%)	47	39 (28.3%)	138	27 (30.7%)	88
Urinary Irritation	82 (80.4%)	102	200 (76.9%)	260	122 (73.5%)	166
Bowel Symptom	26 (63.4%)	41	99 (70.2%)	141	72 (78.3%)	92
Sexual Symptom	61 (30.5%)	200	153 (32.5%)	471	93 (32.2%)	289

109 The Effect of Race on Treatment Patterns and Health-Related Quality of Life (HRQoL) Outcomes in Men with Localized Prostate Cancer

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Abstract

Introduction: Effect of race on post-treatment HRQoL in localized prostate cancer (PCa) is not well known. We examined racial differences in treatment patterns and HRQoL in men undergoing active surveillance (AS), radical prostatectomy (RP), or radiation therapy (XRT).

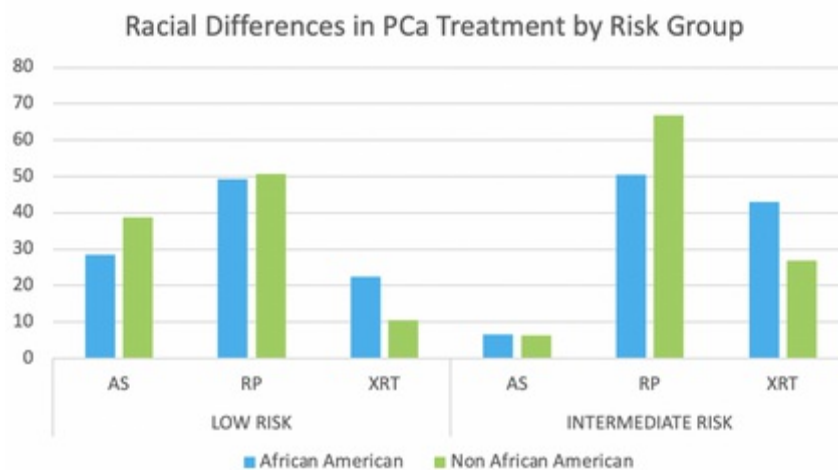
Methods: Men with low- or intermediate- risk PCa from 2007-2017 in the Center for Prostate Disease Research Database were identified. HRQoL at baseline and yearly for 5 years was evaluated using the Expanded PCa Index Composite (EPIC) and SF-36 Health Survey. Treatment patterns and HRQoL for AA and non-AA men were compared and assessed individually.

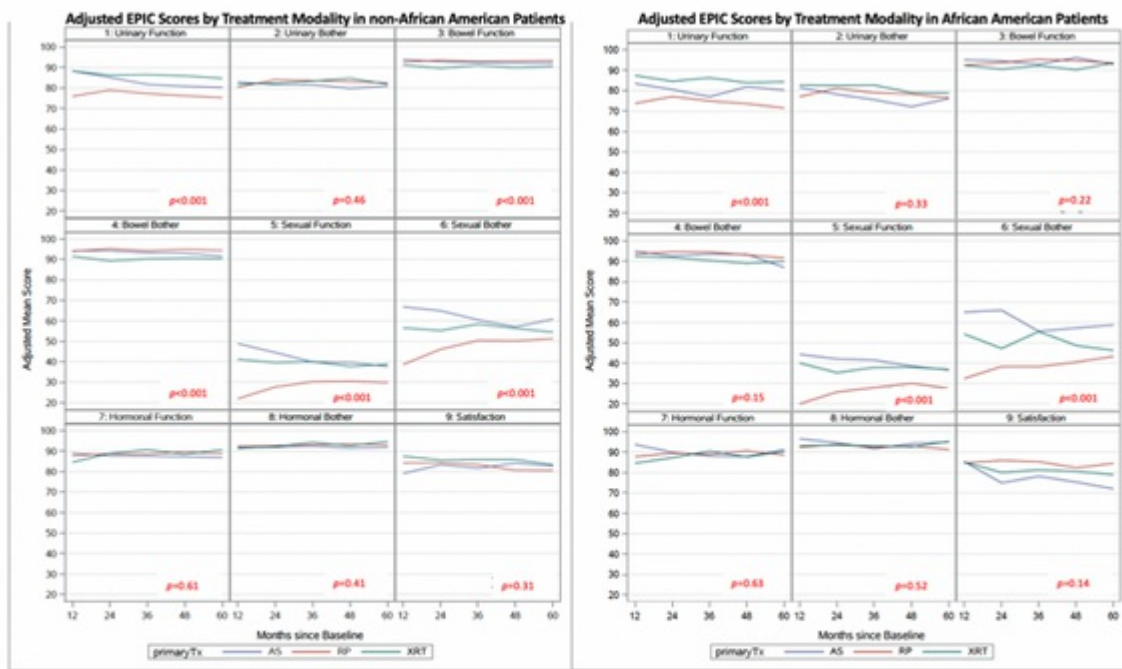
Results: In 1006 men with localized PCa, 223 (22.1%) were AA. Mean follow up was 5.3 years. AA men with low-risk disease had a lower rate of AS (28.5 vs. 38.8%) and higher rate of XRT (22.3 vs. 10.6%) than non-AA men, $p < 0.001$. Similarly, in intermediate-risk disease, AA received more XRT (43.0 vs. 26.9%) while RP rates were lower (50.5 vs 66.8%), $p = 0.016$.

