Poster Session 7: Oncology–Prostate (Part 2)
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MP 7.1

Evaluating the efficacy of a novel prostate cancer screening decision aid in increasing prostate cancer awareness and improving shared decision-making in a vulnerable population

Evan Kovac[1,2], *Imran Khawaja*[2], *Dongmin Kim*[2], *Mahima Gurushankar*[2], *Rishi Shah*[2], *Malcolm Mattes*[3], *Robert E. Weiss*[1,2]

[1]Department of Urology, Rutgers Cancer Institute of New Jersey, Newark, United States; [2]Department of Urology, Rutgers New Jersey Medical School, Newark, United States; [3]Department of Radiation Oncology, Rutgers Cancer Institute of New Jersey, Newark, United States

Introduction: Prostate cancer (PCa) awareness is generally limited, and screening rates are lower among racial and ethnic minority populations compared to the general population, contributing to delayed diagnosis and increased PCa-specific mortality. We investigated the utility of a novel decision aid (DA) to bolster patients' knowledge and improve their ability to participate in shared decision-making.

Methods: We created a novel DA (Figure 1) directed at minority and other vulnerable men, and randomly surveyed patients attending a primary care clinic, with nearly a dozen physicians, in Newark, NJ, over eight months. Participants were randomly recruited to DA and non-DA cohorts at a rate of 2:1 irrespective of previous PSA screening. All patients completed a standardized pre-survey. The intervention cohort was then offered the DA. All participants then completed the post-survey within a week of their appointment. The post-survey for the DA cohort contained additional questions specific to the DA. Patient demographics were compared using Chi-squared analysis. DA utility was characterized through multivariate logistic regression.

Results: One hundred patients (DA, n=69 and non-DA, n=31) were surveyed. There were no significant differences in age (p=0.618), race (p=0.380), education level (p=0.314), or health insurance status (0.934) between cohorts (Table 1). Multivariate regression adjusted for confounding variables and demonstrated that after receiving the DA, patients were nearly five times more likely to strongly agree with having "received as much information as [they] wanted when deciding whether or not to get a PSA test" (OR 4.797, 95% CI 1.505–15.288, p=0.008) and more than three times as likely to strongly agree with being "happy with the decision in obtaining/not obtaining a PSA test" (OR 3.585, 95% CI 1.213–10.595, p=0.021) (Tables 2, 3). DA participants were over six times more likely to accept surgical or radiation therapy at a doctor's recommendation following a hypothetical PCa diagnosis (OR 6.15, 95% CI 1.875–20.169, p=0.003).

Conclusions: In an urban, underserved, and vulnerable community, our novel DA demonstrated significant utility in assisting patients to make an informed decision regarding PCa screening. The novel DA has the potential to serve as a validated outpatient resource to increase knowledge of PCa screening options and to reduce PCa disparities.

MP 7.1. Figure 1. Prostate cancer decision aid: (A) page 1; (B) page 2; (C) page 3.

MP 7.1. Table 1. Chi-squared analysis comparing patient demographics for DA and non-DA individuals

	Non-DA	DA	p
Age			0.618
<40 years	30.0%	26.5%	
40–49 years	20.0%	23.5%	
50–59 years	13.3%	25.0%	
60–69 years	30.0%	19.1%	
70+ years	6.70%	5.90%	
Race			0.380
White	6.7%	7.4%	
Black	60.0%	67.6%	
Hispanic/Latino	26.7%	20.6%	
Asian	3.3%	0.0%	
Pacific Islander/Hawaiian	3.3%	0.0%	
Native American/American Indian	0.0%	1.5%	
Other	0.0%	2.9%	
Marital status			0.793
Single	53.3%	50.0%	
Married	33.3%	30.9%	
Divorced	3.3%	10.3%	
Widowed	6.7%	7.4%	
Other	3.3%	1.5%	

MP 7.1. Table 1 (cont'd). Chi-squared analysis comparing patient demographics for DA and non-DA individuals

	Non-DA	DA	p
English first language			0.616
No	30.00%	23.50%	
Yes	70.00%	76.50%	
Education			0.314
Less than high school	13.30%	8.80%	
High school	70.00%	55.90%	
Undergraduate	10.00%	22.10%	
Graduate level education	6.70%	13.20%	
Home ownership			0.749
Own	10.00%	14.70%	
Rent	90.00%	85.30%	
Health insurance			0.934
Uninsured	10.00%	10.30%	
Medicaid	33.30%	35.30%	
Medicare	23.30%	17.60%	
Private healthcare coverage	33.30%	35.30%	
Veterans Affair Healthcare + private healthcare plan	0.00%	1.50%	

MP 7.1. Table 2. Chi-squared analysis of post-survey responses comparing DA and non–DA individuals

	Non-DA	DA	p
The decision I made about getting a PSA test (or not) was the best decision for me, personally.			
Strongly disagree	6.70%	0.00%	0.051
Disagree	10.00%	4.40%	
Agree	53.30%	45.60%	
Strongly agree	30.00%	50.00%	
I received as much information as I wanted when deciding whether or not to get a PSA test.			
Strongly disagree	33.30%	1.50%	<0.001
Disagree	20.00%	7.40%	
Agree	30.00%	36.80%	
Strongly agree	16.70%	54.40%	

MP 7.1. Table 2 (cont'd). Chi-squared analysis of post-survey responses comparing DA and non–DA individuals

	Non-DA	DA	p
I am happy with the decision in obtaining/not obtaining a PSA test.			
Strongly disagree	6.70%	0.00%	<0.001
Disagree	3.30%	5.90%	
Agree	66.70%	29.40%	
Strongly agree	23.30%	64.70%	
Now that you have spoken with your doctor, please answer the following question: If you are diagnosed with prostate cancer, would you accept treatment like surgery or radiation if your doctor recommends it?			
Yes	56.70%	88.20%	0.010
No	3.30%	0.00%	
Unsure	40.00%	11.80%	
Would you be comfortable living with untreated prostate cancer if your doctor feels that treatment is unnecessary and that it can be safely monitored with "active surveillance"?			
Yes	20.00%	36.80%	0.960
No	53.30%	51.50%	
Unsure	26.70%	11.80%	
Did you decide to proceed with getting a PSA test?			**<0.001**
Yes	16.70%	58.20%	
No	83.30%	41.80%	

MP 7.1. Table 3. Binary logistic regression analysis of DA patients' likelihood to respond "strongly agree" to survey question

	Odds ratio	95% confidence interval	p
The decision I made about getting a PSA test (or not) was the best decision for me, personally.	1.475	0.515–4.227	0.469
I received as much information as I wanted when deciding whether or not to get a PSA test.	4.797	1.505–15.288	**0.008**
I am happy with the decision in obtaining/not obtaining a PSA test.	3.585	1.213–10.595	**0.021**
Now that you have spoken with your doctor, please answer the following question: If you are diagnosed with prostate cancer, would you accept treatment like surgery or radiation if your doctor recommends it?	6.15	1.875–20.169	**0.003**

MP 7.2

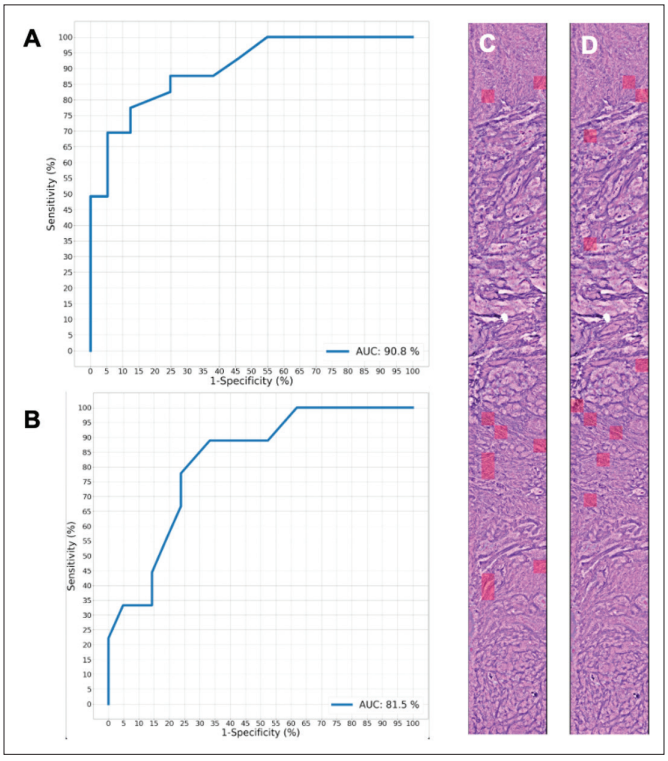
Artificial intelligence analysis of prostate biopsy stimulated Raman histology evaluates peritumoral tissue to predict prostate cancer extraprostatic extension and positive surgical margins

