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MP-9.1

Association between baseline bone mineral density testing and the risk of fractures in men initiating androgen deprivation therapy: Population-based study

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Introduction: Androgen deprivation therapy (ADT) is a staple of advanced prostate cancer (PCa) treatment, however, several side effects are associated with its long-term use. Notably, loss of bone mineral density (BMD) is accelerated, which increases fracture risk. Although guidelines recommend BMD testing when initiating ADT to properly assess baseline fracture risk, there is scarce data to support this recommendation in the PCa patient population. The objective was to examine the association between baseline BMD testing (bBMDT) and the risk of fractures in men initiating ADT for PCa.

Methods: The cohort consists of men extracted from Quebec public health-care insurance administrative databases who were diagnosed with PCa from 2004–2015 and treated by ADT. Only patients who received at least one year of continuous ADT treatment were included. bBMDT was defined as a BMD test performed from 12 months prior to ADT initiation and up to three months after. The primary study outcomes were incidence of any fracture and incidence of fractures resulting in hospitalization. Adjustment for confounders was performed with inverse probability of treatment weights (IPTW) and included baseline characteristics, such as patient demographic variables, comorbidities, and risk factors for fractures.

Results: We identified 13 352 patients during the study period, of which 2070 (15.3%) underwent bBMDT. In adjusted analyses, bBMDT (hazard ratio [HR] 0.92, 95% confidence interval [CI] 0.76–1.12) was not associated with the risk of fracture. For fractures requiring hospitalization, bBMDT was associated with a lower risk (HR 0.72, 95% CI 0.52–0.98), with an IPTW-adjusted five-year incidence 6.8% for patients not receiving bBMDT and 4.7% for patients receiving bBMDT.

Conclusions: In our study population, bBMDT was associated with a lower risk of fractures resulting in hospitalization. Given the low uptake of bBMDT, additional efforts emphasizing the importance of BMD testing in guidelines may be needed.

MP-9.2

Overall and clinically significant prostate cancer detection rates using micro-ultrasound-guided biopsy

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Introduction: New technologies have been developed to improve the accuracy of prostate biopsies, including various advanced imaging techniques (multiparametric magnetic resonance imaging [MRI] and high-resolution micro-ultrasound [mUS]). We sought to identify overall and clinically significant prostate cancer (Gleason grade group ≥ 2 ; csPCa) detection rates using mUS-guided prostate biopsy.

Methods: From September to December 2021, 90 patients were prospectively entered into an observational cohort, and identified using the Alberta Prostate Cancer Research Initiative (APCaRI) database. All men underwent an MRI/mUS fusion prostate biopsy at the University of Alberta, completed by a single surgeon using the ExactVU device. Anonymous patient and disease-related data were collected and entered into a secure REDCap database. There is no intervention to the patient's usual care.

Results: Within our cohort, median age was 65, median prostate serum antigen (PSA) was 7.3 ng/mL, with a corresponding PSA density of 0.13. Patients had multiple indications for receiving a prostate biopsy, including 37 who were biopsy-naïve, nine who had prior negative biopsies, 28 on active surveillance (AS) needing a confirmatory biopsy, 15 on AS needing a surveillance biopsy, and one patient who was one year post-focal therapy. Using the Prostate Imaging Reporting and Data System (PI-RADS), 65 (72%) patients had a lesion on MRI that was PI-RADS ≥ 3 . Similarly, using the prostate risk identification using micro-ultrasound (PRI-MUS) risk identification protocol, 69 (77%) patients had a lesion on mUS that was PRI-MUS ≥ 3 . Overall cancer detection rate was 79%, with a csPCa detection rate of 34% (Table 1). csPCa detection rate was 49% in biopsy-naïve men; those with PRI-MUS >3 lesions had a csPCa detection rate of 56%, with an overall detection rate of 88%.

Conclusions: Our experience with mUS-guided prostate biopsies suggests an overall and clinically significant cancer detection rate similar to other imaging-guided biopsy techniques.

MP-9.2. Table 1. Cancer detection rate stratified by biopsy indication

	n	Any cancer detected	Detection rate (%)	Clinically significant cancer detected	Detection rate (%)
Overall	90	71/90	78.9%	31/90	34.4%
Indication					
Biopsy-naïve	37	30/37	81.1%	8/37	48.6%
Prior negative biopsy	9	5/9	55.6%	2/9	22.2%
AS confirmatory	28	24/28	85.7%	9/28	32.1%
AS surveillance	15	11/15	73.3%	1/15	6.7%
1-year post-HIFU	1	1	100.0%	1	100.0%

MP-9.3
Major adverse cardiovascular events risk after androgen deprivation therapy initiation is higher for older patients

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Introduction: Patients with prostate cancer (PCa) treated with androgen deprivation therapy (ADT) may experience major adverse cardiovascular events (MACE).^{1,2} However, there is some debate as to how much of MACE is caused by ADT itself. One risk factor that might influence MACE is increasing age. A study in the general population found that the rate of cardiovascular (CV) disease was approximately 15% higher for individuals 80 years and older compared to those 60–79 years old (90% and 91% for men and women vs. 78% and 75% for men and women, respectively).³ This study evaluated real-world data from patients with PCa on ADT to understand the impact of increasing age on MACE risk.

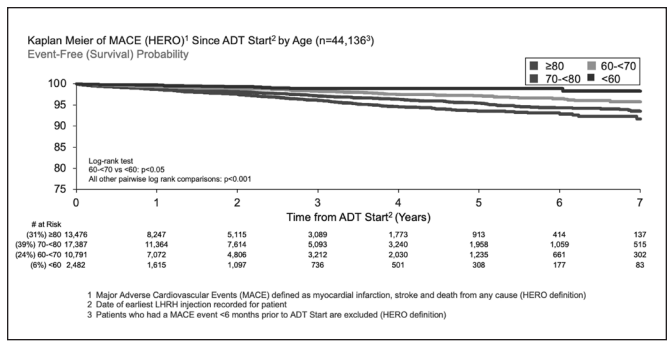
Methods: Analyses of US electronic medical records (2010–2020) of PCa patients (n=45 059) receiving luteinizing hormone-releasing hormone (LHRH) agonist and antagonist injections were conducted to evaluate MACE risk following ADT initiation in the following age subgroups: <60, 60 to <70, 70 to <80, and ≥80 years old. The database contained 178 388 LHRH agonist and antagonist injection entries and 965 documented MACE events. Exclusion criteria included MACE within six months prior to ADT initiation. MACE was defined as myocardial infarction, stroke, and death from any cause based on a recent study in this field.⁴ Kaplan-Meier event-free survival curves were constructed to compare the MACE risk between age subgroups. Statistical significance between survival curves was evaluated by log-rank test.

Results: Overall MACE risk was 2.4% and 6.0% at one year and seven years following ADT initiation, respectively; 6%, 24%, 39%, and 31% of patients were <60, 60 to <70, 70 to <80, and ≥80 years old, respectively. MACE risk following ADT initiation was higher for older patients compared to younger patients (Figure 1). All comparisons were p<0.001 except for 60 to <70 years vs. <60 years (p<0.05).

