Transcriptome profiling of NRG Oncology/RTOG 9601: Validation of a prognostic genomic classifier in salvage radiotherapy prostate cancer patients from a prospective randomized trial.

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Background: Decipher is a genomic classifier (GC) that estimates risk of prostate cancer (PCa) distant metastases (DM) post-radical prostatectomy (RP). Herein, we validate the GC within the context of a randomized phase 3 trial. **Methods:** RP specimens from patients on the NRG/RTOG 9601 phase 3 placebo-controlled randomized trial of salvage radiotherapy (sRT) +/- 2 years of bicalutamide (NCT00002874) were centrally reviewed and the highest-grade tumor underwent RNA extraction. Samples passing quality control (QC) were run on a clinical-grade whole-transcriptome assay to assign the GC score (scale 0-1). Our NCTN-CCSC approved pre-specified statistical plan (NRG-GU-TS002 CSC0075) included the primary objective of validating the ability of the GC to independently prognosticate the cumulative incidence of DM, with secondary end-points of prostate cancer-specific mortality (PCSM) and overall survival (OS). **Results:** Of patients with tissue available, 352 passed QC and were included for analysis. The final GC cohort was a representative sample of the overall cohort, with a median follow-up of 13 years. On multivariable analysis, the GC (continuous variable) was independently associated with DM (HR 1.19 [95%CI 1.06-1.35], p=0.003), PCSM (HR 1.37 [95%CI 1.18-1.61], p$<$0.001), and OS (HR 1.16 [95%CI 1.06-1.28], p=0.002) after adjusting for age, race, Gleason score, T-stage, margin status, entry PSA, and treatment arm. The estimated absolute impact of bicalutamide on 12-year OS was less in patients with lower vs higher GC scores (2.4% vs 8.9%), further demonstrated in men receiving early sRT at PSA $<$0.7 ng/mL (-2.0% vs 5.0%). **Conclusions:** This is the first validation of this GC in a prospective randomized trial cohort and demonstrates association of the GC with DM and PCSM independent of standard clinicopathologic variables. The GC may help personalize shared decision-making to weigh the absolute benefit from the addition of bicalutamide to sRT. Research Sponsor: U.S. National Institutes of Health, Pharmaceutical/Biotech Company.

Analysis of small non-coding RNAs in urinary exosomes to classify prostate cancer into low-grade (GG1) and higher-grade (GG2-5).

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Background: To develop a new predictive test for prostate cancer, based on the interrogation of small non-coding RNAs (sncRNA) isolated from urinary exosomes. We report the development and performance of the miR Sentinel PCa Test, that distinguishes patients with prostate cancer from those with no evidence of prostate cancer (NEPC) and the miR Sentinel CS Test, that distinguishes low grade from higher grade disease. **Methods:** Affymetrix miR 4.0 arrays were used to identify informative sncRNAs isolated from urinary exosomes. sncRNA from 233 subjects undergoing a prostate biopsy [89 men with benign biopsies, 88 with grade group 1 (GG1) cancer and 56 patients with grade group 2-5 (GG2-5)] were interrogated on these arrays. A custom OpenArray platform was designed to interrogate the 280 most informative sncRNAs, identified using a data-driven selection algorithm. The platform was designed to categorize patients as either no cancer or cancer using the miR Sentinel PCa Test, and subclassify the patients with cancer into GG1 or GG2-5 cancer using the miR Sentinel CS Test. The performance of the miR Sentinel PCa and CS Tests was validated in an independent cohort. **Results:** In 233 men, theSentinel PCa Test correctly classified 89/89 subjects with no cancer and 144/144 with cancer. The Sentinel CS Test correctly identified 55/56 patients with GG2-5 and 87/88 patients with GG1. Sensitivity was 98%, Specificity 98%, NPV 98% and PPV 93%. For validation, a prospective observational study of 329 subjects (NEPC = 139; GG1= 88; GG2-5 = 102) with elevated PSA correctly classified 134/139 as no cancer [Sensitivity 98% (195/199); Specificity 96% (134/139), PPV 98% and NPV 97%]. The Sentinel CS Test classified 87/88 as GG1 and 102/102 as GG2-5 [Sensitivity 100% (102/102), Specificity 99% (87/88), PPV 99%, and NPV=100%]. **Conclusions:** Initial evaluation of the miR Sentinel PCa and CS Tests demonstrated the high precision of these tests to detect prostate cancer and distinguish high grade (GG2-5) disease. Further validation is ongoing. Research Sponsor: Funded by miR Scientific LLC.