Miles P. Mannas[1,3], Adrian Ion-Margineanu[2], Fang-Ming Deng[4], Christian Freudiger[2], Lea Lough[9], James Wysock[5], William Huang[5], Steve Pastore[2], Derek Jones[4], Deepthi Hoskoppal[4], Jonathan Melamed[4], Daniel A. Orringer[6], Samir S. Taneja[5,7,8]

[1]Department of Urologic Sciences, University of British Columbia, Vancouver, Canada; [2]Invenio Imaging Inc, Santa Clara, United States; [3]Vancouver Prostate Centre, Vancouver, Canada; [4]Department of Pathology, NYU Langone Health, New York, United States; [5]Urology, NYU Langone Health, Vancouver, United States; [6]Neurosurgery, NYU Langone Health, New York, United States; [7]Radiology, NYU Langone Health, New York, United States; [8]Biomedical Engineering, NYU, New York, United States; [9]Gene Centrix, New York, United States

Introduction: Prostate cancer (PCa) extraprostatic extension (EPE) is common, frequently leading to positive surgical margins (PSM) during radical prostatectomy. Stimulated Raman histology (SRH) is a novel technique allowing near real-time, label-free, high-resolution images of unprocessed, unsectioned tissue providing both morphologic and biochemical information. We hypothesized that artificial intelligence (AI) assessment of prostate biopsy SRH may predict EPE and PSM.

Methods: Prospectively, prostate biopsies were obtained cognitively targeting MRI-visible PCa from ex-vivo radical prostatectomy specimens. The biopsies from 97 radical prostatectomy specimens were scanned in an SRH imager using two Raman shifts: 2845 cm-1 and 2930 cm-1, to create SRH images. Attention-based, multiple-instance learning, deep-learning neural networks (DLNN) were created: PCa identification, prediction of EPE, and PSM. The DLNN predicted EPE based on the highest risk patches and/or clinical characteristics: clinical stage, grade group, age, PSA, PSA density, PI-RADS score, MRI region of interest largest dimension, and region of interest area. DLNN were tested on prostate biopsies from 33 consecutive radical prostatectomies MRI identified PCa (Table 1). Intersection over union was used to test overlap of PCa and EPE/PSM prediction. None of the training nor testing biopsies exhibited EPE/PSM.



MP 7.2. Figure 1. SRH and DLNN analysis for PSM and EPE prediction in PCa. (A) ROC curve showing an AUC of 0.908 for EPE DLNN prediction using SRH and clinical characteristics. (B) ROC curve showing an AUC of 0.815 for PSM DLNN prediction using SRH and clinical characteristics. (C) SRH of grade group 2 PCa with DLNN top 10 predictive patches for EPE highlighted in red within the SRH image, showing apparently benign tumor-associated glands/stroma for prediction. (D) SRH of grade group 2 PCa with DLNN top 10 predictive patches for PSM highlighted in red within the SRH image, showing apparently benign tumor-associated glands/stroma for prediction.

MP 7.2. Table 1. Clinical and histopathologic features from participants used for the creation and testing of attention-based multiple-instance learning, deep-learning neural networks

Training Cohort (n=97)		Testing Cohort (n=33)	
	Median (IQR)		Median (IQR)
Age	64 (58-68)	Age	67 (63-74)
PSA	6.32 (4.64-9.58)	PSA	5.4 (4.1-7.6)
PSA Density	0.20 (0.12-0.24)	PSA Density	0.14 (0.12-0.15)
Prostate Volume (cc)	45.9 (40.0-57.0)	Prostate Volume (cc)	46.8 (37.2-64.9)
PI-RADS	n (%)	PI-RADS	n (%)
1	1 (1)	1	0 (0)
2	6 (6.2)	2	1 (3.1)
3	16 (16.5)	3	7 (21.2)
4	43 (44.3)	4	15 (45.5)
5	31 (32)	5	10 (30.3)
Prostate Biopsy ISUP Grade Group		Prostate Biopsy ISUP Grade Group	
1	8 (8.2)	1	3 (9.1)
2	45 (46.4)	2	5 (15.2)
3	15 (15.5)	3	15 (45.5)
4	13 (13.4)	4	7 (21.2)
5	16 (17.5)	5	3 (9.1)
Clinical Stage		Clinical Stage	
cT1	46 (47.4)	cT1	10 (30.3)
cT2	42 (43.2)	cT2	20 (20.6)
cT3	9 (9.3)	cT3	4 (4.1)
Radical Prostatectomy Pathology		Radical Prostatectomy Pathology	
Extraprostatic Extension		Extraprostatic Extension	
Yes	54 (55.6)	Yes	20 (60.6)
Positive Surgical Margin		Positive Surgical Margin	
Yes	29 (29.9)	Yes	9 (27.3)

Results: The DLNN AUC for PCa identification was 0.987. The DLNN AUC for EPE prediction with SRH and clinical variables was 0.908 (AUC of 0.79) with SRH alone. The DLNN AUC for PSM prediction with SRH and clinical variables was 0.815 (AUC of 0.75) with SRH alone. The DLNNs for EPE and PSM focused on apparently benign stroma while avoiding PCa (Figure 1), intersection over union PCa identification, and EPE/PSM prediction interquartile range 0–0.003.

Conclusions: AI used SRH for EPE and PSM prediction. AI-assisted outcome prediction may facilitate the investigation of usually overlooked variables, such as benign tumor-associated stroma and/or glands.

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MP 7.3

IsoPSA density and improved accuracy in prediction of clinically significant prostate cancer

Betty Wang[1], Kristina Dortche[1], Tarik Benidir[2], Zaeem Lone[1], Jennifer Bullen[3], Jane Nguyen[1], Andrei Purysko[1], Zeyad Schwen[1], Christopher Weight[1], Alp Tuna Beksac[1]

[1]Glickman Urologic Institute, Cleveland Clinic, Cleveland, United States; [2]Department of Urology, University of Florida, Gainesville, United States; [3]Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, United States

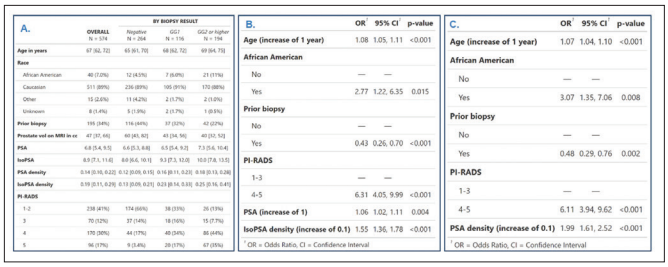
Introduction: Prostate cancer is the most common malignancy and second leading cause of cancer-related death in U.S. men aged 50 years and older. Many predictors have been established to anticipate clinically significant prostate cancer (csPCa). Accurate prediction is crucial to limit unnecessary invasive procedures. We investigated the ability of IsoPSA density to enhance the predictive accuracy of csPCa compared to traditional predictors alone.

Methods: A retrospective review of patients who underwent prostate MRI, prostate biopsy, and IsoPSA testing was conducted at a single institution. Known predictors of csPCa — PSA level, age, race, history of prior prostate biopsy, and PI-RADS score on prostate MRI — were collected. CsPCA was defined as Gleason score ≥7 on biopsy. Risk factors for csPCa were validated in our cohort using multivariable logistic regression. We formed three predictive models

using: 1) known predictors only; 2) known predictors plus IsoPSA density; and 3) known predictors plus PSA density. The predictive accuracy of these models was evaluated using area under the curve (AUC) analysis. AUCs were compared between models 1 and 2, as well as 1 and 3.