Conclusions: MACE risk was higher for older patients in the first seven years after ADT initiation. This could be due to the likely increased prevalence of comorbidities that contribute to CV disease in elderly patients, such as diabetes,⁵ obesity,⁶ and frailty.⁷ Clinicians should be aware that age is a predisposing risk factor for CV disease in patients with PCa undergoing ADT and consider risk-reduction strategies. Future studies evaluating the role of comorbidities on CV risk for PCa patients during ADT may be helpful to identify other CV predictors.

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MP-9.3. Figure 1. MACE-free survival following ADT initiation by age.

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MP-9.4
Active surveillance in men with intermediate-risk prostate cancer

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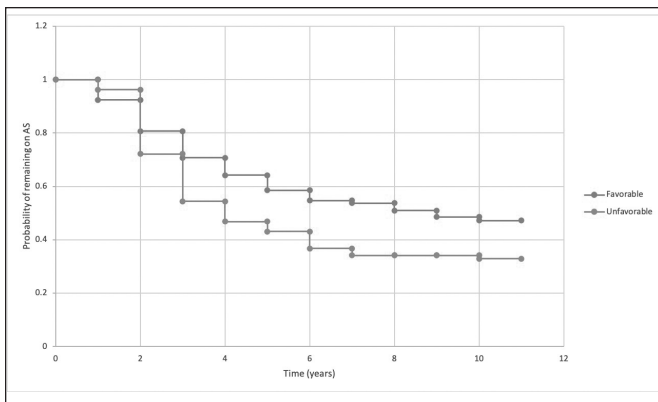
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Introduction: Active surveillance (AS) is well-established for the management of low- and very low-risk prostate cancer (PCa). Intermediate-risk PCa (IRPCa) represents a broad spectrum of disease biologically, and criteria to determine which patients are suitable for AS have not been established. Our objective was to identify predictors of disease progression in men with IRPCa.

Methods: Clinical data were collected from men diagnosed with PCa from 1993–2021 who were monitored on an AS protocol at the Vancouver Prostate Centre. A subject was considered on AS if a confirmatory biopsy was performed after an initial diagnosis of PCa. Men were classified into risk categories according to the National Comprehensive Cancer Network (NCCN) and Cancer of the Prostate Risk Assessment (CAPRA) scores. The primary endpoint was progression to definitive treatment (“intervention”), compared between risk groups.

Results: Analysis was performed on 1113 patients, including 291 (26.1%) with IRPCa, of whom 212 (72.9%) had favorable and 79 (27.1%) had unfavorable IRPCa. Median followup was 9.2 years (interquartile range 5.8). Intervention rates at five and 10 years were 36.7% (302/822) and 48.9% (402/822) for NCCN low-risk PCa and 45.7% (133/291) and 56.7% (165/291) for NCCN IRPCa, respectively. Intervention rates at five and 10 years were no different for CAPRA low and IRPCa. Favorable and unfavorable IRPCa intervention rates at five years were 41.4% (88/212) and 57.0% (45/79), respectively (hazard ratio [HR] 1.38, 95% confidence interval [CI] 0.96–1.98), and at 10 years were 52.8% (112/212) and 67.1% (53/79), respectively (HR1.27, 95% CI 0.95–1.70). Kaplan-Meier curves for men remaining on AS with favorable and unfavorable PCa are shown in Figure 1.

Conclusions: There was no observed difference in five- and 10-year intervention rates between men with low-risk vs. IRPCa, and unfavorable vs. favorable IRPCa. Multivariable analysis is ongoing to assess risk factors that predict need for definitive local therapy, which will help identify IRPCa patients most suitable for AS.



MP-9.4. Figure 1. Kaplan-Meier curves for men remaining on AS with favorable and unfavorable PCA.

MP-9.5
Development of a patient decision aid to facilitate shared decision-making for men with a BRCA2 mutation considering prophylactic prostatectomy

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Introduction: Men with a *BRCA2* mutation are at an increased risk of developing adverse consequences from prostate cancer, including metastatic disease and death. Unlike women with a *BRCA* mutation who are counselled on the option of prophylactic surgery to prevent advanced malignancies, men with *BRCA* mutations lack an evidence-based resource to guide shared decision-making regarding management options for their prostate cancer screening and prevention. The objective of this study was to develop a patient decision aid (PtDA) using an evidence-based process to facilitate shared decision-making for men with a *BRCA2* mutation considering prophylactic prostatectomy.

Methods: The International Patient Decision Aids Standards and the Ottawa Decision Support Framework were used to guide the development process. A steering committee of urologists, geneticists, genetics counsellors, patient advocates, research associates, and PtDA specialists was assembled. An online survey was used to obtain input from members of the steering committee regarding data to include on the PtDA. A literature review was performed to identify the outcomes of each management strategy. A PtDA was then created based on the best available literature available.

Results: A novel, evidence-based PtDA was created to facilitate shared decision-making for men with a *BRCA2* mutation considering prophylactic prostatectomy. The management options included were: 1) prophylactic prostatectomy or 2) monitoring with blood work and imaging tests. A summary of evidence tables was created to organize the data available for each outcome from the literature review. The current PtDA contains 14 pages and is at a SMOG ninth-grade reading level.

Conclusions: We have created a novel PtDA to facilitate shared decision-making for men with a *BRCA2* mutation considering a prophylactic prostatectomy. The next step in this project involves testing the tool for its acceptability among patients and other healthcare providers.

MP-9.6
Variability in testosterone measurement between radioimmunoassay, chemiluminescence assay, and liquid chromatography-tandem mass spectrometry (MS) among prostate cancer patients on androgen deprivation therapy

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Support: McCain Genitourinary Biobank

Introduction: Monitoring testosterone (T) levels is increasingly being recommended to guide the effectiveness of androgen deprivation therapy (ADT) in the treatment of advanced prostate cancer (PCa). T levels of less than 20 ng/dl (0.7 nmol/L) on therapy have been associated with better outcomes, with some clinicians advocating medication switch for patients who do not achieve this level. Three main assays for T measurement exist, including radioimmunoassay (RIA), chemiluminescence assay (CLIA), and liquid chromatography-tandem mass spectrometry (MS). CLIA and RIA are commonly used worldwide, however, MS is regarded as the reference standard. We set out to determine the discordance rates of T measurements among men on ADT.

