Predictors of failed same-day discharge in patients undergoing robot-assisted radical prostatectomy at a Canadian center

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Introduction: Same-day discharge (SDD) after robot-assisted radical prostatectomy (RARP) has been shown to be feasible and safe in centers outside of Canada; however, heterogeneity exists in the inclusion criteria for those offered SDD in published literature. Our objective was to determine patient-specific and intraoperative predictors for failure of SDD for patients undergoing RARP at a Canadian center.

Methods: A retrospective review was conducted of patients undergoing RARP at a Canadian tertiary academic center from May 2021 to May 2023. Multivariate regression analysis determined predictors for non-initiation and failure of SDD (GraphPad Prism, Boston, MA, U.S.).

Results: We identified 387 patients, of whom 201 (51.9%) were initiated on the SDD pathway. Of those initiated, 104 (51.7%) were successfully discharged home the same day. Patients who traveled distances >100 km or who had obstructive sleep apnea (OSA) were significantly less likely to be initiated on the SDD pathway (all p > 0.05). Of those initiated on the SDD pathway, cases that were scheduled to be second or later, had an estimated blood loss ≥ 300 mL, or had a postoperative abdominal drain resulted in an increased likelihood of failing SDD after initiation. Operative time and ASA ≥ 3 had no significant relationship with failing SDD (all p > 0.05).

Conclusions: We found that patients who live a greater distance from the hospital or who have a medical history of OSA are predictive of not being initiated on the SDD pathway. Of those initiated, postoperative abdominal drains, increased intraoperative blood loss, or being the second/third case of the day are more likely to fail SDD. The results of this study inform potential inclusion and exclusion criteria for SDD pathways being developed in Canada.

Predictors of non-initiation and failure of SDD

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Odds Ratio (95% CI)</th>
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<th>Odds Ratio (95% CI)</th>
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<td>Age ≥ 65 (years)</td>
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<td>BMI ≥ 30 (kg/m²)</td>
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<td>ASA ≥ 3</td>
<td>0.87 (0.51–1.48)</td>
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<td>1.25 (0.59–2.66)</td>
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<td>OSA</td>
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<td>1.51 (0.65–3.51)</td>
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<td>Distance ≥ 100 km</td>
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<td>Second case or earlier</td>
<td>1.32 (0.86–2.01)</td>
<td>0.207</td>
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<tr>
<td>Operative time ≥ 150 (min)</td>
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<td>–</td>
<td>2.04 (0.70–5.91)</td>
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<td>Postoperative drain</td>
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<td>3.22 (1.18–8.75)</td>
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<td>EBL ≥ 300 (mL)</td>
<td>–</td>
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<td>2.33 (1.26–4.29)</td>
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Predictors of non-initiation and failure of SDD


Introduction: Radical prostatectomy for prostate cancer (PCa) requires clear surgical margins and, when possible, maintaining sexual function. Stimulated Raman histology (SRH), a real-time imaging technique interpretable by artificial intelligence (AI), offers rapid assessment of fresh, unprocessed tissues, potentially improving surgical decision-making and nerve-sparing approaches.

Methods: The IRB-approved study focused on intraoperative surgical margin assessments using SRH and postoperative analysis with a convolutional neural network (CNN). In the study, 22 men underwent robotic-assisted laparoscopic radical prostatectomy, with 121 intraoperative margin assessments using SRH, providing high-resolution images of fresh, unstained samples taken from the surgical bed. Real-time analysis by the surgical team identified cancer in the surgical bed samples, leading to immediate re-resection where PCa was detected. A CNN for prostate biopsy SRH was retrained on 57 margins from 12 patients and tested on 64 margins from 10 participants for margin analysis. The CNN’s accuracy, sensitivity, and specificity were compared against final H&E-stained histopathology.

Results: SRH-identified cancer in five prostate bed samples from three participants, prompting re-resection for a wider margin. Postoperative CNN analysis, taking 1–2 minutes per scan, accurately differentiated benign and malignant prostate bed samples. Mean CNN tumor probability predictions for benign samples were 0.3% (IQR 0.2–0.45%) and 25.8% (IQR 10–41.8%, p = 0.00001) for cancer-bearing samples. The CNN achieved 100% accuracy, sensitivity, and specificity in identifying cancer in margin samples as compared to permanent histologic evaluation of the samples. Moreover, 50% of participants with positive surgical margins on final surgical pathology were identified intraoperatively using SRH combined with CNN interpretation.