Results: Data from 574 patients was collected. Of those, 194 (34%) were found to have csPCa on biopsy (Figure 1). In a multivariable model, Black race, lack of prior biopsy, age, PSA, PI-RADS score, and IsoPSA density were associated with a higher risk of csPCa (Figure 1). Model 1 had an AUC of 0.806, model 2 had an AUC of 0.847, and model 3 had an AUC of 0.845. Models 2 and 3 significantly improved the predictive accuracy for csPCa compared to model 1 ($p<0.0001$) (Figure 2).

Conclusions: IsoPSA density enhances the predictive accuracy for csPCa beyond traditional predictors alone, achieving comparable results to PSA density. Further research is needed to validate these findings in external cohorts and to determine a clinically useful diagnostic threshold for IsoPSA density.



A.

	OVERALL N = 574	BY BIOPSY RESULT: Negative N = 264	GG1 N = 116	GG2 or higher N = 194
Age in years	67 [62, 72]	65 [61, 70]	68 [62, 72]	69 [64, 75]
Race				
African American	40 (7.0%)	12 (4.5%)	7 (6.0%)	21 (11%)
Caucasian	511 (89%)	236 (89%)	105 (91%)	170 (88%)
Other	13 (2.4%)	11 (4.2%)	2 (1.7%)	2 (1.0%)
Unknown	8 (1.4%)	5 (1.9%)	2 (1.7%)	1 (0.5%)
Prior biopsy	195 (34%)	116 (44%)	37 (32%)	42 (22%)
Prostate vol on MRI in cc	47 [37, 66]	60 [43, 82]	43 [34, 56]	40 [32, 52]
PSA	6.8 [5.4, 9.5]	6.6 [5.3, 8.8]	6.5 [5.4, 9.2]	7.3 [5.6, 10.4]
IsoPSA	8.9 [7.1, 11.6]	8.0 [6.6, 10.1]	9.3 [7.3, 12.0]	10.0 [7.8, 13.5]
PSA density	0.14 [0.10, 0.22]	0.12 [0.09, 0.15]	0.16 [0.11, 0.23]	0.18 [0.13, 0.28]
IsoPSA density	0.19 [0.11, 0.29]	0.13 [0.09, 0.21]	0.23 [0.14, 0.33]	0.25 [0.16, 0.41]
PI-RADS				
1-2	238 (41%)	174 (66%)	38 (33%)	26 (13%)
3	70 (12%)	37 (14%)	18 (16%)	15 (7.7%)
4	170 (30%)	44 (17%)	49 (34%)	86 (44%)
5	96 (17%)	9 (3.4%)	29 (17%)	67 (35%)

B.

	OR	95% CI	p-value
Age (increase of 1 year)	1.08	1.05, 1.11	<0.001
African American			
No	—	—	
Yes	2.77	1.22, 6.35	0.015
Prior biopsy			
No	—	—	
Yes	0.43	0.26, 0.70	<0.001
PI-RADS			
1-3	—	—	
4-5	6.31	4.05, 9.99	<0.001
PSA (increase of 1)	1.06	1.02, 1.11	0.004
IsoPSA density (increase of 0.1)	1.55	1.36, 1.78	<0.001

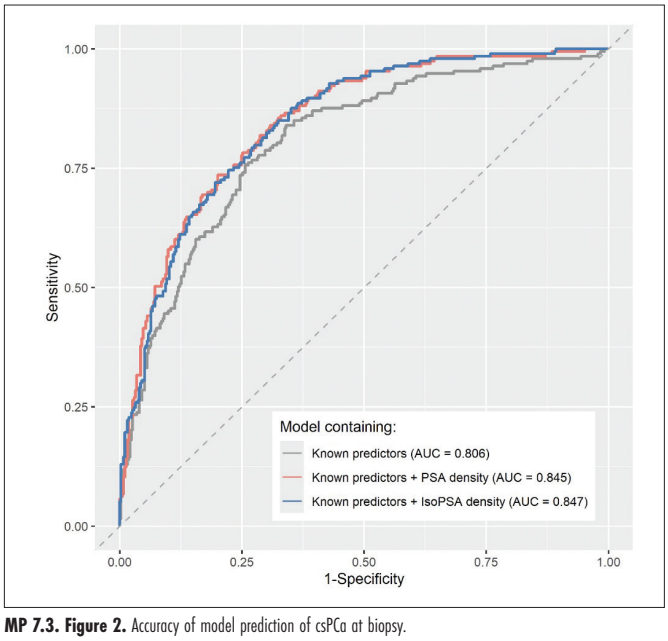
OR = Odds Ratio, CI = Confidence Interval

C.

	OR	95% CI	p-value
Age (increase of 1 year)	1.07	1.04, 1.10	<0.001
African American			
No	—	—	
Yes	3.07	1.35, 7.06	0.008
Prior biopsy			
No	—	—	
Yes	0.48	0.29, 0.76	0.002
PI-RADS			
1-3	—	—	
4-5	6.11	3.94, 9.62	<0.001
PSA density (increase of 0.1)	1.99	1.61, 2.52	<0.001

OR = Odds Ratio, CI = Confidence Interval

MP 7.3. Figure 1. (A) Demographics. Risk factors associated with csPCa: Multivariable logistic regression, including (B) IsoPSA density; and (C) PSA density.



MP 7.3. Figure 2. Accuracy of model prediction of csPCa at biopsy.

MP 7.4

Patient-reported outcomes of the MAST (Metformin Active Surveillance Trial) study: Analysis of a randomized, double-blind, placebo-controlled trial

David-Dan Nguyen[1,2,3], Jessica G. Cockburn[3], Rui M. Bernardino[1,3], Clare O'Connell[1,3], Nicole Manneh[1,3], Shabbir M.H. Alibhai[4,5], Neil E. Fleshner[1,3]

[1]Division of Urology, University of Toronto, Toronto, Canada; [2]Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada; [3]Department of Surgical Oncology, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, Canada; [4]Department of Medicine, University Health Network, University of Toronto, Toronto, Canada; [5]Department of Supportive Care, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, Canada

Introduction: Active surveillance (AS) is the recommended approach for managing low-risk localized prostate cancer (PCa). The MAST (Metformin Active Surveillance Trial) study investigated whether metformin could reduce disease progression in men undergoing AS for low-risk PCa. Recognizing that AS may cause some distress for some patients, the MAST trial provided an ideal context for exploring lower urinary tract symptoms, decisional regret, and anxiety related to PCa. Here, we report these patient-reported outcomes (PRO) to provide contemporary insights into AS experiences.

Methods: The MAST study was a randomized, double-blind, placebo-controlled trial conducted across 14 centers in Canada. Eligible patients had biopsy-confirmed, low-risk, localized PCa diagnosed within the past six months with a clinical stage of T1c-T2a. AS was selected as the primary management strategy. Patients were randomized (1:1) to receive either metformin 850 mg BID or placebo for three years. Patients were asked to complete the International Prostate Symptom Score (IPSS), Memorial Anxiety Scale for Prostate Cancer (MAX-PC), and decision regret score. PROs were compared between treatment arms at baseline, 18 months, and 36 months using the Mann-Whitney U test.

Results: The MAST study randomized 407 patients, with 204 receiving metformin and 203 receiving placebo. Response rates exceeded 99% at baseline and 36 months and 90% at 18 months for all PROs. Patients reported moderate lower urinary tract symptoms and no clinical anxiety throughout AS (Table 1). While patients experienced mild regret at baseline, they had no decision regret at 18 months and 36 months. There were no statistically significant differences in PROs between treatment arms at any time point (all $p>0.05$).

Conclusions: PROs were favorable and not different in both the metformin and placebo groups. Metformin does not adversely impact lower urinary tract symptoms, decision regret, and anxiety of patients on AS for low-risk PCa. More importantly, these findings reinforce modern AS as a suitable management option for low-risk PCa, sparing urinary function and minimizing anxiety, with no reported decision regret over the followup period.