HRQoL outcomes were compared between AA and non-AA men. No racial differences were found in urinary, bowel, sexual or hormonal scores for men undergoing AS, RP or XRT. SF-36 scores were also similar.

Within racial group comparisons were then performed. In AA and non-AA men, RP resulted in worse urinary and sexual function and bother compared to AS and XRT. Bowel HRQoL did not vary by treatment modality in AA men, however, in non-AA men, XRT resulted in worse bowel scores compared to AS and RP.

Conclusion: AA men have lower rates of AS in low-risk disease and higher rates of XRT in low- and intermediate-risk. HRQoL outcomes for individual treatment modalities are similar between races, however, effect of XRT on bowel symptoms compared to AS and RP may be worse in non-AA men.





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Urology Oncology Fellow

150 Patient Selection for Cognitive Fusion versus MRI-US Fusion Biopsy of the Prostate: A Multivariate Analysis from a Within Patient Protocol

Mitch Hayes MD, Alex Chau BA, Solange Bassale MS, Byung Park PhD, Sudhir Isharwal MD, Christopher Amling MD, Jen-Jane Liu MD
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Abstract

INTRODUCTION:

MRI-ultrasound fusion biopsy (Fus-Bx) and MRI cognitive fusion biopsy (Cog-Bx) of the prostate have been shown to have similar cancer detection rates. We sought to determine factors that affect agreement between Fus-Bx and Cog-Bx amongst patients who underwent both fusion modalities as part of a prospective same patient protocol.

METHODS:

From August 2017 to January 2021, patients with at least one suspicious lesion PIRADS 3 or greater on multiparametric MRI underwent both Cog-Bx and Fus-Bx in a prospective within patient protocol. Cog-Bx and Fus-Bx using the UroNav™ system were performed on the same regions of interest, followed by systematic 12 core biopsy. Patients on active surveillance were excluded. The primary endpoint was any cancer detection rate (CDR) (Gleason 3+3 or above). Concordance between modalities was analyzed across age, PSA, family history, digital rectal exam, lesion dimensions, lesion volume, prostate volume, PIRADs score, and anterior location. Chi-square and Fisher's exact tests were used for categorical variables and Wilcoxon rank sum test for continuous variables. A multivariate generalized mixed effect model was used to compare the interaction between select variables and fusion modality.

RESULTS:

91 patients and 98 lesions were included in the analysis. Mean age was 69 years. Median PSA was 7.31 ng/dl. Anterior location was the only variable associated with a significant variation in agreement, which was 30% of anterior lesions versus 10.3% of non-anterior lesions ($p = 0.035$). CDR of Cog-Bx and Fus-Bx in anterior lesions was 75% and 65%, respectively. Discordance did not significantly vary across other variables. In a mixed effect model, the interaction between anterior lesion location and use of software fusion was insignificant ($p = 0.531$), suggesting that cancer detection rate did not significantly differ between the two modalities amongst anterior lesions.

CONCLUSIONS:

Discordance in cancer detection between Cog-Fx and Fus-Bx was higher in anterior lesions when compared to non-anterior lesions. Other patient and lesion characteristics did not affect concordance. CDR of anterior lesions was not different between the two modalities. Additional studies are needed to determine if one fusion modality outperforms the other in larger prospective studies, especially amongst anterior lesions.

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93 Variance In Symptom Assessment Between Patient And Caregiver: A Prospective Study Of Patients With Metastatic Prostate Cancer

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Abstract

Objectives

Patient reported outcomes (PROs) are important in appropriately managing patients with cancer, and impact survival when closely monitored and managed. In patients with metastatic prostate cancer (mPCa), particularly, the reporting and recording of symptoms is important to accurately assess the clinical stage of disease in order to guide treatment in a timely manner. We compared patient and caregiver reported symptoms to determine the degree of concordance.

Methods

Men over the age of 18 diagnosed with metastatic prostate cancer on androgen deprivation therapy (ADT) and their caregivers were asked to voluntarily and independently complete a packet of three quality-of-life questionnaires: the Brief Pain Inventory (BPI) short-form, the FACT-P, and the EQ-5D. Caregivers were asked to respond to the questionnaires with their own perceptions of patient outcomes. The EQ-5D responses were compared using a chi-square test, and the FACT-P and BPI responses were each compared using a paired t-test.

Results

A total of 101 patient-caregiver dyads were enrolled in the study. Of the 101 caregivers, 78 (77%) were spouses or significant others, 16 (16%) were relatives, 2 (2%) were non-related friends or social workers, and 5 (5%) did not disclose their relationship. A significant difference ($p < .01$) was noted between caregivers' and patients' perceptions of the patients' emotional wellbeing, mobility, self-care ability, pain/discomfort, and anxiety/depression.

Conclusion

Overall, we observed both concordance and discordance between patients' and their caregivers' perceptions of patients' symptoms. Patients tended to minimize their physical and emotional symptoms, such as pain, anxiety, and limitations with mobility. Clinicians should be aware of variance in sources of PROs, as this could have significant influence in diagnostic and therapeutic decision-making.

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