Conclusions: SRH, coupled with AI, provides a promising method for real-time surgical margin assessment in radical prostatectomies, enhancing nerve-sparing surgery accuracy and potentially reducing recurrence risks. Ongoing research is needed to fully establish SRH’s oncologic and functional benefits.

Acknowledgements: NIH ULI TR001445 and R01CA226527-01
mCRPC patients showing evidence of disease progression were 1, 2, 14, 3, 1, 2.

The significant p-value for surgical margins classified as negative or positive by the AI CNN interpreting SRH. The mean tumor prob using AI interpreted SRH. The box plot represents the distribution of tumor prediction percentages MP 1.2. Figure 1.

perineural invasion, while B1 shows benign peri-prostatic tissue: green=benign, red=tumor, and purple=non-AI overlays (A1, B1). A1 shows a positive surgical margin with ISUP grade group 2 prostate cancer and are areas of interest. For each marked area, there are corresponding SRH images (A, B) and SRH with


MP 1.3 Intra-patient inter-metastatic heterogeneity in mCRPC patients determined by triple-tracer PET imaging, prevalence, and survival correlation with imaging phenotypes: The 3TMPO cohort study

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Introduction: Intra-patient inter-metastatic heterogeneity (IIH) has been demonstrated in metastatic castration resistant prostate cancer (mCRPC) patients and is of utmost importance for radioligand therapy (RLT) eligibility and biopsy-based precision medicine. This study was designed to determine the prevalence of IIH in mCRPC patients through a triple-tracer positron emission tomography (PET) imaging strategy and to determine their eligibility for RLT.

Methods: mCRPC patients showing evidence of disease progression were enrolled and underwent both 18F-FDG and 68Ga-PSMA-617 PET/CT scans. A third scan with 68Ga-DOTATATE was performed if a FDG-positive/PSMA-negative lesion was found. For each tracer, positivity was prespecified as lesion uptake being greater than 1.5× liver uptake. IIH prevalence was the primary outcome and defined as the percentage of participants having at least two lesions with discordant features on multitracer PET.

Results: Ninety-eight eligible participants underwent FDG and PSMA-PET/CTs. IIH was observed in 81 patients (82.7%) based on prespecified PET criteria, and at least one FDG-positive/PSMA-negative lesion was found in 45 patients (45.9%). Seven different combinations of lesion imaging phenotypes were observed based on FDG and PSMA PETs. Of the 37 participants who also underwent 68Ga-DOTATATE-PET/CT, six (16.2%) had at least one DOTATATE-positive lesion. In this subgroup, eight different combinations of lesion imaging phenotypes were observed. Based on our prespecified criteria, 52 (53.1%) participants were determined to be eligible for PSMA-RLT but none for DOTATATE-RLT. Patients with IIH had significantly shorter median overall survival (OS) when compared to patients without IIH (9.5 months vs. not reached; log-rank p=0.03, HR 2.7, CI 1.1–6.8). In patients with at least one FDG-positive/PSMA-negative lesion, finding a DOTATATE-positive lesion was associated with significantly poorer median OS (3.0 vs. 6.4 months, log-rank p=0.0004, HR 5.1, CI 1.9–13.7).

Conclusions: The majority of mCRPC patients showed IIH, which was associated with shorter OS. Based on a triple-tracer PET approach, multiple phenotypic combinations were found. Correlation of these imaging phenotypes with genomics and treatment response will be relevant for precision medicine.

Acknowledgements: Oncopole EMC2 funding through a peer-review process.

MP 1.2. Figure 1. Comparison of tumor prediction in percentages in negatives and positive surgical margins using AI interpreted SRH. The box plot represents the distribution of tumor prediction percentages for surgical margins classified as negative or positive by the AI CNN interpreting SRH. The mean tumor probability for negative surgical margins is markedly lower compared to positive surgical margins, with the red box indicating a substantial increase in tumor prediction percentages for the latter. The significant p-value <0.0001 indicates a statistically meaningful difference between the two groups.

MP 1.2. Figure 2. Intraoperative margin assessment with SRH and AI overlay. This figure represents a participant who underwent a SRH surgical margin assessment during a radical prostatectomy. The left panel shows an intraoperative image of the prostate resection bed with two areas marked A and B, which are areas of interest. For each marked area, there are corresponding SRH images (A, B) and SRH with AI overlays (A1, B1). A1 shows a positive surgical margin with ISUP grade group 2 prostate cancer and perineural invasion, while B1 shows benign peri-prostatic tissue: green=benign, red=tumor, and purple=non-diagnostic areas.
Incidence of second malignancies in prostate cancer patients treated with low-dose-rate brachytherapy and radical prostatectomy at extended followup

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Introduction: Second malignant neoplasia (SMN) is a rare but potentially lethal event after prostate brachytherapy (BT) but data remain scarce on its long-term risk. The primary objective of this study was to estimate the risk of pelvic SMN in patients treated with BT monotherapy compared to radical prostatectomy (RP) (alone or with adjuvant/salvage external beam radiation therapy (EBRT)). Secondary objectives included estimation of the incidence of invasive pelvic SMN, any SMN (pelvic and extrapelvic), and survival from any subsequent malignancy between cohorts.