	Sensitivity	Specificity	PPV	NPV
Percentage (%)	100	99	99	100
Frequency	102/102	87/88	102/103	87/87

278 Poster Session (Board #K6), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Evaluation of Proclarix, a prostate cancer risk score, used together with magnetic resonance imaging for the diagnosis of clinically significant prostate cancer.

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Background: The use of multi-parametric magnetic resonance imaging (mpMRI) has been a significant advance in the diagnosis of prostate cancer (PCa) recommended in a number of guidelines. There are considerable resource implications in scanning all men at risk of PCa. Furthermore, a significant number of mpMRIs are reported as indeterminate, leading to unnecessary biopsies. Proclarix is a CE-marked test based on two novel biomarkers, thrombospondin 1 (THBS1) and cathepsin D (CTSD), combined with PSA and age. A software algorithm returns a risk score that can be used as an aid in the identification of clinically significant PCa (any Grade Group 2 or greater). We aimed to assess the potential of Proclarix to identify those men who could safely avoid an upfront mpMRI or those men who could avoid biopsy when the mpMRI was indeterminate. **Methods:** Proclarix was correlated retrospectively with diagnostic data from 282 men recruited in the INNOVATE study (NCT02689271). INNOVATE involved men undergoing mpMRI followed by targeted and systematic biopsies in those with a suspicious mpMRI. **Results:** Median age and PSA were 66 (IQR 59-70) and 5.4 (3.8-7.8) ng/mL. 182 (65%) men underwent biopsy and 78 (43%) had GG≥2 PCa. Application of Proclarix in all 282 men undergoing mpMRI resulted in a sensitivity for clinically significant PCa (GG≥2) of 91%, a negative predictive value (NPV) of 92% and 38% specificity. When normalized to the same sensitivity of 91%, %fPSA resulted in both lower NPV (89%) and specificity (28%) when compared to Proclarix. 144 (51%) men had an indeterminate mpMRI of whom 84 (58%) had a biopsy and 13 (15%) had GG≥2 PCa. In these men, Proclarix had an NPV of 100%, at 100% sensitivity and a specificity of 34%. When results were compared using equal sensitivity, PSA density (cut-off 0.05 ng/mL), which is frequently used to inform the need for biopsy, had 10% specificity. **Conclusions:** The use of Proclarix could potentially allow 38% of men to avoid undergoing an mpMRI. In men with an indeterminate mpMRI, Proclarix could allow one-third to safely avoid biopsies without missing any clinically significant cancer. Research Sponsor: Proteomedix.

279 **Poster Session (Board #K7), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Artificial intelligence for streamlined immunofluorescence-based biomarker discovery in prostate cancer.

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Background: Immunofluorescence (IF) performed on tissue microarrays (TMA) is used for biomarker discovery but is limited by the arduous and subjective human visual assessment with an IF microscope. We aim to implement deep learning-based artificial intelligence (AI) models to automate and speed up the analysis of numerous biomarkers and generate prediction models of recurrence and metastasis after surgery. **Methods:** A TMA was constructed consisting of 648 samples (424 tumors, 224 normal tissue) generated from prostatectomy specimens. IF staining was performed on the TMA using anti Ki-67, ERG antibodies and analyzed for differential expression using "gold standard" manual microscopy and using an AI algorithm. Analysis was done blinded to any clinicopathological data. For manual microscopy, relative mean fluorescence intensity of cancerous versus normal tissue was determined. The AI algorithm was generated using a training cohort of digitized images. To do so the Otsu method thresholding algorithm combined with mean shift clustering was employed to find cell centers, followed by a level-set algorithm, to compute cell boundaries.These predictions were then combined with pixel predictions of a fully convolutional deep model to refine the regions of overlapping epithelium, stroma, and artifact. The algorithm was then validated using a separate cohort. Results from the algorithm were then compared to the data from manual microscopy. **Results:** Ki-67 and ERG expression levels generated by the algorithm showed only a 5% variance compared to the manually generated results. The algorithm was able to pick out which tumor were positive for ERG with 100% accuracy in spite of variance from artifacts. The algorithm also had the ability to improve its accuracy after each iteration of modifications and feedback through the training cohort. **Conclusions:** The AI algorithm produced similar outcomes than manual quantification with high accuracy but with more efficiency, cost effectiveness and objectivity. We are now developing more complex algorithms that will include the differential pattern of expression of PTEN, MYC and others with the objectives of streamlining biomarker discovery. Research Sponsor: DOD (Department of Defense), Other Foundation.