MP 7.4. Table 1. Patient-reported outcome values at baseline and followup

Patient-reported outcome	Follow-up time	Metformin	Placebo	Overall	p-value*
IPSS, median (IQR)	Baseline	8 (4, 13)	7 (4, 13)	8 (4, 13)	0.69
	18 months	8 (5, 14.5)	8 (5, 14.5)	8 (5, 14.5)	0.98
	36 months	9 (3, 16)	10 (6, 18)	10 (5, 17)	0.24
Max-PC Score, median (IQR)	Baseline	13 (8, 22)	14 (8, 20)	13 (8, 20)	0.52
	18 months	13 (7.5, 21)	13 (8, 20.4)	13 (8, 21)	0.59
	36 months	12.5 (9, 19)	11 (5, 17)	12 (7, 18.5)	0.10
Decision Regret Scale, median (IQR)	Baseline	10 (0, 25)	10 (0, 25)	10 (0,25)	0.82
	18 months	0 (0, 20)	0 (0, 25)	0 (0, 20)	0.72
	36 months	0 (0, 12.5)	0 (0, 15)	0 (0, 15)	0.81

*p-value comparing PROs between metformin and placebo patients.

MP 7.5

Improved self-reported urinary and sexual function do not mediate the relationship between the delivery timing of the Prostate Cancer-Patient Empowerment Program (PC-PEP) and mental health: Secondary RCT analysis

Budoor Salman[1], Gabriella Ilie[1,2,3], Ross Mason[1], Ricardo A. Rendon[1], Andrea Kokorovic[1], Cody Macdonald[1,2], Nikhilesh Patel[3], David Bowes[3], Greg Bailly[1], Derek Wilke[3], Robert Rutledge[3]

[1]Department of Urology, Dalhousie University, Halifax, Canada; [2]Department of Community Health and Epidemiology, Dalhousie University, Halifax, Canada; [3]Department of Radiation Oncology, Dalhousie University, Halifax, Canada

Introduction: Prostate cancer patients commonly experience significant psychological distress, often exacerbated by complications from treatment. The Prostate Cancer Patient Empowerment Program (PC-PEP), a six-month comprehensive lifestyle and self-management intervention, has demonstrated efficacy in reducing psychological distress and improving urinary and sexual health. This secondary analysis explored whether improvements in urinary incontinence, urinary obstruction, and sexual function symptoms mediate the observed reduction in psychological distress among patients who received the intervention early or late (pre- or post-active treatment).

Methods: In a randomized controlled trial, 128 patients diagnosed with localized prostate cancer were randomly assigned to receive either PC-PEP with standard care (n=66) or standard care alone (n=62) for six months; at six months, the standard care group received the intervention for six months. Here, we compare the impact of the delivery timing of the intervention, early vs. late, on the mental health outcome, assessed using the Kessler Psychological Distress Scale (K10). Mediator outcomes were symptoms of urinary and sexual function reported through the Expanded Prostate Cancer Index Composite (EPIC) at baseline, six and 12 months. Mediation analyses were conducted using Hayes' PROCESS macro (model 4). Covariates included baseline psychological distress, EPIC scores, age, relationship status, prescribed medications for depression or anxiety, time from randomization to treatment, treatment modality (surgery vs. radiation), and Charlson comorbidity index. Indirect effects were estimated using bootstrapping with 5000 resamples.

Results: Urinary incontinence and obstruction symptoms significantly improved in the early intervention group compared to the late group (β=-13.84, p<0.001; β=-6.65, p=0.002, respectively); however, neither urinary incontinence nor obstruction mediated the effect of group assignment on mental health outcomes at intervention end (indirect effects: 0.75, 95% CI -0.07, 1.93; 0.75, 95% CI -0.31, 2.19, respectively). Sexual function symptoms did not differ significantly between groups (β=1.20, p=0.75) for the full sample and was not a significant mediator of mental health outcomes (indirect effect = -0.005, 95% CI -0.23, 0.26], p>0.05). Direct effects of intervention timing on K10 scores were also non-significant (β=-1.98 to 1.59, p>0.10). The statistical significance of these findings remained unchanged when stratified analyses were performed by treatment modality (radical prostatectomy vs. radiation therapy).

Conclusions: Improvements in EPIC domains, including urinary and sexual function symptoms, did not mediate the relationship between receiving the PC-PEP intervention and improved mental health outcomes in prostate cancer patients. These findings highlight that while PC-PEP significantly improves urinary and sexual health domains, these improvements alone are not the mechanism through which the program enhances mental health. Clinicians should consider additional factors beyond urinary and sexual symptoms to optimize mental health in their prostate cancer patients. Future research should explore alternative mediators and over a longer time to improve our understanding of the mental health benefits from PC-PEP.

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MP 7.6

Association between sociodemographic marginalization and receipt of intensified treatment for metastatic castrate-sensitive prostate cancer

David-Dan Nguyen[1,2], Raj Satkunasivam[3], Khatereh Aminoltejar[1,4], Amanda Hird[1,5], Soumyajit Roy[6], Scott C. Morgan[7], Shawn Malone[8], Bobby Shayegan[8], Girish S. Kulkarni[1,3,4], Quoc-Dien Trinh[9], Laura C. Rosella[2,10], Rodney Breau[11], Aly-Khan A. Lalani[12], Christopher J.D. Wallis[1,4,10]

[1]Division of Urology, Department of Surgery, University of Toronto, Toronto, Canada; [2]Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada; [3]Department of Urology, Houston Methodist Hospital, Houston, United States; [4]Department of Surgical Oncology, Princess Margaret Cancer Centre, University of Toronto, Toronto, Canada; [5]Division of Urology, Department of Surgery, Sunnybrook Health Sciences, University of Toronto, Toronto, Canada; [6]Department of Radiation Oncology, Rush University Medical Center, Chicago, United States; [7]Department of Radiation Oncology, The Ottawa Hospital Cancer Center, University of Ottawa, Ottawa, Canada; [8]Division of Urology, Department of Surgery, St. Joseph's Healthcare Hamilton, McMaster University, Hamilton, Canada; [9]Department of Urology, University of Pittsburgh Medical Center, University of Pittsburgh, Pittsburgh, United States; [10]Department of Epidemiology, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada; [11]Division of Urology, Department of Surgery, The Ottawa Hospital Research Institute, University of Ottawa, Ottawa, Canada; [12]Department of Medical Oncology, Juravinski Cancer Centre, McMaster University, Hamilton, Canada; [13]Division of Urology, Department of Surgery, Mount Sinai Hospital, University of Toronto, Toronto, Canada

Introduction: Intensified treatment with the addition of docetaxel and/or androgen receptor signalling inhibitors agents (ARSIs) to androgen deprivation therapy (ADT) has been shown to improve survival in patients with metastatic castrate-sensitive prostate cancer (mCSPC). Despite these benefits, real-world use remains inadequate. To assess potential differential access to these life-prolonging treatments, we examined the association between sociodemographic marginalization and the receipt of intensified treatment beyond ADT in patients newly diagnosed with mCSPC within a universal healthcare system.

Methods: In our population-based cohort study, we included men aged 66 years or older diagnosed with de novo mCSPC in Ontario, Canada, between January 2014 and November 2021. Hierarchical regression models adjusting for patient demographics, comorbidities, tumor characteristics, and physician characteristics were used to estimate odds ratios (OR) and 95% confidence intervals (CI) for the association between patient marginalization, measured by the Ontario Marginalization Index (ON-MARG), and receipt of intensified treatment, defined as the addition of an ARSI, docetaxel, or both within six months. ON-MARG, a validated measure created using Canadian census data, provides area-level measures of marginalization across four domains: 1) households and dwellings, which assess housing density, family structure, and the percentage of individuals living alone or in non-owned dwellings; 2) material resources, which measure access to basic needs, unemployment rates, and educational attainment; 3) age

MP 7.6. Table 1. Association between ON-MARG domains and treatment intensification among patients with de novo mCSPC in adjusted models*

ON-MARG domain	Effect estimate (95% CI)
Households & dwellings	OR 0.92 (0.85–0.98), p=0.02
Material resources	OR 0.93, (0.86–0.99), p=0.03
Age & labor force	OR 0.99, (0.94–1.04), p=0.65
Racialized & newcomer populations	OR 0.89, (0.81–0.97), p=0.01

*Each ON-MARG domain was modelled in separate multivariable models adjusting for patient characteristics, including age at diagnosis, Charlson comorbidity category, and area; tumor characteristics, including Gleason score at diagnosis; as well as physician age, sex, years in practice, specialty, and group volume.

and labor force, which describe the proportion of seniors, the dependency ratio, and labor force participation; and 4) racialized and newcomer populations, which capture the percentage of recent immigrants and individuals identifying as visible minorities.
Results: Among 6051 patients, 1465 (24%) received intensified treatment. Higher levels of composite marginalization were associated with a lower likelihood of receiving intensified treatment (OR 0.91, 95% CI 0.83–0.99, p=0.03). When examining individual domains of marginalization (Table 1), the racialized and newcomer populations domain showed the strongest negative association with the receipt of intensified treatment (OR 0.89, 95% CI 0.81–0.97, p=0.01).
Conclusions: Sociodemographic marginalization, particularly among racialized and newcomer populations, is associated with lower rates of intensified treatment in patients with de novo mCSPC, even within a universal healthcare system, further contributing to known disparities in prostate cancer outcomes.