Results: A total of 2378 brachytherapy and 9089 prostatectomy patients were included. The median age was 66 (IQR 61–71) years and 63 (IQR 58–67) years, respectively. Median followup was 14 (IQR 11.5–17.3) years. The absolute risks of pelvic second malignancy at 15 and 20 years were 6.4% and 9.8% after brachytherapy, and 3.2% and 4.2% after prostatectomy, respectively. Time to any second malignancy and time to death from any second malignancy were not significantly different (p>0.05). On Cox multivariable analysis, brachytherapy compared to surgery was an independent risk factor for pelvic (HR 1.81, 95% CI 1.45–2.26, p<0.0001) and invasive pelvic second malignancy (HR 2.13, 95% CI 1.61–2.83, p<0.0001). Increased age and smoking were also associated with increased risks (p<0.05).

Conclusions: After adjustment for age and smoking status, a significant increased risk of pelvic and invasive pelvic second malignancy in patients treated with brachytherapy compared to radical prostatectomy was noted, even with inclusion of patients who had adjuvant/salvage EBRT.

Monitoring lethal prostate cancer through genomic alterations in primary tumors and circulating tumor DNA

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Introduction: Prostate cancer (PCa) is a major cause of cancer deaths worldwide. Although curative therapies increase survival, recurrence is inevitable in 25–35% of patients. Markers detecting key modifications are needed to better control disease progression. This study aimed to identify alterations in primary tumors of patients with lethal PCa and shared/exclusive changes in circulating tumor (ct)DNAs.

Methods: Banked fresh frozen prostate (n=25) from radical prostatectomy (RP) cases were processed to identify tumor foci and macro-dissect cores of high cellularity (>75%) for DNA extraction. Plasma samples collected at four timepoints (0/prior RP, 33, 43, and 52 months) from one lethal case were used to isolate cell-free (cf)DNA using the QIAamp Kit, after optimization. Whole genome sequencing (WGS) of tumor and matched germline (blood) DNA, and of ctDNAs was performed at 100×, 40×, and 170× depths, respectively. Sequencing files were processed using an adapted GenPipe DNA-seq pipeline to call mutations in coding regions, copy number variations (CNVs), and fusions. An in-house Python script was developed to filter alterations and find shared/exclusive modifications.

Results: Already established PCa-CNVs were found in our cases, notably losses in PTEN (72%), NKKX3-1 (68%), TP53 (48%), and RB1 (32%), and gains in MYC (40%) and NCOA2 (32%). Also, deletions in 11p15.5 (84%) containing MRPL23, H19 genes and 21q22.3 (80%) harboring tumor suppression gene (SIK1) were discovered. A new genomic loss at 22q12.11 (44%) containing genes involved in PCa cell survival (PRODH) was detected. In the patient whose ctDNAs were sequenced during his entire trajectory, 52 somatic mutations were identified in the tumor, of which 27 were found in ctDNAs. The ctDNA fraction was very low at RP and increased over time. Somatic mutations in PCa-related genes (PRSS3, FOLH1, KMT2C) were differentially detected in tumors vs. ctDNAs. Eight other mutations and CNVs promoting neuroendocrine and stem-like cell phenotypes were only detected in the last ctDNA prior to death, supporting a representation of cell cycle, DNA repair, and senescence processes.

Conclusions: Our findings pinpoint recurrent and new genomic alterations in patients with severe disease. The ctDNA data support the importance of liquid biopsy to monitor progression. The identification of novel genomic changes in

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cDNAs may improve our understanding of lethal PCa and lead to the development of novel tests and more effective treatments.

Acknowledgements: The authors would like to thank the patients who donated samples for this study; the Marathon of Hope Canadian Cancer Network (Health Canada)Terry Fox Research Institute, CIHR Male Health Research Network, Urology 2021 Cancer Control Canada; and Compute Canada (www.computecanada.ca).
The presence of cribriform morphology on RP specimens of patients with biochemical recurrence post-radical prostatectomy (RP) is associated with presence of metastasis on PSMA-PET/CT and a distinct pattern of spread.