280 **Poster Session (Board #K8), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Impact of MRI on outcomes in active surveillance (AS) for localized prostate cancer in a hospital registry.

Praful Ravi, Neil E. Martin, Quoc-Dien Trinh, Grace Shaw, Mark Pomerantz, Mark A. Preston, Manuel Pedregal, Mary-Ellen Taplin, Adam S. Kibel, Christopher Sweeney; Dana-Farber Cancer Institute, Boston, MA; Dana-Farber Cancer Institute/Brigham & Women's Hospital, Boston, MA; Brigham and Women's Hospital, Boston, MA; Lank Center for Genitourinary Oncology, Dana-Farber Cancer Institute, Boston, MA; Brigham & Women's Hospital, Boston, MA

Background: MRI is increasingly used in follow-up of men undergoing AS for localized prostate cancer. Large cohorts predating the MRI era have shown that the risk of disease progression or stopping an AS protocol is ~20-30% at 5 years, but the impact of MRI on outcomes in AS is unclear. **Methods:** We studied men who initiated AS at Dana-Farber Cancer Institute between 2001-2017 for Gleason 6 prostate cancer diagnosed on transrectal ultrasound-guided biopsy, and who underwent a prostate MRI as part of their AS protocol. Progression on AS was defined as finding Gleason ≥7 cancer on repeat biopsy or at radical prostatectomy. Early MRI was defined as one performed within 1 year of diagnosis. **Results:** A total of 148 men were identified from a prospective IRB-approved database. Median PSA at diagnosis was 4.8 (range 0.7-14.3), median number of positive biopsy cores was 1 (1-7), median maximal core involvement by cancer was 10% (1-65), and most men (87%) had T1c disease. Overall, 54 (36%) progressed on AS over a median follow-up of 5.6 years (95% CI 5.1-6.0), with the majority (n=44, 81%) progressing at repeat biopsy; the 5-year progression rate was 32% (25-41). There were no major differences in baseline clinicopathologic characteristics between men undergoing early (n=103, 70%) or delayed (n=45, 30%) MRI, but men who had an early MRI underwent fewer subsequent biopsies (median 2 vs. 3, p=0.010) and more targeted biopsies (47% vs. 36, p=0.212). Men who underwent early MRI had a higher rate of progression compared to those who had a delayed MRI (5-year rate 43% [33-55] vs. 12% [5-26], log-rank p=0.001). However, when immortal time bias was accounted for by considering MRI receipt as a time-dependent covariate, early MRI was not associated with progression (HR=0.74 [0.50-1.09], p=0.129). **Conclusions:** The 5-year progression rate on AS was ~30% in the MRI era, a rate similar to that reported in series that predate the adoption of MRI. A higher rate of progression was seen in men undergoing MRI within 1 year of diagnosis, but MRI timing did not influence risk of progression when accounting for the time interval before an MRI was performed. Longer follow-up is needed to determine the impact of MRI on cancer-specific survival in men undergoing AS. Research Sponsor: None.

281 **Poster Session (Board #K9), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Integrating comprehensive genomic profiling into the clinical management of prostate cancer patients: A single institution community practice experience.

Neal D. Shore, James Haberberger, Eric Allan Severson, Brian Michael Alexander, Pratheesh Sathyan, Prasanth Reddy, Shakti H. Ramkissoon; Carolina Urologic Research Center, Myrtle Beach, SC; Foundation Medicine Inc, Cambridge, MA; Foundation Medicine, Inc., Cambridge, MA; Foundationmedicine, Cambridge, MA; Foundation Medicine, Cambridge, MA