MP 7.7

Trajectory timelines and treatment efficacy of 177Lu-PSMA-617 radioligand therapy for 50 cases of metastatic castration-resistant prostate cancer treated at a single center in the Canadian universal healthcare system

Frédéric Pouliot[1,4], Michele Lodde[1,4], Marjorie Besançon[4], Vincent Castonguay[2,4], Antoine Morin Coulombe[2,4], Vincent Fradet[1,4], Yves Fradet[1,4], Louis Lacombe[1,4], Éric Lévesque[2,4], Nicolas Marcoux[2,4], Paul Toren[1,4], Geneviève April[3,4], Frédéric Arsenault[3,4], Alexis Beaulieu[3,4], Narcisse Singbo[4], Céline Veilleux[4], Mélanie Tremblay Boily[4], Vincent Tremblay[4], François-Alexandre Buteau[3,4], Jean-Mathieu Beauregard[3,4]
[1]Département de Chirurgie, CHU de Québec-Université Laval, Quebec, Canada; [2]Département de Médecine, CHU de Québec-Université Laval, Quebec, Canada; [3]Département de Radiologie, CHU de Québec-Université Laval, Quebec, Canada; [4]CHU de Québec-Université Laval, Quebec, Canada
Introduction: Prostate-specific membrane antigen (PSMA)-targeted radioligand therapies (RLT) have emerged as a new class of agents for patients with metastatic castration-resistant prostate cancer (mCRPC). 177Lu-PSMA-617 has been shown to increase time to progression and overall survival (OS) when compared to best SOC in the VISION trial. Because of the need for PET/CT imaging before RLT and management by nuclear medicine specialists, implementation of RLT in the real world may be complex. This study analyzed the trajectory timelines and efficacy of RLT in a real-world setting.
Methods: Data were collected on 50 patients who started RLT after ≥2 lines of systemic therapy since November 2022. Patients were selected after PSMA-PET/CT showed PSMA-tracer uptake ≥ liver on ≥1 lesion and no discrepancy with conventional imaging or FDG-PET/CT. RLT cycles consisting of 7.4 Gy were administered intravenously every six weeks for up to six cycles.
Results: Median (95% CI) age and pre-RLT PSA levels were 72.6 years (65.9, 76.8) and 49.2 ng/mL (15.6, 180.7). Before RLT, 74% of patients had received ≥3 lines of systemic therapies for PCa. Median (95% CI) times between oncologist referral for RLT and nuclear medicine consultation or first RLT dose were 12 days (7.0, 32.0) and 42 days (27.5, 54.0), respectively. PSA25, PSA50, and PSA90 were reached in 56.3%, 50.0%, and 16.7% of patients, after a median of one, one, and two cycles, respectively. The mean followup time and median OS are 7.5 (95% CI 5.1, 11.3) and 13.0 (95% CI 8.0, not reached) months. In a multivariable Cox analysis including age, ISUP grade, location of metastases, number of previous lines, and having received >3 RLT cycles, only the latter was associated with a significant decrease in risk of death (HR 0.006, 95% CI 0.0–0.13).
Conclusions: Real-world data show RLT for mCRPC patients is feasible in our healthcare system, with comparable efficacy to that observed in the VISION trial. The study is limited by the short followup and its retrospective nature.
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MP 7.8

Transitional vs. peripheral zone MRI targeted biopsy: Is it needed?

Dhruv Lalkiya[1], Amy Beevor-Potts[1], Vahid Mehrnoush[1], Nishigandha Burute[1], Amer Alaref[1], Radu Rozenberg[1], Caio Vinicius Suartz[1], Walid Shabana[1], Walid Shahrour[1]
[1]Department of Urology, Northern Ontario School of Medicine, Thunder Bay, Canada
Introduction: Magnetic resonance imaging (MRI)-targeted biopsies are transforming prostate biopsy practices, with the transperineal approach gaining preference due to its lower infection risk. Improved access to MRI for prostate evaluation in Canada has led to an increase in pre-biopsy MRI use. This study examined prostate cancer detection rates based on tumor location (peripheral zone, transitional zone, or both), comparing MRI Prostate Imaging-Reporting and Data System (PI-RADS) scores with pathologic Gleason grades.
Methods: This single-center, retrospective study included 135 patients who underwent MRI-fusion transperineal biopsies between November 2021 and December 2024. Data for analysis, including biopsy results, PI-RADS scores, and PSA levels, were collected from patient records.
Results: Among 135 patients, MRI identified lesions in 52 (38.5%) cases within the peripheral zone, 67 (49.6%) in the transitional zone, and 16 (11.9%) in both zones. Biopsy outcomes showed cancer detection rates of 63.5% in the peripheral zone, 32.9% in the transitional zone, and 50% in both zones (Tables 1, 2). Comparing MRI findings with positive biopsy results across zones, the peripheral zone had two patients with PI-RADS 3 scores, with biopsies revealing low- (50%) and intermediate-risk (50%) cancer. Among the other 24 patients with PI-RADS 4 lesions, most detected cancer was at intermediate-risk, and in four patients with PI-RADS 5 lesions, biopsy categorized cancer as intermediate- (50%) and high-risk (50%). In the transitional zone, three patients with P-IRADS 3 lesions showed low-risk Gleason scores (100%), 14 patients with PI-RADS 4 had primarily intermediate- (57%) and high-risk Gleason (29%) score, and five patients with PI-RADS 5 showed intermediate-risk cancer in 75% of cases. For lesions in both zones, six patients with PI-RADS 4 had intermediate- (66.7%) and high-risk (33.33%) cancer, while five patients with PI-RADS 5 showed low to intermediate-risk cancer. Overall, MRI fusion transperineal biopsy effectively identified lesions in 73% of PI-RADS 4 cases in the peripheral zone, 31% in the transitional zone, and 50% in both zones.
Conclusions: Transperineal MRI-guided prostate biopsy for lesions in the transitional zone showed a lower cancer detection rate compared to lesions in the peripheral zone. Targeting lesions in the transitional zone still yielded significant prostate cancer detection. Therefore, the study recommends biopsies of lesions in the peripheral and transitional zones.
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MP 7.8. Table 1. Demographic information and prostate cancer detection rate

Average age of participants (n=135)			71 years		
Average PSA of participants			7.9 ug/l		
Biopsy	MRI fusion transperineal				
	Prostate cancer cone	Peripheral zone	Transitional zone	Peripheral + transitional	TOTAL n (%)
Pre-MRI biopsy		52 (38.5%)	67 (49.6%)	16 (11.9%)	135 (100)
Positive reported biopsy		33 (63.5%)	22 (32.9%)	8 (50%)	55 (40.7%)

MP. 7.8. Table 2. Prostate cancer detection in different zones

	Peripheral zone					
MRI scale	Gleason grade					
P (n=33)	1	2	3	4	5	Total (%)*
PI-RADS 3 (n=2)	1 (50%)	1 (50%)	0	0 (0%)	0	2 (18.1%)
PI-RADS 4 (n=24)	7 (29%)	9 (38%)	3 (13%)	5 (20%)	0	24 (72.7%)
PI-RADS 5 (n=7)	0 (0%)	3 (25%)	2 (25%)	2 (50%)	0	7 (100%)
	Transitional zone					
MRI scale	Gleason grade					
T (n=22)	1	2	3	4	5	Total (%)*
PI-RADS 3 (n=3)	3 (100%)	0	0	0	0	3 (15%)
PI-RADS 4 (n=14)	2 (14%)	8 (57%)	4 (29%)	0	0	14 (30.43%)
PI-RADS 5 (n=5)	1 (25%)	4 (75%)	0	0	0	5 (50%)
	Peripheral + transitional zone					
MRI scale	Gleason grade					
P+T (N=8)	1	2	3	4	5	Total (%)*
PI-RADS 3 (n=0)	0	0	0	0	0	0 (0%)
PI-RADS 4 (n=6)	0	2 (33.3%)	2 (33.3%)	2 (33.3%)	0	6 (50%)
PI-RADS 5 (n=2)	1 (50%)	0	1 (50%)	0 (0%)	0	2 (50%)

*% represents the total reported positive biopsy finding when compared to the same PI-RADS scale of MRI finding.