Methods: A retrospective McCain GU biobank (MGB) database review of PCa men on luteinizing hormone-releasing hormone (LHRH) mono-

MP-9.6. Table 1. Clinical and pathological characteristics of study cohort

Characteristics	Value
Patients, n (%)	95(100)
Mean age, years (range)	70.0 (50–92)
Local clinical T stage, n (%)	
T1	17 (24.3)
T2	32 (45.7)
T3	18 (25.7)
T4	3 (4.3)
Missing	25
Metastasis status at sampling, n (%)	
M0	30 (33.3)
M1	60 (63.7)
Missing	5
Biopsy overall Gleason grade, n (%)	
6	1 (1.2)
7	32 (39.5)
8	15 (18.5)
9	29 (35.8)
10	4 (4.9)
Missing	14
Duration of ADT	
Mean, months (range)	24.1 (2–144)
ADT therapy, n (%)	
Agonist	80 (87.9)
Antagonist	10 (11.0)
Anti-androgen	1 (1.1)
Missing	4
Indication for ADT, n (%)	
Part of radiotherapy	7 (7.4)
PSA failure post-primary treatment	21 (22.1)
High-risk non-metastatic disease	11 (12.6)
Metastasis	46 (48.4)
Neoadjuvant therapy	10 (10.6)

MP-9.6. Table 2. Testosterone measurements subdivided by assay and sub-category

Assay (ng/dL)	n (%)
CLIA	
<20	90 (94.7)
20–50	2 (2.1)
>50	3 (3.2)
MS	
<20	89 (93.7)
20–50	4 (4.2)
>50	2 (2.1)
RIA	
<20	76 (80.0)
20–50	16 (16.8)
>50	3 (3.2)

MP-9.6. Table 3. 3x3 table comparing CLIA and MS

	MS <20	MS 20–50	MS >50	Total
CLIA <20	88 (98.9%)	2 (50.0%)	0 (0.0%)	90
CLIA 20–50	1 (1.1%)	1 (25.0%)	0 (0.0%)	2
CLIA >50	0 (0.0%)	1 (25.0%)	2 (100.0%)	3
Total	89	4	2	95

Percentages are column percents. Agreement was 95.7%, and the weighted Fleiss kappa was 0.838 (95% CI 0.656–1).

MP-9.6. Table 4. 3x3 table comparing MS and RIA

	MS <20	MS 20–50	MS >50	Total
RIA <20	74 (83.1%)	2 (50.0%)	0 (0.0%)	76
RIA 20–50	15 (16.9%)	1 (25.0%)	0 (0.0%)	16
RIA >50	0 (0.0%)	1 (25.0%)	2 (100.0%)	3
Total	89	4	2	95

Percentages are column percents. Agreement was 81.1% and the weighted Fleiss kappa was 0.504 (95% CI 0.207–0.801).

MP-9.6. Table 5. 3x3 table comparing CLIA and RIA

	Chemo <20	Chemo 20–50	Chemo >50	Total
RIA <20	76 (84.4%)	0 (0.0%)	0 (0.0%)	76
RIA 20–50	14 (15.6%)	1 (50.0%)	1 (33.3%)	16
RIA >50	0 (0.0%)	1 (50.0%)	2 (66.7%)	3
Total	90	2	3	95

Percentages are column percents. Agreement was 83.2% and the weighted Fleiss kappa was 0.582 (95% CI 0.336–0.828).

therapy for three or more months was conducted. Patients with exposure to second-line hormone agents or chemotherapy were excluded. Corresponding serum samples were identified and split in triplicate for measurement via all three assays. Observational data was reported and T measurements were analyzed for variability, looking for categorical concordance. Over and under-estimation rates were calculated.

Results: Ninety-five patients were included with a mean age of 70 (50–92) years. Eighty (88%) patients were on LHRH agonist therapy. Mean ADT

duration was 24.1 (3–144) months. Mean T levels were different, with MS at 11.4 (0.1–282) ng/dL, CLIA at 23.4 (20–204) ng/dL, and RIA at 15.1 (0.1–170.5) ng/dL ($p < 0.001$). Most (95%) patients had T ≤ 20 ng/dL by MS and CLIA as compared to only 80% by RIA. After subdividing into T categories of ≤ 20 , 20–50, and ≥ 50 ng/dL, concordance analysis showed that 4.3% and 18.9% of T measured by MS would have a different category result when remeasured by CLIA (Kappa 0.84) or RIA (Kappa 0.50); 16.8% of T measured by CLIA would also have a different category result when remeasured by RIA (Kappa 0.58) (Table 1). Intra-class correlation coefficient between all three measures was 0.83 (95% confidence interval [CI] 0.77–0.88). CLIA and RIA overestimated T in 66% of patients, with T < 20 ng/dL measured by MS. Conversely, CLIA and RIA underestimated T in only 2.4%, with T > 20 ng/dL measured by MS (Tables 2, 3, 4, 5).

Conclusions: There is significant variability in T measured with RIA, CLIA, and MS. CLIA and RIA overestimated T levels in the majority of patients, leaving a concern of misdiagnosing true castrate patients as being inadequately treated. Clinicians should be mindful of variability in T measurements by assays when using them for decision-making among PCa patients on ADT.

MP-9.7

Patient-centered pathology reporting improves patient experience and understanding of disease in prostate cancer care

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Introduction: Effective communication using written and verbal language improves patient understanding and satisfaction when receiving their cancer diagnosis and prognosis. We investigated the benefit of a patient-centered pathology report in patients undergoing radical prostatectomy (RP) for prostate cancer (PCa). Our study evaluated patient understanding of their PCa diagnosis post-RP, upon receiving either a standard pathology report or a personalized PC report.

Methods: Patient satisfaction questionnaires (Perceived Efficacy in Patient-Physician Interactions [PEPPI], Consultation And Relational Empathy [CARE], Communication Assessment Tool [CAT]) and a knowledge test were conducted at baseline, and then again at four weeks. Accurate recollection of Gleason grade group (GG) and extracapsular extension (ECE) were classified as 'correct.' Baseline demographic data were tested between groups using the Student t-test, Chi-squared test, or Fisher's exact test depending on whether data was continuous, categorical, or sparse. Comparison of correctly answered knowledge questions was analyzed using the Chi-squared test. A significance level of $p < 0.05$ was used.

Results: Data from 52 patients were analyzed (25 standard vs. 27 PC report). No significant baseline differences were found between groups. Both groups reported high levels of satisfaction with experiences in all domains of patient-physician rapport, empathy, and communication. There was no significant differences in PEPPI (zero weeks $p = 0.61$, four week $p = 0.75$), CAT ('excellent' rating scores at zero weeks $p = 0.30$ and four weeks $p = 0.48$), and CARE (zero weeks $p = 0.78$, four weeks $p = 0.55$) scores. The PC report group had significantly more correct answers on GG and ECE, as compared to the standard report group at zero and four weeks ($p = 0.01$ and 0.004 , respectively).

Conclusions: Preliminary data demonstrate a PC pathology report improves patient knowledge and understanding of their PCa that is retained for at least four weeks after initial receipt of results.

MP-9.8
Pathological Gleason grade group 1 in Black men — implications for renaming it “not cancer” in high-risk populations

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Introduction: Many have suggested reclassifying Gleason grade group 1 (GG1) as “not cancer;”¹⁻³ however, the metastatic potential of pathological (p) GG1 has not been widely studied in high-risk men. Thus, we sought to compare features of pGG1 prostate cancer (PCa) in Black and White men. **Methods:** The National Cancer Institute’s Surveillance, Epidemiology and End Results (SEER) database was queried to identify all White and Black men who underwent primary radical prostatectomy (RP) with pelvic lymph node dissections (PLND) from 2006–2016. Patients were pathologically staged according to the American Joint Committee on Cancer’s 7th edition (2010) and assigned a Gleason score in accordance with the 2005 International Society of Urological Pathology (ISUP) grading system. Rates of pT3a, pT3b, pT4, pN1, and clinical M+ disease were calculated. Other variables analyzed included prostate-specific antigen (PSA) at diagnosis, age, and year of RP. Non-parametric testing was used to compare differences between White and Black men. Patients with incomplete grading or staging information were excluded.