Background: Prostate cancer is a leading cause of cancer-related mortality with a 5-year survival rate of 69%. In this study, we examine the role of integrating CGP, including tissue and liquid biopsy testing, into the clinical management of prostate cancer patients. **Methods:** We analyzed 140 cases of advanced prostate carcinoma with tissue and ctDNA based Comprehensive Genomic Profiling (CGP). CGP analysis revealed genomic alterations (GAs), TMB and MSI status. Germline testing, using multiple commercially assays was also obtained. **Results:** The median age of patients tested by tissue-based and liquid-based CGP was 65 years (46 to 85 yrs) and 69 years (51 to > 89 years), respectively. CGP analysis of tissue samples revealed the most commonly altered genes to be *TP53* (34.6%), *TMPRSS2-ERG* (25.9%), *PTEN* (23.5%), *NBN* (14.8%), *MYC* (13.6%), *BRCA2* (14.3%) and *CDKN2A* (13.3%). TMB analysis determined in 77 tissue samples showed a median (mean) value of 2.61 (5.00) mutations/Mb. 3.9% cases (3/77) were found to be hypermutated. MSI status was determined in 74 cases of which 2.7% (2/74) were found to be MSI-High. Of the tissue-based samples tested, 30.9% (25/81) were derived from metastatic sites. Analysis of commonly altered genes between primary vs metastatic tissue samples revealed *TP53* mutations were significantly enriched in metastatic tumors. CGP analysis of the 59 liquid biopsy samples revealed the most commonly altered genes to be *TP53* (37.3%), *NF1* (10.2%), *ATM* (10.2%), *CHEK2* (8.5%) and *GNAS* (8.5%). Germline testing was performed as described above on a clinically indicated subset of patients, which revealed alterations in *BRCA*, *ATM*, *CHEK2*, *BRIP1* and *TP53,* among others. We are evaluating additional patient samples as part of the data set, which will be added to the final abstract presentation with a cutoff date of 12-31-2019. **Conclusions:** Genomic testing for high risk and advanced prostate cancer patients per the NCCN recommendations, with somatic testing, using tissue and liquid biopsy testing, as well as germline testing in selected cases, identifies DNA alterations which have potential clinical utility for clinical trial enrollment. Research Sponsor: None.

282 **Poster Session (Board #K10), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Pathologic outcomes of MRI invisible tumors in prostate cancer.

Sandeep Gurram, Amir H. Lebastchi, Michael Ahdoot, Alex Z. Wang, Bradford J. Wood, Baris Turkbey, Peter A. Pinto; Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Center for Interventional Oncology, National Institutes of Health, Bethesda, MD; Molecular Imaging Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD

Background: Magnetic resonance imaging (MRI) invisible tumors are a diagnostic challenge in prostate cancer due to the lack of ability to reliably monitor these lesions radiographically or pathologically. The progression and natural history of these lesions are unknown and outcomes over time are unclear. **Methods:** Men with multiparametric MRI of the prostate and MRI/Transrectal ultrasound (TRUS) fusion guided biopsy were assessed for the presence of MRI invisible tumors (MIT). An MIT is defined as cancer detected only on extended sextant biopsy and not visible on MRI. All men first underwent an MRI/TRUS fusion biopsy with tracked extended sextant biopsy which originally detected the MIT. The original biopsy needle course sampling these MITs was tracked and set as a future target using the MRI/TRUS fusion platform. Men subsequently underwent a combined MRI/TRUS fusion biopsy, systematic extended sextant biopsy, and a Targeted Tracked biopsy of the MIT (TT-MIT) that was recorded and tracked from the original biopsy. We describe the outcomes of tracking these MITs and compare the ability to monitor them with TT-MIT biopsy as opposed to systematic extended sextant biopsy. **Results:** 105 MITs were identified, 84 (80%) of which were originally Gleason 6 tumors. The median time between biopsies was 16.6 months. The overall cancer detection rate with TT-MIT was 77.4% compared to 59.7% using systematic extended sextant biopsy. Using TT-MIT, these invisible tumors showed higher Gleason scores in 16 (15.2%) tumors. When TT-MIT was compared to the systematic extended sextant biopsy sampling the corresponding location, it showed increased Gleason scores in 30 (28.6%) MITs while 58 (55.2%) showed concordant pathology and 17 (16.2%) showed less aggressive pathology. **Conclusions:** The ability to follow MRI invisible tumors suggests that these tumors are more effectively tracked using TT-MIT biopsy technique. These MITs change over time and 15% of them will upgrade to higher Gleason scores. Tracking these tumors with TT-MIT biopsy increases cancer detection rate compared to standard sextant biopsy and more accurately samples these MITs, unveiling a more aggressive pathology. Research Sponsor: U.S. National Institutes of Health.