MP 7.9

Mediating effects of strength and aerobic training adherence on weight loss among men with localized prostate cancer: Secondary analysis of the PC-PEP phase 3, randomized controlled trial

Rebecca J. Power[1], Cody MacDonald[1,2], Gabriela Ilie[1,2,3], Rob Rutledge[3], Ricardo A. Rendon[1], Ross Mason[1], Greg Bailly[1], David Bowes[3], Derek Wilke[3], Nikhilesh Patil[3], Andrea Kokorovic[1]

[1]Department of Urology, Dalhousie University, Halifax, Canada; [2]Department of Community Health and Epidemiology, Dalhousie University, Halifax, Canada; [3]Department of Radiation Oncology, Dalhousie University, Halifax, Canada

Introduction: Patients undergoing curative treatment for localized prostate cancer often experience complications that reduce their quality of life. The Prostate Cancer Patient Empowerment Program (PC-PEP) is a six-month, multifaceted intervention designed to enhance patient well-being through physical activity, dietary guidance, stress management, pelvic floor muscle training, and intimacy support. Previous studies have shown that PC-PEP aids in weight loss and physical fitness compared to standard care, yet the underlying mechanisms driving this outcome remain poorly understood. This study evaluated the mediation of aerobic and strength training adherence on the relationship between timing of the PC-PEP intervention (early vs. late) on participant weight loss.

Methods: In a randomized controlled trial, 128 patients diagnosed with localized prostate cancer were randomly assigned to either an early intervention group, initiating PC-PEP prior to curative-intent treatment (0–6 months, n=66), or a waitlist control group receiving standard of care for the first six months and the intervention from 6–12 months (n=62). Here, we compare the impact of the delivery timing of the intervention: early vs. late on weight (kg), which were collected at baseline, six months, and 12 months through patient-reported questionnaires. Weekly self-monitoring surveys tracked aerobic and strength training adherence during the intervention. Mediation analyses were performed using the PROCESS macro for SPSS, with covariates including pre-intervention weight, time from randomization to treatment, age, Charlson comorbidity index, treatment modality, relationship status, and prescribed medications for depression or anxiety.

Results: Baseline physical activity levels were comparable between groups (p=0.871). At six months, the PC-PEP group demonstrated significantly higher physical activity levels compared to the control group (p=0.046). Mediation analysis indicated a significant indirect effect of physical training adherence on weight loss at six months (effect size = -0.590, 95% BootCI [-1.344, -0.0690]). No significant differences in mean weekly aerobic training adherence (early: 230.5 minutes vs. late: 207.3 minutes, p=0.502) or strength training adherence (72.93 vs. 69.68 minutes, p=0.740) were observed between the early and late groups throughout the intervention. Additionally, there was no significant indirect effect of intervention timing on post-intervention weight loss through aerobic activity (effect = -0.055, 95% BootCI [-0.641, 0.493]) or strength activity (effect = 0.009, 95% BootCI [-0.495, 0.462]).

Conclusions: This study highlights the critical role of PC-PEP at effectively promoting weight loss by increasing strength and aerobic activity levels over six months compared to standard care. Importantly, the timing of intervention (early vs. late) did not significantly affect adherence to aerobic or strength activities, suggesting that PC-PEP is an effective program for improving physical fitness in patients both pre- and post-active treatment. These findings underscore the value of PC-PEP as a holistic health intervention, empowering prostate cancer patients to achieve physical activity goals and improve overall health outcomes.

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MP 7.10

Non-invasive surveillance for patients with localized prostate cancer treated with NanoKnife irreversible electroporation focal therapy

Robert K. Nam[1], Rohan Shahani[1], Robert Sowerby[1], Michael Kogon[1], Tyler Gray[1], Ryan Fitzpatrick[1], Alaina Garbens[1], Amanda Hird[1]

[1]Division of Urology, University of Toronto, Toronto, Canada

Introduction: NanoKnife IRE focal therapy is an FDA-approved treatment for patients with localized, intermediate-risk prostate cancer. Past studies required patients to undergo mandatory biopsy after focal therapy to identify local recurrence. We evaluated the role of non-invasive surveillance after undergoing NanoKnife IRE.

Methods: We examined a prospective cohort of patients with localized prostate cancer treated with NanoKnife IRE from January 2023 to November 2024. Patients were followed with serial PSA and a post-NanoKnife prostate MRI at six months after treatment. We examined the number of IRE probes, prostate size, tumor location, and biopsy grade using MRI and PSA recurrence results as endpoints.

Results: Among 146 patients who underwent primary, focal treatment, the majority had grade group (GG) 2 disease (n=86, 58.9%), followed by GG3 or 4 (n=44,3 0.1%). Sixteen patients (11.0%) had GG1 disease with a corresponding lesion on prostate MRI (PIRADS score 3–5). The median PSA level at diagnosis was 11.0 ng/mL (range 0.9–25.0). The median prostate volume was 38.5 cc (range 13–139). Most patients required five IRE probes (n=76, 52.1%), followed by four (n=64, 43.8%) and then six (n=6, 4.1%). Of all baseline factors, prostate volume was positively correlated with the number of IRE probes (p=0.0009). Tumor location or grade were not associated with the number of IRE probes. Of the 146 patients, 91 had sufficient followup to undergo a six-month MRI, and of the 91, 85 complied (93.4%). Of the 85 patients who had a six-month prostate MRI, eight (9.4%) had an infield (area of NanoKnife treatment effect) lesion. After a median follow-p time of 12.3 months, four patients developed a PSA recurrence, with an overall two-year Kaplan-Meier PSA recurrence-free survival of 88.8%. All four patients underwent prostate biopsy and were positive for cancer. Of the patients with no MRI lesion, no patients developed a PSA recurrence (p=0.0005).

Conclusions: Among patients with a high proportion of intermediate-risk prostate cancer, the compliance rate to prostate MRI surveillance was high and no recurrences were missed by MRI. The number of needle probes was positively associated with prostate volume only. Ongoing followup will be required to determine whether imaging and PSA surveillance will replace mandatory biopsy following focal therapy to identify for recurrence.

MP 7.11

Clinicopathologic predictors of overall survival in castration-resistant prostate cancer patients with liver metastasis: A single-center, retrospective study

Ja Yoon Heo[1], Audrey Shiner[2], Madhi F. Naimi[3], Urban Emmenegger[1,2,3,4]

[1]Division of Medical Oncology, Odette Cancer Centre, Sunnybrook Health Sciences Centre, Toronto, Canada; [2]Temerty Faculty of Medicine, University of Toronto, Toronto, Canada; [3]Sunnybrook Research Institute, Sunnybrook Health Sciences Centre, Toronto, Canada; [4]Institute of Medical Science, University of Toronto, Toronto, Canada

Introduction: The liver is one of the most lethal metastatic sites of prostate cancer (PCa). Despite its association with poor overall survival (OS), PCa liver metastasis (PCLM) remains understudied, and its incidence is increasing as advanced treatments improve survival. This study examined the association between clinicopathologic factors and OS in PCLM patients (pts).

Methods: A retrospective analysis of 202 PCa pts treated at Odette Cancer Centre, Sunnybrook Health Sciences Centre, Toronto, ON (Canada), between 2012 and 2023 identified 81 pts with acquired liver metastases. OS was calculated using Kaplan-Meier analysis, and univariate and multivariate Cox regression models were employed to evaluate prognostic factors.

Results: In univariate analysis, pts with ≥10 liver metastases, high PSA levels at the time of LM diagnosis, a shorter interval between CRPC diagnosis and the development of LM, and concomitant lymph node metastasis demonstrated significantly poorer OS (p<0.05). Multivariate analysis validated the independent associations between ≥10 liver metastases and concomitant lymph node metastasis with adverse outcome. Kaplan-Meier analysis (Table 1) demonstrates significantly poorer OS in pts with ≥10 LM (median OS 2.8 vs. 6.8 months, p=0.0060) or concomitant lymph node metastases (median OS 3.4 vs. 5.9 months, p=0.0185).