**Methods**: We conducted a cross-sectional analysis of all prostate cancer patients with biochemical recurrence post-RP undergoing an [18F-DCFPyL]-PET/CT between December 2018 and February 2021 at The Princess Margaret Cancer Centre. Outcomes were the presence of any metastasis in the overall cohort and lymphatic vs. bone/visceral metastases among patients with metastatic disease. The associations between intraductal (IDC) and/or invasive cribriform carcinoma (ICC) presence on the RP specimen and study outcomes were evaluated using logistic regression analyses.

**Results**: The cohort included 176 patients. IDC and ICC were observed in 77 (43.8%) and 80 (45.5%) RP specimens, respectively. The median time from RP to PSMA-PET/CT was 5.0 years. Median serum PSA at PSMA-PET/CT was 1.12 ng/mL. Overall, metastasis was observed in 77 patients, of which 58 were lymphatic-only. On multivariable analysis, the presence of IDC on RP was associated with increased odds of overall metastasis (OR 2.17, 95% CI 1.07–4.43, p=0.033). The presence of ICC on RP was associated with significantly increased odds of lymphatic versus bone/visceral metastases (OR 3.13, 95% CI 1.09–21.7, p=0.004).

**Conclusions**: The presence of cribriform morphology on RP specimens of patients with biochemical failure post-RP is associated with increased odds of PSMA-PET/CT-detected metastases with a lymphatic-predominant pattern of spread. These findings have implications for the design and evaluation of post-RP salvage therapies.

### MP 1.9

**Third interim analysis (IA3) of the DARolutamide Observational (DAROL) study in patients with non-metastatic castration-resistant prostate cancer**

**Geoffrey Gatto**, Hiroyoshi Suzuki, Munio Luz, Alberto Brigantti, Evan Y. Yu, Christopher Pieczonka, Declan Murphy, Ryan Malone, Joelle Hamilton, Jonathan E. Chan, Paul Seiber, Robert W. Goven, Patrick Adorni, Mercedeh Ghassadi, Frank Verholen, Andrew J. Armstrong


**Introduction**: In ARAMIS (NCT02200614; phase 3), darolutamide (DARO) significantly improved metastasis-free survival (MFS) by approximately two years and reduced the risk of death by 31% vs. placebo in patients (pts) with non-metastatic castration-resistant prostate cancer (nmCRPC), with favorable safety signals in this prespecified IA3. The DAROL study (NCT04122976) is assessing the real-world safety and effectiveness of DARO in pts with nmCRPC. We report results from the prespecified IA3.

**Methods**: DARO is an ongoing, global, open-label, single-arm, non-interventional study in pts aged ≥18 yrs with nmCRPC for whom the decision to be treated with DARO was decided pre-enrollment. The primary endpoint is safety, including incidence and severity of treatment-emergent adverse events (TEAEs), Secondary endpoints include MFS, overall survival (OS), prostate-specific antigen (PSA) progression, and PSA response. Prespecified IA3 was conducted when 550 pts completed ≥6 mo of treatment (data cutoff July 17, 2023).

**Results**: Of 550 treated pts, 36%, 28%, 23%, 12%, and 2% were from Europe, Asia Pacific, the U.S., Canada, and Latin America, respectively. Median age was 79 yrs (IQR 73–84); 48.5% had a Gleason score ≥8, 80.7% had ECOG performance status 0/1. Median baseline PSA was 4 ng/mL (IQR 2.3–9.3), and 18.7% of pts had PSA <2 ng/mL. Median PSA doubling time (PSADT) was 5.3 mo (IQR 3.1–8.9), and 175/394 pts (44.4%) with evaluable PSADT had PSADT ≥6 mo. Median followup was 16.5 mo (IQR 12.5–21.1) and median treatment duration was 14.9 mo (IQR 10.4–20.9). Incidences of TEAEs and DARO-related TEAEs were generally low (Table 1). OS and MFS rates at two years were 87.6% (95% CI 82.3–91.4) and 78.3% (95% CI 72.7–83.0), respectively; PSA progression-free rate at two years was 85.3% (95% CI 79.5–89.5), and 76.0% and 53.8% of pts had PSA50 and PSA90 responses, respectively, at any time. Canadian data to be presented in the poster.

**Conclusions**: In DAROL, MFS, OS, and PSA outcomes indicated effectiveness in the real-world setting, consistent with ARAMIS. Darolutamide showed no new safety signals in this prespecified IA3.