283 **Poster Session (Board #K11), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Does size matter? Lesion size as an indicator of number of cores needed to detect clinically significant prostate cancer.

Amir H. Lebastchi, Luke P. O'Connor, Alex Z. Wang, Nitin Yerram, Sandeep Gurram, Graham Hale, Jonathon B. Bloom, Samuel A. Gold, Kareem N. Rayn, Sherif Mehralivand, Bradford J. Wood, Joanna H. Shih, Baris Turkbey, Peter A. Pinto; Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Molecular Imaging Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Center for Interventional Oncology, National Institutes of Health, Bethesda, MD; Division of Cancer Treatment and Diagnosis, National Cancer Institute, Bethesda, MD

Background: MRI/US fusion guided prostate biopsy (FBx) has been shown to detect clinically significant prostate cancer (csCaP) at higher rates and with fewer cores than standard prostate biopsy. Size plays an important role in assigning a suspicion level (PI-RADS) to lesions identified on MRI. However, tumor characteristics may pose challenges to accurately characterizing the lesion despite the size. This study sought to determine if there are size cutoffs at which a lesion may be accurately characterized as clinically significant cancer with a single biopsy core. **Methods:** A retrospective analysis of a prospectively maintained database of all patients undergoing FBx at an academic referral center between May 2014 and January 2018 was conducted. At least two FBx cores were taken from each lesion identified on mpMRI. GEE-based univariate logistic regression model with exchangeable correlation was used determine if size was a significant predictor of positive and negative agreement. Predictability of size as a significant continuous predictor was quantified by AUC. Size thresholds at which multiple cores per lesion are needed to avoid missing $>$ 2% of csCaP were calculated, allowing for a 25% discordance rate. **Results:** An analysis of a total of 1141 FBx of 2200 lesions was performed during the study time interval. Size was a significant predictor of both positive (OR = 2.43, 1.83-3.23, $p < 0.01$) and negative (OR = 0.58, 0.44-0.76, $p < 0.01$) agreement of csCaP. AUC% for positive and negative agreement was 65.8 and 57.6, respectively. Size thresholds of 0.65 and 1.70 cm limited CS cancers missed by skipping a second targeted biopsy core to 2% while allowing for a 25% discordance. **Conclusions:** These data indicate that clinically significant prostate cancer in lesions less than 0.65 cm and greater than 1.70 cm may be characterized with a single targeted biopsy core, sparing 33.5% of lesions (21% patients) a double core targeted biopsy. Research Sponsor: None.

284 Poster Session (Board #K12), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

TMPRSS2: ERG expression in prostate cancer—Imaging and clinicopathological correlations.

Vittorio Fasulo, Massimo Lazzeri, Marinella Corbetta, Marco Paciotti, Davide Maffei, Giulia Soldà, Luigi Domanico, Nicola Frego, Federica Regis, Pietro Diana, Rosanna Asselta, Nicolo' Buffi, Paolo Casale, Alberto Saita, Chiara Chiereghin, Giovanni Lughezzani, Monica Zuradelli, Rodolfo Hurle, Stefano Duga, Giorgio Ferruccio Guazzoni; IRCCS Humanitas Clinical and Research Hospital, Rozzano, Italy; IRCCS Humanitas Clinical and Research Center, Rozzano, Italy; Humanitas Cancer Center, IRCCS, Rozzano, Italy