Results: We identified 27 367 men (21 223 White and 6143 Black) who underwent RP and PLND from 2006–2016 with pGG1 PCa. The median age range was 60–64 years and 55–59 years for White and Black men, respectively. The median PSA at diagnosis was 5.1 (interquartile range [IQR] 4–6.8) and 5.2 (IQR 4.2–7.2) for White and Black men, respectively. Rates of pT3a, pT3b, and T4 in White men were 4.4%, 0.5%, and 0.07%, respectively, compared to 4.5%, 1.3%, and 0.5% for Black men, respectively. Rates of T3b and T4 were statistically higher in Black men (p<0.01 for both). Rates of pN1 and M+ were exceedingly low in both groups and were not statistically different (Table 1).

Conclusions: Black men with pGG1 PCa have low but statistically higher rates of locally advanced disease when compared to White men. Metastatic rates are exceedingly low and similar between the groups. Renaming GG1 to “not cancer” in high-risk populations is, therefore,

controversial. This study is limited by the inability to conduct pathological and metastatic staging review, especially in cases where undergrading or overstaging are suspected.

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MP-9.9
The effect of prostate cancer center proximity on patient outcomes and treatment type selection

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Introduction: Access to a cancer center and a urology service may be critical for diagnosing and managing prostate cancer while it is still curable. The purpose of this study is to determine the relationship between proximity to the cancer center to presentation and treatment selection.

Methods: Between 2010 and 2017, a cohort of 959 patients diagnosed with prostate cancer was retrospectively reviewed. The baseline demographics, postal code, round trip time to the cancer center, clinical staging, prostate-specific antigen (PSA) at diagnosis, pathological data obtained during biopsy, staging investigations, selected treatment option, and followup data were reported. The cohort was divided into two groups: those living above and those living below 300 km from our center. The distance between the patient’s home and the hospital, as well as the clinical stage, Gleason score, PSA, pathological staging, and treatment modality selected, were statistically analyzed.

Results: The mean distance from patient residence to hospital was 115.7 km. There was a significant correlation between PSA at diagnosis and distance to the hospital (p<0.001, Correlation coefficient=0.16). The median PSA at diagnosis was 8.8 ng/dl vs. 13.6 ng/dl between patient group ≤300 km compared to patient group >300 km (Table 1). The percentage of Gleason 6 patients was significantly lower in the group that lived >300 km (13.6% vs. 21.4%, p=0.002) (Table 2). The initial diagnosis of metastatic prostate cancer was found to be significantly higher in the group that lived >300 km from the treatment center (22.3% vs.15.3%, p=0.02). The choice of radical prostatectomy as a treatment modality was found to be significantly higher in the group that lived >300 km away from the treatment center (69.9% vs. 54.4%, p=0.0005).

Conclusions: Distance from urologists and cancer centers plays a significant role in the presentation and treatment of prostate cancer. PSA was found to increase for every km the patient is away from the urologist. Distance was a factor in the choice of radical prostatectomy compared to radiation, likely secondary to the reduction in travelling.

MP-9.8. Table 1. Clinical and pathological features of Gleason grade group 1 prostate cancer in White and Black men who underwent primary radical prostatectomy between 2006–2016

	White (n=21 223)	Black (n=6143)	p
Age at diagnosis, years, n (%)			<0.01
<55	4460 (21)	2064 (34)	
55–59	4875 (23)	1574 (26)	
60–64	5100 (24)	1267 (21)	
65–69	4277 (20)	918 (15)	
≥70	2511 (12)	320 (5)	
Year of diagnosis, n (%)			<0.01
2006–2010	5306 (25)	3702 (60)	
2011–2016	15917 (75)	2441 (40)	
Median PSA at diagnosis, ng/dL (IQR)	5.1 (4–6.8)	5.2 (4.2–7.2)	<0.01
Pathological T-stage, n (%)			
T3a	932 (4.4)	279 (4.5)	0.6
T3b	110 (0.5)	82 (1.3)	<0.01
T4	14 (0.07)	31 (0.5)	<0.01
Pathological N1, n (%)	36 (0.2)	14 (0.2)	0.4
Clinical M+, n (%)	12 (0.05)	6 (0.09)	0.3

MP-9.9. Table 1. Correlation between distance and PSA

	PSA at diagnosis		Number of positive cores	
	Correlation coefficient (r)	p	Correlation coefficient (r)	p
Distance	0.163	<0.001*	0.075	0.059

Spearman’s rank correlation coefficient. *Statistically significant at p≤0.05.

MP-9.9. Table 2. Relation between PSA, Gleason, DRE, number of positive cores, and distance

Characteristics	Distance		p
	≤300 km	>300 km	
PSA at diagnosis ng/dl median(range)	8.8 (0.4–2704.0)	13.6 (2.3–5901.0)	<0.0001*
Gleason grade, n (%)			
G6	144 (21.4)	22 (13.6)	0.02*
>G6	528 (78.6)	140 (86.4)	
Clinical stage, n (%)			
T1c	295 (75.4)	43 (69.4)	0.3
>T1c	96 (24.6)	19 (30.6)	
Diagnosis, n (%)			
Localized	625 (84.7)	153 (77.7)	0.02*
Metastatic	113 (15.3)	44 (22.3)	
RP for localized PCa, n (%)			
No	340 (54.4)	107 (69.9)	0.0005*
Yes	285 (45.6)	46 (30.1)	

χ²: Chi-squared test. *Statistically significant at p≤0.05.

MP-9.10

Salvage partial gland ablation for recurrent prostate cancer following primary treatment with partial gland ablation: Functional and oncological outcomes

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Introduction: Although salvage radical prostatectomy (sRP) is a well-described salvage option in cases of primary partial gland ablation (pPGA) the evidence supporting salvage PGA (sPGA) is limited.^{1,2} We report the oncological and functional outcomes of patients treated with sPGA following initial treatment with pPGA.

Methods: We performed a retrospective review of patients at three medical centers between 2005 and 2017. Oncological outcomes were assessed using biochemical recurrence (BCR) and biopsy-proven recurrence (BPR). Functional outcomes were described using the International Prostate Symptom Score (IPSS), International Index of Erectile Function (IIEF), and rates of urinary incontinence (use of >1 pad/day).

Results: We identified 25 patients who underwent sPGA. High-intensity focused ultrasound (HIFU) was the main modality used. The median age and prostate-specific antigen (PSA) level at baseline were 65 years (interquartile range [IQR] 52–77) and 7.46 ng/mL (IQR 1–25), respectively. At BPR following pPGA, the majority of patients (42%) had PCa grade group 4 disease. The median length of followup from pPGA to last followup was 27.3 months (IQR 14.6–86.3). Following sPGA, 13/25 patients (52%) had BCR with a median time to recurrence of 14 months (IQR 2.5–82.15) and recurrence-free survival (RFS) of 24.5 months (95% confidence interval [CI] 15.3–NR). Of those 13 patients, four had sRP, four had salvage radiotherapy, three were managed with active surveillance, one had a third PGA, and one was managed with androgen deprivation therapy (ADT). The mean change from baseline to last followup in IPSS and IIEF scores was +1.3 (p=0.66) and -2.3 (p=0.32), respectively; 9% of patients had urinary incontinence at baseline, with only one additional patient developing incontinence following sPGA.