**Acknowledgements**: Funding source: Bayer AG Pharmaceuticals. Previously presented at © 2024 American Urological Association. Reused with permission. This abstract was accepted and previously presented at the 2024 AJA Annual Meeting. All rights reserved.

### MP 1.10

**Screening of metabolic, cardiac, and bone health in prostate cancer patients on androgen deprivation therapy: A population-based assessment of adherence to therapeutic monitoring guidelines**


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**Introduction**: Androgen deprivation therapy (ADT) remains a part of the standard of care for men with advanced prostate cancer. American, Canadian, and European Urologic Associations (AU/CA/EUA) suggest regular metabolic monitoring for men on ADT. Surveys of ADT providers have revealed varying adherence to monitoring guidelines. We explored the prevalence and predictors of adherence to monitoring guidelines in this population.

**Methods**: We conducted a retrospective cohort study using administrative data sources in Ontario, Canada (Institute for Clinical Evaluative Sciences) from 2008–2021. We identified all men receiving ADT for prostate cancer. The primary outcomes were the use of bone density testing, bone health serum testing, and adherence to monitoring guidelines.
lipid testing, and glucose/diabetes testing between six weeks preceding and one year following initiation of ADT. Secondary outcomes included predictors of adherence. Binomial logistic regressions were primarily used to analyze data.

**Results:** We examined 29,097 patients of whom 52.8% were prescribed ADT by urologists, 37.9% by radiation oncologists, 2.8% by medical oncologists, and 2.4% by other physicians. Adherence to therapeutic screening guidelines was generally low; only 21.3% of patients received a bone density scan; 41.2% underwent bone health-related serum tests; 51.3% had a lipid profile completed; and 65.9% underwent blood sugar screening. ADT prescription by a medical oncologist was associated with a lower likelihood of undergoing screening tests for plasma glucose (RR 0.78, 95% CI 0.64–0.96, p=0.02), lipids (RR 0.65, 95% CI 0.59–0.80, p=0.02), and blood sugar (RR 0.69, 95% CI 0.59–0.80, p=0.009) within a year when compared to prescription by urologists. Increasing patient age was associated with lower adherence to screening guidelines for lipids (RR 0.26, 95% CI 0.12–0.62, p=0.002) and bone health (RR 0.37, 95% CI 0.17–0.83, p=0.016). Trends in adherence to screening guidelines did not significantly change with increased duration of time on ADT.

**Conclusions:** Adherence to therapeutic screening guidelines for men on ADT was poor across all provider specialties. Increasing age was associated with a significant reduction in likelihood of lipid and bone health screening. Further study is required to identify and address barriers to therapeutic monitoring of men on ADT and reduce treatment associated adverse events.

**MP 1.11**

**Integrating clinical data and FDG-PET/CT imaging with a multi-task machine learning model to predict outcomes in high-grade prostate cancer**

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**Introduction:** We aimed to develop an automated multi-task prognostic model that combines clinical data with radiomics from positron emission tomography (PET) with 18F-fluorodeoxyglucose (FDG) combined with computed tomography (CT), eliminating the need for manual segmentation while providing clinically interpretable results. This is the first study of its kind using radiomics in prostate cancer that describes long-term clinical outcomes.

**Methods:** We included 951 individuals with high-grade prostate cancer (Gleason score ≥8) who underwent radical prostatectomy (RP) and FDG-PET/CT imaging preoperatively at our tertiary care health center. Clinical data (CD), including age, prostate-specific antigen (PSA) level, clinical stage, and Gleason grade, were collected. Six prognostic tasks were defined, including lymph node invasion (LNI), biochemical recurrence (BCR)-free survival (FS), metastasis-free survival (MFS), definitive androgen deprivation therapy (dADT)-FS, castration-resistant prostate cancer (CRPC)-FS, and prostate cancer-specific survival (PCSS). A Bayesian sequential network (BSN), a dynamic prediction model quantifying uncertainty and adapting over time as outcomes from prior tasks unfold, was developed. It was compared over time as outcomes from prior tasks unfold, was developed. It was compared to commonly used nomograms (MSKCC and CAPRA-S). Performance metrics over time as outcomes from prior tasks unfold, was developed. It was compared to commonly used nomograms (MSKCC and CAPRA-S). Performance metrics for predicting BCR-FS (CI=63.5% [MSKCC] vs. 59.2%), CRPC-FS (CI 67.6% [CAPRA-S] vs. 65.6%), and PCSS (CI 87.8% [MSKCC] vs. 78.0%).