Background: The TMPRSS2:ERG gene fusion (T:E) is found in up to 70% of prostate cancers (PCa) and results in androgen dependent overexpression of ERG, promoting tumor growth. The early identification of T:E may be helpful even in low-risk PCa. Although T:E can be non-invasively detected in urine, its correlation with new imaging tools (MRI and high-frequency ultrasound) and clinical outcome remains vague.This study investigates T:E expression in patients scheduled for random/software-assisted MRI or micro-ultrasound (29Mhz) fusion biopsy. **Methods:** This is a prospective cohort study in patients with suspected PCa enrolled between 2016 and 2019, approved by local authorities with Prot. N. 336/19, 14/05/2019. Patients underwent systematic US-guided biopsy, plus targeted biopsy if they had ^{3}1 suspicious lesion (PI-RADS V.2 $>$2) at mpMRI or PRIMUS $>$2 at MICRO-US. For each patient, 1 prostatic core from the highest PI-RADS or PRIMUS lesion was collected for T:E analysis (a core from the right lobe in negative patients). Histological analyses were performed by experienced genitourinary pathologists. RNA was extracted from a dedicated fresh biopsy and RT-PCR was performed with different primer couples to detect the most frequent T:E fusions. All amplified products were checked by sequencing. **Results:** The cohort consists of 92 patients (median PSA 7.13 ng/ml, IQR 5.25-11.04 - average age 65ys), 81 with a diagnosis of PCa after biopsy. mpMRI was performed on 63 (68.5%) patients and was positive in 58 (92%), who underwent fusion biopsy. T:E fusion transcripts were detected in 23.5% of individuals with a diagnosis of PCa. Among patients positive for T:E, those analyzed by MRI were 100% positive (73% PI-RADS $\geq$4), those analyzed by MICRO-US were 83% positive. Sensitivity of the T:E assay for any PCa was 23.5%, specificity 100%, with negative and positive predicting values of 15% and 100%. There was no correlation between T:E and family history, PSA, PIRADS, PRI-MUS and Gleason score. **Conclusions:** Our finding showed a 100% of specificity making T:E an attractive tool for early cancer detection. In the future, identification of T:E in semen could represent a screening test for clinical stratification of patients with suspected PCa. Research Sponsor: None.

285 **Poster Session (Board #K13), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A phase IIa randomized placebo-controlled trial of pomegranate fruit extract/POMx in subjects with clinically localized prostate cancer undergoing active surveillance.

David Frazier Jarrard, Miko Filon, Wei Huang, KyungMann Kim, Tom Havighurst, Badrinath R. Konety, Daniel Saltzstein, Hasan Mukhtar, Margaret House, Chen S. Suen, Howard L. Parnes, Howard Harry Bailey; University of Wisconsin Hosp and Clinics, Madison, WI; UW-Madison, Madison, WI; University of Wisconsin Madison, Madison, WI; University of Wisconsin, Madison, WI; University of Minnesota, Minneapolis, MN; Urology San Antonio, San Antonio, TX; NIH, Bethesda, MD; NCI, Bethesda, MD; National Cancer Institute at the National Institutes of Health, Bethesda, MD

Background: Due to its high prevalence and often indolent natural history, prostate cancer(PC) active surveillance(AS) is an ideal setting for chemoprevention. Studies assessing pomegranate and its extracts have shown promising anti-proliferative and pro-apoptotic effects in cell lines and animal models and a single-arm clinical trial of pomegranate fruit extract(PFE) reported an increase in PSA doubling time(PSADT) during AS. The primary objective of this trial was to assess the effect of PFE supplementation on plasma levels of Insulin-like Growth Factor-1(IGF-1). Secondary objectives addressed PSA doubling time(PSADT), tumor volume on end-of-study(EOS) biopsy and plasma and prostate tissue biomarkers. **Methods:** Men with organ-confined favorable-risk PC on AS were randomly assigned to receive PFE 1,000 mg(n=15) or placebo(n=15) once daily for twelve months. Prostate biopsies were performed at study entry and upon completion of the one-year intervention. Tissue biomarkers were assessed by immunohistochemistry(IHC) with automated quantitation. **Results:** PFE was well-tolerated with no significant toxicities. One patient withdrew before study initiation and 29 completed the one-year intervention. No differences in plasma IGF-1 levels(p=0.5), PSADT, or tissue biomarkers of apoptosis or proliferation were observed. A significant increase in urolithin A(a urinary metabolite of pomegranate) was observed in the PFE arm. IHC analyses of both tumor (Table) and normal-appearing tissue adjacent to tumor showed reductions from baseline in IGF-1, 8-OHdG(DNA damage marker), and androgen receptor expression associated with PFE treatment. A trend towards a reduction in the maximum percent of biopsy core tumor involvement was observed(p=0.06) in PFE. **Conclusions:** PFE administration for 12-months was not associated with a decrease in plasma IGF-1 levels nor an increase in PSADT. However, exploratory analyses suggest that PFE may contain bioactive compounds capable of altering biomarkers in PC and normal-appearing adjacent tissue providing a rationale for further investigation of PFE in the active surveillance population. Research Sponsor: None.