Conclusions: After undergoing two PGA procedures, results from our cohort demonstrate a favorable oncological outcome in 50% of patients after a median length of followup of 27.3 months, with non-significant effects on functional outcomes.

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MP-9.12

A survey of Canadian urologists' and radiologists' perspectives regarding the use of prostate magnetic resonance imaging in biopsy-naive patients

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Introduction: Evidence and guidelines now support the use of magnetic resonance imaging (MRI) in biopsy-naive men to improve detection of clinically significant prostate cancer (PCa), decrease overdiagnosis of insignificant PCa, and avoid biopsy in low-risk cases. However, the demand for MRI will be difficult to meet within the Canadian universal healthcare system.

Methods: Separate surveys were developed for urologists and radiologists in Canada to assess perspectives on the use of pre-biopsy MRI, barriers to implementation, and to explore options for streamlining high- and low-risk patients. After iterative development, bilingual surveys were distributed from June to September 2021.

Results: Respondents included 175 urologists and 84 radiologists (Table 1); 61% of urologists expected an increase of >50% in MRI volumes for their biopsy-naive patients. Currently, only 19% of respondents request MRI for over half of their patients vs. 59% who anticipate they will do so in the future. Most respondents (89%) felt that some high-risk patients could proceed directly to biopsy if they were sufficiently high-risk, but this varied by prostate-specific antigen (PSA) threshold, palpable extra-prostatic extension, and risk calculator score. For urologists and radiologists combined, the highest-rated barriers to MRI were inadequate infrastructure, reimbursement, and volume/expertise. Most also agreed that there would be increased system-level costs, although patients would have reduced discomfort and complications; 66% of urologists felt that pre-biopsy MRI would lead to a long delay (1–3 months) in PCa diagnosis compared to only 27% of radiologists.

Conclusions: The implementation of MRI for the diagnosis of PCa in biopsy-naive patients will substantially impact the Canadian healthcare system, with the majority of urologists expecting that they will order MRI for more than half their patients. However, most respondents agreed

MP-9.12. Table 1. Respondent characteristics of urologists and radiologists

	Urologists	Radiologists
Number of respondents	175	84
Response rate	175/953 (18.4%)	84/2499 (3.4%)
Geographical location		
Alberta & BC	25 (14.3%)	33 (39.3%)
Ontario	93 (53.1%)	28 (33.3%)
Quebec	44 (25.1%)	20 (23.8%)
Atlantic Canada	13 (7.4%)	3 (3.6%)
Years in practice		
1–10 years	68 (38.9%)	50 (59.5%)
>10 years	97 (55.4%)	34 (40.5%)
Type of practice		
Academic	99 (56.6%)	55 (65.5%)
Non-academic	73 (41.7%)	29 (34.5%)

that some high-risk patients could be streamlined directly to biopsy to conserve limited resources. Finally, barriers in MRI infrastructure, reimbursement, and expertise remain to be addressed.

MP-9.13
Statin use and survival in men receiving androgen-ablative therapies for advanced prostate cancer: A systematic review and meta-analysis of cohort studies

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Introduction: Evidence supports a role for statins in improving survival in advanced prostate cancer (PCa), particularly among men on androgen-ablative therapies. We systemically reviewed and meta-analyzed the relationship between statin use and survival among men with PCa on androgen deprivation therapy (ADT) or androgen receptor-axis-targeted therapies (ARATs).

Methods: Six databases were searched from inception to May 18, 2021, for studies reporting on post-diagnostic statin use and survival outcomes (hazard ratios [HRs]). Two authors independently abstracted all data. Study quality was assessed using the Newcastle-Ottawa Scale. The primary outcomes included overall mortality (OM) and prostate cancer-specific mortality (PCSM). Summary estimates pooled multivariable HRs with 95% confidence intervals (CIs) using the generic inverse variance method with random-effects modeling. Heterogeneity was assessed and quantified. A priori subgroup and sensitivity analyses were undertaken, and publication bias was evaluated. Confidence in the evidence was assessed using GRADE.

Results: Twenty-five cohorts of 119 878 men (64 717 statin users [54%]) with over 74 416 mortality events were included. Post-diagnostic statin use was associated with a 27% reduction in the risk of OM (19 cohorts, HR 0.73, 95% CI 0.66–0.82, I²=83%) and a 35% reduction in the risk of PCSM (14 cohorts, HR 0.65, 95% CI 0.58–0.73, I²=74%), with significant heterogeneity in both estimates. Subgroup analyses identified a PCSM advantage of statins for men on ARATs compared to ADT (HR 0.40, 95%CI 0.30–0.55 vs. HR 0.68, 95% CI 0.60–0.76, p-difference <0.01). Confidence in the overall evidence was “low” for both outcomes.

Conclusions: Post-diagnostic statin use reduced both overall and prostate cancer-specific mortality in men on androgen-ablative therapies for advanced PCa. Randomized controlled trials are warranted to validate these findings.

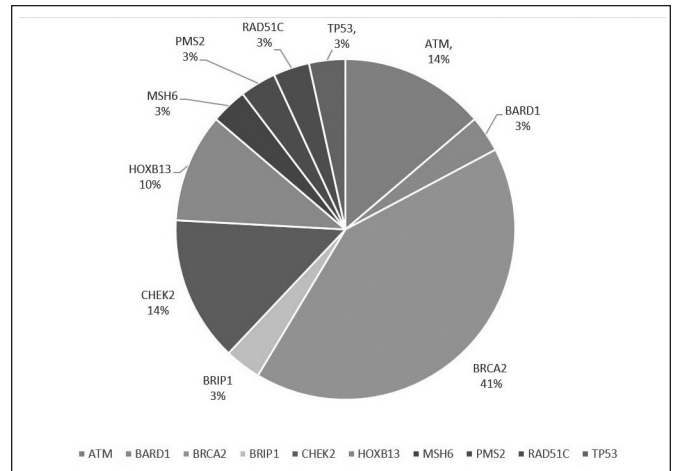
MP-9.14
Implementation of updated Ontario hereditary prostate cancer testing criteria at Princess Margaret Cancer Centre

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Introduction: Hereditary cancer genetic testing (HCT) has become a significant component of prostate cancer (PCa) management, and can identify other cancer risks, as well as at-risk relatives.¹⁻⁵ Despite new Cancer Care Ontario (CCO) guidelines recommending multigene HCT for certain patients with PCa,⁶ there are limited data on how these patients can optimally access HCT and genetic counselling.⁷ At the Princess Margaret Cancer Centre (PM), we implemented PCa HCT based on CCO guidelines using two models: HCT initiated by a urologist/oncologist/genetic counsellor in oncology clinic, or by a genetic counsellor in the PM genetics clinic.

Methods: A retrospective review was conducted to assess the implementation of CCO PCa HCT guidelines at the PM. PCa patients who underwent HCT in 2020 and 2021 were reported. A two-tailed t-test was used to compare testing timelines for the two models of care, and



MP-9.14. Figure 1. Positive hereditary cancer test results.

a Chi-squared test was used to compare hereditary cancer gene carriers identified through each model of care.