Conclusions: Pending validation, PCa pts diagnosed with LM involving ≥10 lesions and concomitant lymph node metastases appear to have a particularly poorer prognosis and may be prioritized for testing novel treatment strategies.

MP 7.11. Table 1. Clinicopathologic factors associated with overall survival in patients with prostate cancer liver metastasis

	Univariate		Multivariate	
	HR (95% CI)	p	HR (95% CI)	p
Initial Gleason score	1.4996 (0.9281–2.4230)	0.1036		
Time from initial diagnosis to LM	1.0000 (0.9999–1.0002)	0.5993		
Time from CRPC diagnosis to LM	1.0003 (1.0000–1.0005)	0.0279*	1.0002 (1.0000–1.0005)	0.0644
Number of LM ≥10 at LM diagnosis	1.8758 (1.1878–2.9630)	0.0070*	1.9685 (1.2311–3.1476)	0.0047**
PSA at LM diagnosis	1.0005 (1.0002–1.0008)	0.0044*	1.0003 (1.0000–1.0007)	0.0584
Concomitant metastasis				
Bones	1.2783 (0.6809–2.4004)	0.4448		
Lymph nodes	1.8893 (1.1080–3.2206)	0.0194*	1.7857 (1.0709–2.8885)	0.0257**
Visceral organs	0.9809 (0.5808–1.6568)	0.9426		

*Factors with p<0.1 in univariate analysis were included in the multivariate analysis. **Statistically significant (p<0.05).

MP 7.12

Male pattern baldness and prostate cancer risk: Results from the BIOmarkers of Prostate Cancer/Prevention and Environment (BIOCaPPE) prospective study

Clément Larose[1,2,3,7], Roxane Tourigny[1,3], Fred Saad[4], Michel Carmel[5], Armen Aprikian[6], Yves Fradet[1,2], BIOCaPPE Network[1,2,3,4,5,6], Vincent Fradet[1,2,3]

[1]Centre de Recherche et de Centre de Recherche sur le Cancer, CHU de Québec-Université Laval et Université Laval, Quebec, Canada; [2]Faculté de Médecine, Université Laval, Quebec, Canada; [3]Centre Nutrition Santé et Société (NUTRISS) et Institut sur la Nutrition et les Aliments Fonctionnels (INAF), Université Laval, Quebec, Canada; [4]Centre de Recherche, Centre Hospitalier Universitaire de Montréal, Montréal, Canada; [5]Centre de Recherche, Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, Canada; [6]Institut de Recherche, Centre Universitaire de Santé McGill, Montreal, Canada; [7]CRAN - Biology, Signals and Systems in Cancer and Neuroscience (BioSIS) Department, UMR 7039 CNRS - Université de Lorraine France, Nancy, France

Introduction: The association between male pattern baldness and prostate cancer (PCa) remains debated. In this study, we examined the associations between baldness and PCa risk as part of the BIOmarkers of Prostate Cancer/Prevention and Environment (BIOCaPPE) study, set up to identify PCa risk biomarkers.

Methods: Between 2013 and 2020, 2053 men at risk of PCa were enrolled in the observational, multicenter, prospective cohort BIOCaPPE. At enrolment, participants self-reported their baldness using the modified Norwood-Hamilton scale at ages 20, 30, and 40, and at study baseline. PCa incidence is collected annually. A multivariable logistic regression Cox model was used to assess associations between baldness characteristics (frontal, vertex, age of onset, and severity) and the risk of developing PCa.

Results: Over a study period of 11 years, 313 cases of PCa were identified (median followup 6.4 years, Q1–Q3: 4.88–7.95). The adjusted preliminary results showed no association between baldness and PCa risk (HR 1.019, 95% CI 0.790–1.313, p=0.886). Stratifying by PCa grade, our results showed a non-significant trend between frontal baldness at study baseline and aggressive PCa (group grade ≥3) (HR 1.713, 95% CI 0.847–3.461, p=0.134). In the subgroup of participants not taking any 5-alpha reductase inhibitor, the HR between severe vertex baldness and PCa tended to be higher, but not significantly (HR 1.469, 95% CI 0.870–1.816, p=0.225).

Conclusions: These preliminary results do not support a strong association between baldness and overall PCa risk but suggest that the presence of frontal baldness could be a potential risk biomarker of aggressive PCa.

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MP 7.13

Impact of preoperative magnetic resonance imaging on radical prostatectomy margin status: A retrospective cohort study

Ricardo A. Rendon[1], Rodney H. Breau[3], Jonathan Izawa[2], Fred Saad[6], Alan So[5], Bobby Shayegan[4], Ross J. Mason[1], Martha Ellen Foley[1]

[1]Department of Urology, Dalhousie University, Halifax, Canada; [2]Division of Urology, Western University, London, Canada; [3]Division of Urology, University of Ottawa, Ottawa, Canada; [4]Department of Urology, McMaster University, Hamilton, Canada; [5]Department of Urologic Sciences, University of British Columbia, Vancouver, Canada; [6]Department of Surgery, University de Montreal, Montreal, Canada

Introduction: Positive surgical margins (PSMs) after radical prostatectomy are associated with inferior oncologic outcomes. Although preoperative prostate magnetic resonance imaging (MRI) is increasingly used in the management of prostate cancer to guide diagnosis and treatment decisions, the role of MRI on influencing PSM rates remains unclear. This study examined the impact of preoperative MRI on PSM in men with high-risk prostate cancer.

Methods: This retrospective, multicenter cohort study used a National Canadian Prostate Cancer database of patients who underwent radical prostatectomies from January 2005 to December 2016. Patients with high-risk disease were identified. Descriptive statistics and logistic regression analyses were conducted to assess the association between preoperative MRI use and PSM.

Results: A total cohort of 636 patients were identified with complete data, 34% (n=214) of whom had a preoperative MRI. PSM was present in 30% (n=76) among those with a preoperative MRI and 70% (n=175) in the non-MRI group (p=0.08). Logistic regression analysis showed no significant association between preoperative MRI and presence of PSM (OR 0.77, 95% CI 0.55–1.09, p=0.14).

Conclusions: Our work demonstrated that use of preoperative MRI in high-risk prostate cancer patients did not impact PSM rates. Although no significant difference was observed, we posit that this may be explained by preoperative MRI improving patient selection thereby potentially avoiding cases where PSM may be more likely. As access to MRI technology continues to improve, further work is needed to delineate how the use of MRI technology aids in prostate cancer management.

MP 7.14

Predicting clinically significant prostate cancer using artificial intelligence: A systematic review and critical appraisal using APPRAISE-AI

Keiran J.C. Pace[1], Jethro C.C. Kwong[2,3], Sanchit Kaushal[1], Kevin Zhang[1], Ibrahim Durowoju[1], Ryan Booth[1], Jeremy Wu[2], Shamir Malik[1], Adree Khondker[2], David-Dan Nguyen[2], Justin Chan[2], Alistair Johnson[3,4], Andrew Feifer[2,5,6], Girish S. Kulkarni[2,3,7]

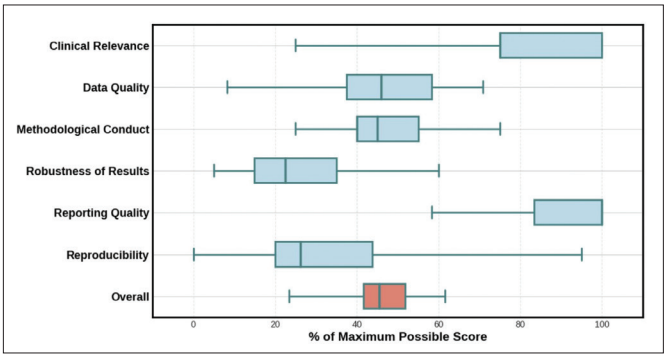
[1]Temerty Faculty of Medicine, University of Toronto, Toronto, Canada; [2]Division of Urology, Department of Surgery, University of Toronto, Toronto, Canada; [3]Temerty Centre for AI Research and Education in Medicine, University of Toronto, Toronto, Canada; [4]Division of Biostatistics, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada; [5]Division of Urology, Department of Surgery, University Health Network, Toronto, Canada; [6]Division of Urology, Department of Surgery, Trillium Health Partners, Mississauga, Canada; [7]Division of Urology, Department of Surgery, Princess Margaret Cancer Centre, University Health Network, Toronto, Canada

Introduction: The use of artificial intelligence (AI) to predict clinically significant prostate cancer (csPCa) has grown substantially. This systematic review aimed to assess the quality of these studies using the APPRAISE-AI tool, a framework evaluating six key domains: clinical relevance, data quality, methodologic conduct, robustness, reporting quality, and reproducibility. Additionally, this review compared the predictive performance of AI and non-AI approaches for csPCa.