286 **Poster Session (Board #K14), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Detection of significant prostate cancer through magnetic resonance imaging targeted biopsy of PI-RADS3 lesions in African American patients based on prostate specific antigen density threshold of 0.15 ng/ml^2: Analysis of patient population from the Vattikuti Urology Institute.

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Background: A prostate specific antigen density (PSAD) threshold of 0.15 ng/ml^2 have been suggested for significant cancer detection in PI-RADS 3 lesions to avoid unnecessary magnetic resonance imaging targeted biopsy (MRI-TB) of these lesions. However, the performance of this threshold in African American (AA) patients is not well characterized. **Methods:** We analyzed our institutional data base of MRI-TB to identify the rate of significant prostate cancer (Pca) detection in PI-RADS3 lesions in AA patients stratified by PSAD threshold of $<$ 0.15 vs. $\geq$0.15 ng/ml^2 and lesion size of $<$1 cm vs $\geq$ 1 cm. Significant prostate cancer was defined as Gleason grade group 2 or higher on MRI-TB of the PI-RADS 3 lesion. **Results:** Of 768 patients included in the database, 211 (27.5%) patients identified themselves as AAs. Mean age of AA patients was 63 years and mean PSAD was 0.21. Sixty nine (32.7%) AA patients were found to have PI-RADS 3 lesions. Mean PSAD of AA patients with PI-RADS 3 lesions was 0.21 ng/ml^2 as well. Fifty percent of AA patients with PI-RADS 3 lesions had PSAD $\geq$0.15 ng/ml^2. Significant Pca detection rate for AA patients with PI-RADS 3 lesions was 9% for PSAD of $\geq$ 0.15 vs. 0.03% percent for AA patients with PSAD $<$ 0.15 ng/ml^2 (OR 7.056, CI 1.017-167.9, P=0.04). Stratification by lesion size ($<$ 1 cm vs. $>$ 1 cm) resulted in missing 0% percentage of significant Pca when only AA patients with PSAD $\geq$ 0.15 ng/ml2 and lesion size $\geq$ 1 cm received MRI-TB. **Conclusions:** We report on the performance of a reported PSAD density threshold in detecting significant Pca in one of the largest series of AA patients receiving MRI-TB of the prostate. Our results have direct clinical implications when counseling AA patients with PI-RADS 3 lesion on whether they should undergo MRI-TB of such lesions. Research Sponsor: None.

287 **Poster Session (Board #K15), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Urine exosome gene expression assay net benefit analysis in a large pooled cohort.

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Background: Over-diagnosis of indolent prostate cancer (PCa), supports the need for non-invasive tools that can differentiate low-grade ($\leq$ Gleason score 6, GS 6) from high-grade ($\geq$ GS 7). We examined the clinical benefit of ExoDx™ Prostate (IntelliScore) (EPI) results in a pooled cohort over a range of probabilities using net benefit analysis. **Methods:** A pooled dataset of two prior validation cohorts and additional cases from a large group practice provided a large data set (N=1,212) for net benefit analysis. The pooled population consisted of men $>$ 50 years, scheduled for initial biopsy and with a PSA measurement. Urine specimens were collected at enrollment using a provided urine collection device and the EPI tests were run at a CLIA-certified central laboratory at Exosome Diagnostics, Waltham, MA. The clinical decision value of the urine exosome gene expression assay (EPI) was assessed using net benefit analysis and compared EPI results with standard of care information across a range of probabilities for which a patient might decide on a prostate biopsy. The net benefit is determined by adding the true positive results and subtracting the false negatives across different biopsy probability thresholds. **Results:** The ExoDx IntelliScore or EPI assay (green) demonstrated superior clinical benefit when compared to the Prostate Cancer Prevention Trial (PCPT) prostate cancer risk calculator or PSA. **Conclusions:** In this new analysis of a large pooled cohort, the EPI exosome gene expression assay had the highest clinical net benefit across the 10% - 50% decision threshold compared to decision support methods currently used in the clinic. Research Sponsor: Exosome Diagnostics.

288 **Poster Session (Board #K16), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Detection of clinically significant prostate cancer after negative fusion and systematic biopsy.