Results: In 2020, of 77 patients were referred; 29 and 48 underwent HCT in oncology and genetics clinics, respectively. In 2021, of 230 patients were referred; 135 and 95 underwent HCT in oncology and genetics clinics, respectively. HCT identified carriers of 10 different hereditary cancer genes (Figure 1). Of patients tested in the genetics clinic, 10.3% were identified as carriers, while 13.5% of patients tested in oncology clinics were identified as carriers (p=0.46). When HCT was initiated in the oncology clinic, results were disclosed to patients an average of 71 days from referral, compared to 129 days for those with HCT through the genetics clinic (p<0.001).

Conclusions: HCT volumes have increased since guidelines became available for Ontario PCa patients. A multidisciplinary approach to HCT was associated with faster time to results. Further study is needed to evaluate the impact of HCT on PCa management and patient perspectives on HCT delivery.

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MP-9.15**The evolution of the education module for men with metastatic prostate cancer (mPCa) in the Prostate Cancer Supportive Care program before and after the COVID-19 pandemic**

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Introduction: The Prostate Cancer Supportive Care (PCSC) Program at the Vancouver Prostate Centre provides a comprehensive program including educational sessions (ES) regarding decision-making for primary therapy, sexual health, pelvic floor physiotherapy, hormone therapy, counselling, exercise, and nutrition. In 2016, the PCSC Program opened in BC Cancer Victoria and in 2018 medical oncologists (MDs) there developed two ES addressing treatment options for metastatic hormone-sensitive (mHSPC) and metastatic castration-resistant (mCRPC) disease. Initially, MDs delivered in-person ES in Victoria. In 2019, it was also offered virtually. From March 5, 2020, the ES were on hold due to the COVID-19 pandemic and parental leaves. In June 2020, the ES resumed virtually, delivered by the PCSC oncology nurse practitioner (NP). In response to a changing standard of care for mHSPC, the two ES were consolidated in October 2020. We report on the evolution of the metastatic prostate cancer (mPCa) ES in response to these circumstances.

Methods: We prospectively collected attendance and patient characteristic metrics from all ES for men with mPCa. We prospectively collected anonymous patient satisfaction questionnaires.

Results: From January 2018 to November 2021, 121 men registered for 31 ES; 91 men, 49 partners, and three family members actually attended (Table 1). Sixty-four of 91 (70.3%) men were white, 44/91 (48%) retired, and 68/91 (74.7%) married. We held 12 mHSPC, seven mCRPC, and 12 mPCa ES. MDs presented 18 and NP 13 ES. Responses to questions on 79 satisfaction surveys were similar for MD vs. NP presenters. Seventeen of 18 responders to the mode of delivery questions said they agreed (8) or strongly agreed (9) that it was beneficial to watch the ESV on a home computer.

Conclusions: The consolidated mPCa ES was well-received, as was the virtual format. Patient satisfaction with ES was the same for MD and NP presenters. Consolidation of mHSPC and mCRPC content decreased the number of ES/month. Virtual delivery provided greater access to those living in distant areas of the province, as well as those in isolation due to COVID-19.

MP-9.15. Table 1. Attendance by site and mode of delivery

	In person only (pre-COVID)	In person and virtual (pre-COVID)	Virtual only (post-COVID)
	1/2018-7/2019	8/2019-3/2020	6/2020-11/2021
Victoria	12	22	20
Vancouver	N/A	6	17
Kelowna	N/A	9	1
Prince George	N/A	0	7
Surrey	N/A	0	1
Total	12	37	46

UP-9.1**Neutrophil-to-lymphocyte ratio as a predictor of response to abiraterone acetate in metastatic castration-resistant prostate cancer**

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Introduction: Prior work from the landmark COU302 study suggested that neutrophil-to-lymphocyte ratio (NLR) may act as a predictive biomarker of abiraterone acetate (AA) response in first-line castration-resistant prostate cancer (CRPC) patients. We assess the role of NLR as a prognostic marker for patients receiving AA as first-line treatment for CRPC.

Methods: Clinical data on all patients treated with AA for first-line CRPC at two institutions from 2013–2020 were included in this retrospective study. Clinical information was collected by chart review. Kaplan-Meier survival was compared using a log-rank test. Cox proportional hazards model assessed whether NLR group independently predicted overall survival (OS), cancer-specific survival (CSS), and length of abiraterone treatment, with adjustment for baseline variables. Based on prior work, NLR was dichotomized using a cutoff of 2.5.

Results: A total of 170 patients who received AA for first-line CRPC treatment were included. The median followup was 25.7 months. Forty-seven of 60 deaths were related to prostate cancer. The median time on abiraterone was 17 months. Thirty-five patients received chemotherapy as second-line therapy. On Kaplan-Meier analysis, OS (hazard ratio [HR] 2.24, 95% confidence interval [CI] 1.27–3.96, $p=0.005$) and CSS (HR 1.98, 95% CI 1.07–3.67, $p=0.03$) were shorter in the high NLR group, but this was not significant on multivariable analysis. Moreover, NLR group did not predict the length of abiraterone treatment, with the presence of >10 metastases and baseline prostate-specific antigen >15 ng/ml significant predictors of treatment response on univariable and multivariable analyses. However, on multivariable analysis, NLR >2.5 was the most significant risk factor (HR 2.15, 95% CI 0.98–4.70, $p=0.05$) for receipt of chemotherapy after adjustment for the presence of >10 metastases and above-normal lactate dehydrogenase.

Conclusions: Our real-world data from first-line CRPC patients do not suggest NLR is an independent biomarker of response to abiraterone, though an elevated NLR >2.5 did suggest a higher likelihood of receipt of second-line chemotherapy.

UP-9.2**Commonly used pharmacological agents and their effect on prostate cancer**

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Introduction: Prostate cancer is the second most common diagnosis of cancer among men, and the fifth most common cause of cancer-specific death worldwide. There is currently mixed evidence on the effect of certain common medications on the risk of developing prostate cancer. The primary endpoint of this study was prostate biopsy outcome in association with three commonly prescribed pharmacological agents: of 5-alpha reductase inhibitors (5-ARIs), statins, and proton-pump inhibitors (PPIs). The secondary endpoint was diagnosis of clinically significant prostate cancer.

Methods: This retrospective cohort study used the Princess Margaret Cancer Centre prostate biopsy database to include men who underwent their first diagnostic prostate biopsy from January 2018 to December 2018. Exposure was defined as six months of taking any of 5-ARIs, statins, or PPIs for patients undergoing their first prostate biopsy. Prostate cancer was defined based on a pathology report, with Gleason score (GS) of ≥ 6

as the cutoff for prostate cancer diagnosis. Clinically significant prostate cancer was defined as GS of ≥ 7 . Descriptive analyses for continuous variables, proportions for discrete variables, and comparative tests for continuous variables were used. Multivariate logistic regression with time-variable covariates was performed to control for confounders.