**Results:** At baseline, 66 (48–80) years. Median PSA was 7.4 (1.1–155.3). A total of 230 (88%) and 31 (12%) had clinical T1-T2 and T3a disease, respectively. At RP, 86 (29%) had LNI. 8) who underwent radical prostatectomy (RP) and FDG-PET/CT imaging preoperatively at our tertiary care health center. Clinical data (CD), including age, prostate-specific antigen (PSA) level, clinical stage, and Gleason grade, were collected. Six prognostic tasks were defined, including lymph node invasion (LNI), biochemical recurrence (BCR)-free survival (FS), metastasis-free survival (MFS), definitive androgen deprivation therapy (dADT)-FS, castration-resistant prostate cancer (CRPC)-FS, and prostate cancer-specific survival (PCSS). A Bayesian sequential network (BSN), a dynamic prediction model quantifying uncertainty and adapting over time as outcomes from prior tasks unfold, was developed. It was compared over time as outcomes from prior tasks unfold, was developed. It was compared to commonly used nomograms (MSKCC and CAPRA-S). Performance metrics for predicting BCR-FS (CI=63.5% [MSKCC] vs. 59.2%), CRPC-FS (CI 67.6% [CAPRA-S] vs. 65.6%), and PCSS (CI 87.8% [MSKCC] vs. 78.0%).

**Conclusions:** Trends in adherence to screening guidelines did not significantly change with increased duration of time on ADT.

**Conclusions:** Adherence to therapeutic screening guidelines for men on ADT was poor across all provider specialties. Increasing age was associated with a significant reduction in likelihood of lipid and bone health screening. Further study is required to identify and address barriers to therapeutic monitoring of men on ADT and reduce treatment associated adverse events.

**MP 1.12**

**Causes of death in prostate cancer patients after initial treatment with radical prostatectomy or radiation therapy**

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**Introduction:** We evaluated the causes of death in a cohort of prostate cancer (PCa) patients who underwent radical prostatectomy (RP), external beam radiation therapy (EBRT), or EBRT combined with brachytherapy (BT).

**Methods:** The study population consisted of 32,772 men who underwent RP, EBRT, or EBRT+BT between 2000 and 2016. A cohort study was constructed using Quebec administrative databases (Med-Echo and RAMQ). Included men were diagnosed and treated for PCa from 2000–2016. Followup ended at the earliest of the following: death; or December 31, 2016. Inverse probability of treatment weighting (IPTW) based on a propensity score was used to control for potential confounding. IPTW-Cox proportional hazards models were used. Four death categories were defined: 1) PCa-specific death; 2) PCa not well-defined death; 3) cardiovascular disease death; and 4) other causes of death.

**Results:** Compared to RP, the risk increased significantly with EBRT for PC-specific death (HR 3.19, 95% CI 2.85, 3.35), PCa not well-defined death (HR 1.97, 95% CI 1.78, 2.18), cardiovascular disease death (HR 1.27, 95% CI 1.27, 1.45), and other causes of death (HR 1.44, 95% CI 1.31, 1.59). For patients receiving EBRT+BT, the risk diminished significantly for PCa-specific death (HR 0.59, 95% CI 0.47, 0.74) and other causes of death (HR 0.74, 95% CI 0.58, 0.95); but not for PCa not well-defined death (HR 0.84, 95% CI 0.66, 1.06) nor cardiovascular disease death (HR 0.81, 95% CI 0.60, 1.08). In the EBRT group, the mortality was higher than in the RP group (59.5 vs. 52.1 within 16 years). Furthermore, most deaths were due to PCa (39.1%), while most patients in the RP group died of other causes, other cancers, or CVD-related (31.6%).

**Conclusions:** This study found an increased mortality risk in all categories for PCa patients in the EBRT group compared to the RP group. In the EBRT group, most deaths were due to PCa, while in the RP group, most patients died of other causes. The risk of PCa-specific and other causes of death diminished significantly for patients receiving EBRT+BT compared to patients who had undergone RP.

**MP 1.13**

**Accurate risk models with and without magnetic resonance imaging features and digital rectal examination findings to predict clinically significant prostate cancer before prostate biopsy**

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**Introduction:** Most men with prostate cancer (PCa) have low-risk, indolent disease, but men with clinically significant disease (cSPca) are at risk of disease progression and adverse outcomes. Identifying cSPca while avoiding unnecessary biopsies with low-risk PCa is a challenge. The decision to biopsy relies on available clinical data, including magnetic resonance imaging (MRI) and digital rectal exam (DRE) data. This study aimed to create accurate predictive models for patients receiving EBRT+BT compared to patients who had undergone RP.