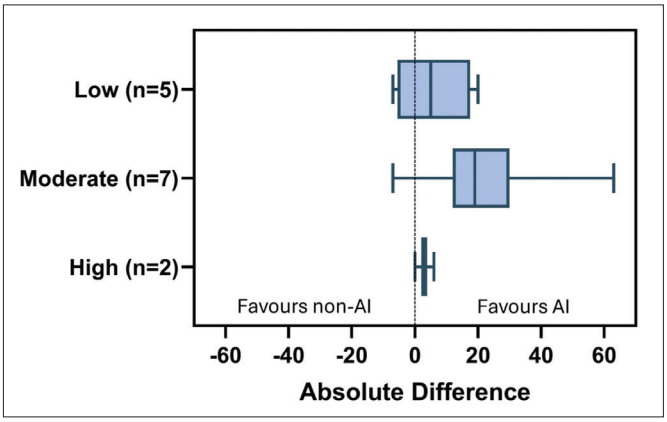
Methods: This systematic review followed PRISMA guidelines and was registered on PROSPERO. MEDLINE, EMBASE, Web of Science, and Scopus were searched from their earliest available records to February 2024. Studies were included if they developed or validated an AI model aimed at predicting csPCa in adult patients who were biopsy-naive or had negative prostate biopsies. Each study was assessed by two independent reviewers. Absolute performance differences between AI and non-AI models were recorded for specificity, sensitivity, and accuracy.

Results: A total of 99 studies met the inclusion criteria. Most studies were rated as moderate-quality based on the APPRAISE-AI tool. The median score was 45/100. Clinical relevance and reporting quality were the strongest domains among the included articles (median scores of 75/100 and 100/100, respectively), while robustness and reproducibility of the results were the weakest (median scores of 26/100 and 23/100, respectively) (Figure 1). Among studies that compared AI and non-AI approaches in the prediction of csPCa, AI approaches were generally favored, although the margin of benefit varied with study quality (Figure 2).

Conclusions: While AI models showed an advantage over non-AI methods for csPCa, this review highlighted persistent issues in the robustness and reproducibility of the results. Adhering to high-quality standards, as assessed by tools like APPRAISE-AI, is essential to support the integration of AI into clinical practice and to maximize its clinical utility in prostate cancer care.



MP 7.14. Figure 1. Box plot of APPRAISE-AI domain (blue) and overall (red) scores for the 99 studies using AI to predict csPCa. Each box represents the 25th and 75th percentiles, with the center line indicating the median and the whiskers extending to the min and max scores. Each field is presented as the percentage of the max possible score for that field to compare scores between fields.



MP 7.14. Figure 2. Box plot of absolute differences in reported performance metrics between AI and non-AI approaches, stratified by study quality according to overall APPRAISE-AI scores. Each box represents the 25th and 75th percentiles, with the center line indicating the median and the whiskers extending to the min and max scores.

MP 7.15

Clinical and radiologic correlates of primary prostatic tumor ductal component variation

Arya Bahadori[1], *Nishal Patel*[1], *Anthony Frankin*[1], *Matthew J Roberts*[1,2]
[1]Department of Urology, Royal Brisbane and Women's Health Hospital, Brisbane, Australia; [2]Faculty of Medicine , University of Queensland, Brisbane, Australia

Introduction: Ductal variant of prostate cancer (DAC) is highly aggressive, with worse prognosis when compared to the classical acinar prostate cancer (PAC). Pre-surgical characterization of DAC can be challenging, as PSA has been reported 30% lower than PAC-matched men and imaging characteristics have been poorly described, with minimal literature available, especially for PSMA PET/CT. The objective of this study was to evaluate the clinical and radiologic characteristics of men with variable components of DAC. This aims to improve preoperative characterization and treatment decision-making for these high-risk men.

Methods: We conducted a retrospective analysis of prospectively collected data from 2014–2021 with ethical approval through UnitingCare HREC. A specialist uropathologist identified cases with varying proportions of ductal adenocarcinoma (range 10–90%). Data obtained included participant demographics (PSA, clinical stage), mpMRI and PSMA PET/CT variables, and histologic findings at prostatectomy.

Results: A total of 137 men were included. Median age was 69 years (IQR 63–73) and PSA was 6.6 ug/L (IQR 4.6–9.3). Most had both mpMRI and PSMA PET/CT (105/137, 76.6%), while mpMRI (120/137, 87.6%) findings were mostly PI-RADS 4 (36%) or PI-RADS 5 (60%) involving the peripheral zone (89%). PSMA PET/CT (122/137, 89.1%) lesions had a median SUVmax of 6.6 (IQR 3.6–11.9), with suspicious lymph nodes in 4.1% (5/122) of scans. Regarding histology characteristics, the most prevalent Gleason score at prostatectomy was >4+5 (58.4%) followed by 4+3 (32.1%). The median proportion of DAC was 25% (IQR 20–30). Those with higher proportions (>30%) of DAC demonstrated Gleason pattern 5 in 82.6% (19/23) of prostatectomy specimens. All men with high-proportion DAC involved the peripheral zone, with 26% (6/23) involving the addition zones. Most (82.6%, 19/23) high-proportion DAC were locally advanced (>pT3a). Almost all (96.7%, 116/120) mpMRI-detected lesions were malignant and demonstrated increased accuracy when compared to PSMA PET/CT-detected lesions (91%, 111/122). In those with high DAC component (>30%), all had PI-RADS 4/5 lesions on mpMRI and 85% demonstrated PSMA PET/CT focally avid lesions. The median SUVmax of these men was 5.9 (IQR 3.5–9.4), lower than the overall cohort (median 6.6) and those who demonstrated SUVmax <3.5 all exhibited >50% DAC.

Conclusions: DAC is often combined with PAC in variable proportions but is generally associated with aggressive prostate cancer features. Imaging analysis suggests that mpMRI better detects DAC than PSMA PET/CT. Further investigation of imaging for ductal variant cancer is warranted.

MP 7.16

Cost savings in prostate cancer treatment: Oral gonadotropin-releasing hormone receptor antagonist is a cost-effective alternative to conventional androgen deprivation therapy

Rhea Coriaty[1], *Neal Rowe*[1]
[1]Division of Urology, The Ottawa Hospital, Ottawa, Canada

Introduction: Increasing drug prices pose a significant challenge for the healthcare system. Funding for prescription medications comes from government sources, private insurance, or out-of-pocket payments by individuals. As stewards of limited healthcare resources, physicians have a duty to consider medication costs. We aimed to compare the costs of common androgen deprivation therapy (ADT) regimens with a goal to identify the most cost-effective treatment options.

Methods: The costs of common prescription ADT medications were determined using the Ontario Drug Benefit/Comparative Drug Index Formulary. We tracked the cumulative costs of treatment formulations over time in addition to the cost of surgical castration at our institution.

Results: The costs associated with five years of ADT varied depending on the prescribed regimen and are estimated to be: degarelix $17 140, goserelin $24 300, leuprolide acetate $21 630$, triptorelin $20 990, and buserelin $ 27 750. For treatment beyond two years in duration, surgical castration was the most cost-effective. Relugolix, the sole FDA-approved oral gonadotropin-releasing hormone (GnRH) receptor antagonist, offers the lowest-cost pharmacologic treatment option, with an estimated cost over five years of approximately $16 400.

Conclusions: Cost variability exists among the various forms of ADT. While surgical castration continues to be the lowest-cost treatment, relugolix provides the most cost-effective pharmacologic alternative. This data provides clinicians with an opportunity to incorporate drug cost into treatment decisions where appropriate.