Results: A total of 663 patients fulfilled the inclusion criteria. Cancer diagnosis was associated with increased likelihood of PPI use (19.8% vs. 11.4%, $p=0.008$) and statin use (36.7% vs. 23.7%, $p<0.001$), older age (mean 67.3 ± 7.9 vs. 62.1 ± 8.4), higher prostate-specific antigen (mean 28.6 ± 190.6 vs. 6.1 ± 3.9 , $p=0.016$), and smaller prostate volume (mean 54.1 ± 23.3 vs. 42.9 ± 20.8 , $p<0.001$). Compared to non-PPI users, the odds of cancer diagnosis among pantoprazole users was 2.45 (95% confidence interval [CI] 1.15–5.19, $p=0.05$). Pantoprazole use was also associated with 2.3 increased odds of clinically significant cancer diagnosis (95% CI 1.26–4.19, $p=0.007$). Statin use and 5-ARI use were not associated with increased risk of prostate cancer diagnosis.

Conclusions: Our results do indicate PPI use was associated with an increased risk of developing clinically significant prostate cancer. This data highlights a continued need to elicit a thorough medication history and actively monitor PPI use in men at risk for prostate cancer. Further larger, population-based cohort and randomized studies should provide more information in this important area.

UP-9.3

How reliable are the self-reported prostate cancer medical data? Insight from the BIOCaPPE study

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Support: BIOCaPPE Network

Introduction: The BIOCaPPE clinical study (Biomarkers and Prostate Cancer/Prevention and Environment) aims to identify biomarkers of prostate cancer (PCa) risk that are modifiable by lifestyle. Enrolled participants filled out many questionnaires, including their clinical situation. However, the accuracy of patient-reported outcomes (PROs) related to PCa is unclear. Our aim was to assess the reliability of self-reported PCa medical data in comparison to validated data. Our objective is to refine PCa assessment tools and determine the usefulness of PCa-related PROs.

Methods: Targeted data on clinical events related to prostate biopsies, prostate-specific antigen (PSA) tests, and medical imaging were extracted from self-reported questionnaires of the BIOCaPPE participants, and from their respective medical charts. Data were analyzed on three aspects: declaration of a clinical event, reported date, and reported result. Non-identical information was flagged and categorized according to the corresponding type of inconsistency. A portrait of sensitivity and specificity was drawn up.

Results: Following the analysis of the 1934 questionnaires available, magnetic resonance imaging (MRI)-related PRO obtained a specificity of 84.2% and a sensitivity of 99.1% with regard to the statement of having had an MRI, its date, and its result. Of these, 1698 questionnaires were perfectly consistent for the three aspects, 23 were almost entirely consistent, 147 were consistent but incomplete, 21 were inconsistent and incomplete, and 45 were inconsistent (erroneous information, declared non-existent event, or undeclared events).

Conclusions: Self-reported PCa-related MRI data by patients of the BIOCaPPE project was consistent and reliable, with almost 90% of the questionnaires being consistent or almost entirely consistent. Similar work is needed for PSA and prostate biopsies in order to generalize the usefulness of self-reported PCa data and use such a tool in a general clinical context.

UP-9.5

Machine learning prediction of continence recovery of robotic-assisted radical prostatectomy

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Introduction: Benign prostate hyperplasia affects more than 70% of patients aged 80 years old and older and has significant implications, both social and economic, on the current healthcare system. The primary aim of this study was to develop a machine learning model to predict continence recovery at 100 days after undergoing robotic-assisted radical prostatectomy (RARP).

Methods: A retrospective review was performed on a prospectively maintained database of 1737 patients who underwent RARP for localized prostate cancer between 2007 and 2019. Different machine learning and non-machine learning approaches, including logistic regression (LR), classification tree (CT), and support vector machine (SVC) were used to build prediction models. Each method was then evaluated for its accuracy and interpretability.

Results: A total of 1376 patients were included in the explainable boosting machine (EBM) model. The model's area under precision-recall curve (PR-AUC) prediction using this method outperformed other methods, such as logistic regression (PR-AUC=0.5873), classification tree (PR-AUC=0.5668), and support vector machine (PR-AUC=0.5607). Preoperative International Prostate Symptom Score, body mass index, age, and preoperative prostate-specific antigen score, as well as clinical stage, were, in order, the most significant factors in continence recovery at 100 days.

Conclusions: Using EBM analysis confirmed and quantified the contribution to several previously described factors for continence recovery. Furthermore, we showed in this study that EBM outperforms other commonly used models, such as support vector machine and logistic regression.

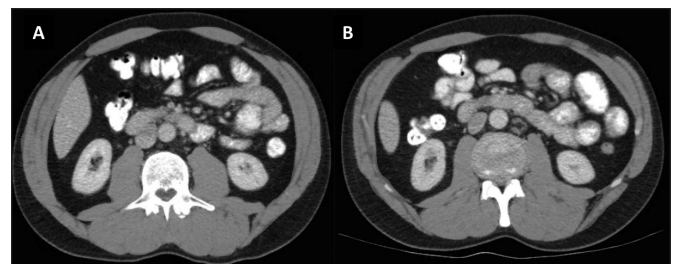
UP-9.8

A comparison of the sarcopenic effect of abiraterone and enzalutamide in the treatment of metastatic prostate cancer patients

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Introduction: Androgen deprivation therapy (ADT) is standard of care for hormone-naïve metastatic prostate cancer (hnmPCa), often in combination with androgen receptor-axis-targeted therapies (ARAT).¹ Decreased skeletal muscle mass (SMM) is a common side effect of ADT and is associated with adverse outcomes in cancer patients.² Studies have investigated the impact of ADT on SMM;³ however, few studies have investigated whether the addition of an ARAT to ADT worsens SMM decline. Herein,



UP-9.8. Figure 1. A demonstration of how skeletal muscle area was calculated using axial CT images at L3 vertebra. The images depict the same patient at two distinct time points: (A) pre-initiation of ADT; and (B) 6 months post-initiation of ADT. As can be seen, there is a noticeable decrease in skeletal mass after initiation of ADT.

UP-9.8. Table 1. Skeletal muscle index (SMI) changes of entire cohort and according to hormone therapy

Characteristic	Overall	ADT	Abiraterone	Enzalutamide	p
Total number, n	64	17	33	14	
Pre-treatment SMI (cm ² /m ²), mean (SD)	50.26 (9.44)	51.69 (8.61)	48.68 (9.01)	50.40 (10.69)	0.45
Post-treatment SMI (cm ² /m ²), mean (SD)	47.41 (8.73)	48.68 (7.57)	46.24 (8.56)	47.30 (10.05)	0.73
SMI change (%), mean (SD)	5.42% (8.58)	6.15% (9.50)	4.06% (10.22)	6.04% (6.01)	0.73
SMI change per 1000 days	8.87	6.82	7.92	11.88	0.99

we investigated the impact of ADT alone, ADT with abiraterone acetate, and ADT with enzalutamide on SMM.

Methods: This retrospective, single-center chart review included hnmPCa patients treated with ADT alone or in combination with abiraterone acetate or enzalutamide. The primary outcome was change in SMM as quantified on pre- and post-treatment computed tomography (CT) images. The Skeletal Muscle Index (SMI) was calculated using a well-established method (Figure 1).^{4,5} Patients were defined as sarcopenic if SMI was <55 cm²/kg² as per international consensus.²

Results: Sixty-four men with hnmPCa were included in our study, including 17 who were treated with ADT alone, 33 with ADT and abiraterone, and 14 with ADT and enzalutamide. Pre-treatment baseline characteristics were not significantly different. The cohort's mean followup time was 337 days, with no difference across groups. Most (75%) men were found to be sarcopenic before the initiation of ADT. In addition, 37.5% of initially non-sarcopenic patients became sarcopenic during treatment. In terms of SMI, there was a 6% decline with ADT alone, a 4% decline with abiraterone, and a 6% decline with enzalutamide (Table 1). These were not significantly different ($p < 0.05$). Even when standardized per unit time, SMI decline was not significantly different across the groups.