**Methods:** Optimized ensembles of calibrated random forest models predicting grade group ≥2 used total PSA, free PSA, prior negative biopsy status, and age, with or without DRE and MRI data (prostate volume and PI-RADS score). Risk models were derived (training cohorts n=1257–2191) and validated (validation cohorts n=317–1257) from different clinical sites (Table 1). Models were evalu-
The created risk models provide high accuracy and improved UA, TUH ≥17 52 37 94 UCLA, UC, JHU NPP 1626 95 51 Yes +DRE/-MRI ≥25 -DRE/-MRI 56 94 0.89 0.87 No -DRE/+MRI Threshold 95 No 89 89 89 Yes 0.82 0.87 52 37 35 56 94 UCLA, UC, JHU PPV 1626 0.80 +DRE/+MRI Sens 0.82 Spe 0.89 No 89 89 89 Yes 0.82 0.87 52 37 35 56 94 UCLA, UC, JHU ROC AUC 1257 Yes -DRE/+MRI ≥25 3% higher specificity than -DRE -MRI for both the training and validation cohorts. Including MRI features in the models significantly increased the AUC in the validation cohort (AUC 0.80 vs. 0.87). DRE was moderately useful for models without MRI features (AUC 0.80 vs. 0.82) and had a minor value for models with MRI features (AUC 0.87 vs. 0.87; specificity 45% vs. 47%) (Table 1). Conclusions: The created risk models provide high accuracy and improved specificity for predicting csPCa in a variety of clinical settings. Including MRI features greatly increased model accuracy. Better stratification can maximize specificity for predicting csPCa in a variety of clinical settings. Including MRI features prostate volume and PI-RADS score

<table>
<thead>
<tr>
<th>Training cohort</th>
<th>MRI (prostate volume &amp; PI-RADS)</th>
<th>Clinical sites</th>
<th>Patient number</th>
<th>ROC AUC</th>
<th>Threshold</th>
<th>Sens</th>
<th>Spe</th>
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<tr>
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<td>0.80</td>
<td>≥25</td>
<td>94</td>
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<td>0.82</td>
<td>≥25</td>
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<td>1626</td>
<td>0.89</td>
<td>≥17</td>
<td>96</td>
<td>45</td>
<td>56</td>
<td>94</td>
<td>-DRE/+MRI</td>
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<tr>
<td>Yes</td>
<td>Yes</td>
<td>UCLA, JHU</td>
<td>1626</td>
<td>0.89</td>
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<td>96</td>
<td>46</td>
<td>56</td>
<td>94</td>
<td>+DRE/+MRI</td>
</tr>
</tbody>
</table>

Validation cohort

| No               | No                              | UA, TUH        | 1257           | 0.80   | ≥25      | 95   | 32  | 52  | 89  | -DRE/-MRI  |
| Yes              | No                              | UA, TUH        | 1257           | 0.82   | ≥25      | 95   | 35  | 54  | 91  | +DRE/-MRI  |
| No               | Yes                             | TUH            | 317            | 0.87   | ≥17      | 95   | 45  | 50  | 94  | -DRE/+MRI  |
| Yes              | Yes                             | TUH            | 317            | 0.87   | ≥17      | 95   | 47  | 51  | 94  | +DRE/+MRI  |

All models used PSA, free PSA, age, and prior negative biopsy status.

Results: When using a 25% threshold for predicting grade group ≥2 PCa, the model without data on DRE/MRI results had sensitivity and specificity values of 94% and 34%, respectively, in the training cohort, and 95% and 32%, respectively, in the validation cohort. At the same 25% threshold, +DRE -MRI had 3% higher specificity than -DRE -MRI for both the training and validation cohorts. Including MRI features in the models significantly increased the AUC in the validation cohort (AUC 0.80 vs. 0.87). DRE was moderately useful for models without MRI features (AUC 0.80 vs. 0.82) and had a minor value for models with MRI features (AUC 0.87 vs. 0.87; specificity 45% vs. 47%) (Table 1).

Conclusions: The created risk models provide high accuracy and improved specificity for predicting csPCa in a variety of clinical settings. Including MRI features greatly increased model accuracy. Better stratification can maximize specificity for predicting csPCa in a variety of clinical settings. Including MRI features prostate volume and PI-RADS score.

Table 1. Risk models predicting clinically significant prostate cancer (grade group ≥2) with and without DRE findings and the MRI features prostate volume and PI-RADS score

**MP 1.14**

Enhancing urologic function and physical fitness in prostate cancer survivors: Outcomes from a 28-day Prostate Cancer-Patient Empowerment Program (PC-PEP)

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**Introduction:** Prostate cancer survivors commonly experience urinary, bowel, and erectile dysfunctions post-treatment, which significantly impact their physical and mental health. This study evaluates the effectiveness of a 28-day Prostate Cancer-Patient Empowerment Program (PC-PEP) in improving urologic and physical health outcomes.