Conclusions: This study highlights the significant impact of ADT on SMM in patients with hnmPCa. However, the addition of an ARAT to ADT did not impact the loss of SMM.

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UP-9.9

A phase 1 clinical study in early-stage, treatment-naive prostate cancer patients with ORCA-010, a replication competent oncolytic adenovirus

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Introduction: Oncolytic adenoviruses are promising immunotherapeutic agents for the treatment of cancer. Considering the role of the host immune system, treatment-naive patients with early-stage localized prostate cancer were enrolled in a phase 1 trial with ORCA-010. ORCA-010 is a potency enhanced oncolytic replication competent adenovirus, developed to be specifically infect and kill cancer cells.

Methods: Treatment-naive prostate cancer patients with localized disease were treated with a single intratumoral administration of ORCA-010. Nine patients in three dose escalation cohorts (1x10¹¹, 1x10¹² or 1.5x10¹² viral particles/administration) were treated based on a 3+3 design with a one-year followup period. The primary study objectives included the safety profile and tolerability of intratumoral administration. Secondary objectives included: 1) evaluation of the biological activity and antitumor efficacy of intratumoral administration; 2) evaluation of potential antitumor responses; and 3) assessment of shedding of ORCA-010.

Results: Nine patients with localized prostate cancer were treated with a single intratumoral administration of ORCA-010. Treatment-related adverse events were limited to transient grade I and grade II adverse events. Shedding analyses demonstrated active replication of ORCA-010 post-administration and a viremia peak was observed in all patients within one week post-administration. Prostate-specific antigen (PSA) levels increased significantly post-administration, coinciding with ORCA-010 DNA levels, and returned to pre-administration levels at 1–3 months. Preliminary analyses of the magnetic resonance imaging data in patients demonstrated a significant reduction of prostate size six months post-treatment and reduced tumor load.

Conclusions: Intratumoral administration of ORCA-010 in treatment-naive prostate cancer patients demonstrated an excellent safety profile. Preliminary analyses demonstrate viral replication post-administration, encouraging anti-tumor activity, and prostate size reduction in prostate cancer patients with enlarged prostates.

UP-9.10

Clinical and biochemical predictors of skeletal-related events at the time of diagnosis of castrate-resistant prostate cancer

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Introduction: Skeletal-related events (SRE) are associated with poor survival and quality-of-life in patients with castrate-resistant prostate cancer (CRPC). The objective of this study is to identify early risk factors for SRE in a contemporary-treated cohort of CRPC patients.

Methods: Patients diagnosed with CRPC at our institution from 2012 to 2019 were retrospectively reviewed. All patients were managed by a dedicated uro-oncologist. The primary outcome was the first occurrence of an SRE, defined as radiographic evidence of pathologic fracture, spinal cord compression, or need for bone radiotherapy. A multivariable Cox model was used to identify the strongest predictors of time to SRE.

Results: A total of 230 patients were included in our study (Table 1). Median follow-up was 17.6 months (interquartile range 8.7-32.3 months), during which 107 patients (47%) developed SREs. On multivariable analysis, presence of metastases at diagnosis (HR 3.587), higher PSA (HR 1.001), LDH (HR 1.001), and ALP (HR 1.001) were associated with increased risk of SREs. The area under the curve (AUC) for this model was 0.70.

UP-9.10. Table 1. Multivariable Cox proportional hazards model for time to SRE from initial CRPC diagnosis

Variable	n (%) or mean±SD	HR (95% CI)	p
Primary treatment			
ADT	88 (38.3)	1.0	-
Surgery	23 (10.0)	0.811 (0.389–1.693)	0.58
Radiation	79 (34.3)	0.901 (0.564–1.438)	0.66
Surgery + radiation	28 (12.2)	0.793 (0.385–1.631)	0.53
Chemotherapy	12 (5.2)	2.000 (0.983–4.067)	0.06
PSA (ng/mL, median)	13.9	1.001 (1.000–1.001)	0.03
Metastases at diagnosis (mCRPC)	184 (80.0)	3.587 (1.772–7.263)	<0.01
Hb (g/L)	124±17	1.000 (0.986–1.015)	0.99
Albumin (g/L)	39±5	0.969 (0.919–1.022)	0.25
LDH (U/L, median)	450	1.001 (1.000–1.001)	0.01
ALP (U/L, median)	96	1.001 (1.000–1.002)	0.01
Neutrophil-to-lymphocyte ratio	3.39±2.72	1.008 (0.945–1.075)	0.81

Conclusions: We identified several clinical and biochemical predictors available at CRPC diagnosis that are associated with increased risk of SREs. A high degree of clinical scrutiny is warranted in such patients, and early bone directed therapies should be instituted. This work supports earlier introduction of androgen receptor axis therapies to delay the progression to mCRPC and to improve quality of life.

UP-9.11**Extensive alteration of androgen precursor levels after castration in prostate cancer patients and their association with active androgen level: Importance for treatment intensification**

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Introduction: Dihydrotestosterone (DHT) and testosterone are thought to be major contributors of prostate cancer progression and resistance. We studied the modulation of 15 circulating steroids induced by castration and their association with DHT and testosterone levels.

Methods: A total of 116 serum samples were collected from 99 prostate cancer patients and categorized either as eugonadal, castration-sensitive (CSPC), castration-resistant (CRPC), or CRPC under abiraterone acetate. Serum levels of 15 steroids were measured using mass spectrometry and compared between groups using ANOVA. Inpatient association of steroid levels and the androgens testosterone and DHT were assessed using Pearson correlation and linear regression.

Results: Testosterone, DHT, androstenedione, dehydroepiandrosterone, dehydroepiandrosterone-sulfate, androsterone, androstenediol, estrone, estrone-sulfate, estradiol, and androsterone/3 α -diol-3/3 α -diol-17-glucuronide levels were significantly decreased in CSPC (castrated) compared to eugonadal patients. Testosterone levels were strongly associated with multiple steroids under eugonadal conditions, whereas they were sparsely affected by precursor steroids in castrated patients. By contrast, DHT levels under androgen deprivation therapy (ADT) were associated with testosterone and the backdoor pathway metabolite androsterone. In CRPC patients, levels of androstenedione were significantly associated with testosterone level, while testosterone was the only steroid that predicted DHT levels.

Conclusions: ADT significantly reduces the levels of 13 circulating steroids. Upon ADT initiation, the backdoor pathway metabolite androsterone strongly predicted DHT levels. Under CRPC conditions, androstenedione was significantly associated with testosterone levels, suggesting the presence of tumor-related circulating androgens in these patients. These results provide further rationale to intensify treatments with androgen receptor axis signaling pathway inhibitors in patients with prostate cancer.