**Methods:** Thirty prostate cancer patients from the Maritimes, Canada, participated in the 28-day PC-PEP feasibility trial. The study measured physical health through anthropometric, aerobic, strength, and flexibility tests, and urologic function using the Expanded Prostate Cancer Index Composite (EPIC), both before and after the intervention. A priori paired t-tests were conducted for EPIC variables and repeated-measures ANOVA was used to assess physical fitness outcomes.

**Results:** Significant improvements were observed in various EPIC variables post-intervention (p<0.05), including bowel subscale bother (t(29)=2.11), sexual subscale bother (t(29)=6.34), and hormonal subscale bother (t(29)=2.42). Physical health assessments also showed significant changes (p<0.05) in several areas: diastolic blood pressure, F (1, 29)=4.27; weight, F (1, 29)=4.25; combined grip strength, F (1, 29)=6.06; sit-to-stand endurance, F (1, 29)=11.93; hamstring flexibility, F (1, 29)=4.70; and shoulder flexibility, F (1, 26)=5.34.

**Conclusions:** The study’s findings indicate positive trends in improving urologic and physical health outcomes post-PC-PEP by reducing the impact of urologic symptoms and enhancing physical fitness. These results will be instrumental in refining future versions of the PC-PEP, aiming to further augment the well-being of prostate cancer survivors.

**Acknowledgements:** The authors gratefully acknowledge the participants in the study, Halifax Prostate Cancer Support Group; the Urology Department at QEII (Special thanks to Mrs. Liette Connor), Jeff Zahavi; Erika Burger; Emmi Champion; Prostate Cancer Foundation of Nova Scotia through an Establishment Grant to G.I. and Dalhousie Medical Research Foundation, through the Soillse Research Fund (G.I.), as well as by the Mach–Gaensslen Foundation of Canada (L.B.). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.
Includes extracted content from image.
MP 1.17

Eligibility to PSMA-RLT based on dual FDG/PSMA-PET: A subanalysis of the 3TMPO study

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Introduction: Eligibility criteria for PSMA-RLT are currently debated. We propose new imaging eligibility criteria based on dual-tracer FDG/PSMA-PET that do not rely on lesion size. We compared these criteria with those of the Therap and Vision (VISION) trials when applied to patients with metastatic castration-resistant prostate cancer (mCRPC) and correlated the RLT eligibility with overall survival (OS).

Methods: Ninety-eight mCRPC patients underwent FDG and PSMA PET/CT scans and then managed by best SOC. Lesions with tumor volume ≥ 1 cc, using a threshold of 1.5x liver SUVmean, were analyzed. The ratio of SUVpeak/ liver SUVmean (SUVr) was computed. Eligibility to RLT was defined as ≥ 1 PSMA+ lesion and no FDG+PSMA– lesion. RLT eligibility was defined as: 1) the protocol’s threshold of SUVr ≥ 1.5 for both tracers (3TMPOA); and 2) post-hoc, relaxed thresholds of SUVr ≥ 2.0 for FDG and of SUVr ≥ 1.0 for PSMA (3TMPOB). RLT eligibility according to Therap and Vision criteria was determined by two experts. OS was derived from Kaplan-Meier curves.

Results: Applying the 3TMPOA eligibility criteria resulted in 53% of the participants eligible to PSMA-RLT and increased to 70% with the relaxed 3TMPOB criteria. In comparison, 40% and 77% of the participants would have been eligible based on Therap and Vision criteria, respectively. After a median follow-up of 12.3 (95% CI 12.1–12.4) months, the median OS of the cohort was 10.2 (95% CI 8.5–11.8) months. For all criteria sets, the median OS of the cohort was 10.2 (95% CI 8.5–11.8) months. For all criteria sets, the median OS of RLT-eligible participants was superior to that of ineligible ones, with reductions in the risk of death (HR 0.38–0.63, p=0.0002–0.10) (Figure 1).

Conclusions: We propose two novel dual FDG/PSMA PET-based RLT eligibility criteria sets — one more selective and one more permissive — that would both allow more mCRPC patients to receive PSMA-RLT. Our pragmatic criteria sets would fill the knowledge gap regarding the benefits of PSMA-RLT in patients harboring FDG+ lesions with borderline PSMA expression.