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Background: MRI/Ultrasound fusion biopsy of the prostate has enhanced the detection of clinically significant prostate cancer (csPCa). Detection of csPCa is greatest when fusion and systematic biopsies are combined. However, the finding of a negative fusion and negative systematic biopsy in patients with suspicious lesion on imaging raises the question of either falsely positive imaging or a false negative biopsy. **Methods:** We retrospectively reviewed our database of patients undergoing MRI/transrectal US-guided fusion biopsy. All images were graded according to the Prostate Imaging Reporting and Data System version (PIRADS) 2.0. Patients underwent targeted biopsy followed by systematic 12-core double sextant biopsy within the same session. csPCa was defined as Grade Group (GG) $\geq$2 PCa. Patients with no prostate cancer (PCa) found on biopsies were followed. MRI studies with PIRADS v2 score $\leq$ 2 were considered to have no MRI evidence of PCa. **Results:** A total of 400 patients had at least one PIRADS $\geq$3 lesion and underwent fusion/systematic biopsy. Of these, 113 (28.3%) patients had no evidence of PCa on either fusion or systematic biopsy. Median follow-up was 32.5 months. 44 (39%) patients underwent repeat MRI and of these, 24 (54%) had no evidence of PCa on repeat MRI. PIRADS lesion disappearance was associated with lower PSA Density (PSAd) (0.12 vs 0.20; P = 0.0319) and decreased progression to repeat biopsy (8.33% vs 95%; $P < 0.0001$). Patients who had a repeat biopsy had a greater PSAd (0.21 vs 0.12; P = 0.0054). Of 113 patients with negative initial biopsy, 23 (20.4 %) underwent repeat biopsy: 16 (14.2 %) had PCa and 11 (9.7%) had csPCa. Thus, 48% of patients who underwent repeat biopsy had csPCa. Among patients with a PCa on repeat biopsy, cancer was sampled by MRI targeted cores in 80% of patients. **Conclusions:** Despite a negative initial fusion/systematic biopsy, at least 10% of patients were subsequently diagnosed with clinically significant PCa. The combination of elevated PSAd and the persistence of a suspicious lesion on repeat MRI appears selective for previously missed PCa. However, after negative fusion biopsy, repeat MRI yields a high rate of PIRADS lesion disappearance in patients with low PSAd. Research Sponsor: None.

289 **Poster Session (Board #K17), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Advancing age and the risk of adverse pathology at radical prostatectomy in men with biopsy Gleason score 6 prostate cancer.

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Background: We evaluated the impact of age > 65 years versus younger on the odds of finding adverse pathologic features (pT3/T4 and/or R1 and/or Gleason score 8, 9, 10) at radical prostatectomy (RP) among men with biopsy Gleason score 6 prostate cancer (PC). **Methods:** The study cohort comprised 3191 men with biopsy Gleason score 6 PC treated with a RP between February 28, 1992 and February 15, 2016 at the Martini-Klinik Prostate Cancer Center. Multivariable logistic regression was used to evaluate the impact of age > 65 years versus younger on the adjusted odds ratio (AOR) of finding adverse pathology at RP adjusting for pre-RP prostate specific antigen (PSA), clinical tumor category, year of diagnosis, percent positive biopsies (PPB), and PSA density (PSAd). **Results:** Men age > 65 years as compared to younger had significantly lower median PPB (16.67% vs 20.0%; p = 0.01) and PSAd (0.13 ng/mL vs 0.15 ng/mL; p < 0.0001). Yet, while both increasing PPB (AOR 1.018, 95% CI 1.013, 1.023; p- < 0.0001) and PSAd (AOR 4.28, 95% CI 1.66, 11.01; p = 0.003) were significantly associated with an increased odds of finding adverse pathology at RP, men age > 65 years versus younger had a higher odds of adverse pathology at RP (AOR 1.28, 95% CI 1.002, 1.62; p = 0.048). **Conclusions:** Despite a more favorable median PPB and PSAd, men with biopsy Gleason score 6 PC and who are age > 65 years compared to younger men are at higher risk for having adverse pathology at RP and may benefit from a multiparametric MRI and targeted biopsy before proceeding with active surveillance. If higher grade/stage disease is discovered and treatment indicated then this information could guide both the use and duration of supplemental androgen deprivation therapy in men considering radiation therapy. Research Sponsor: None.

290 Poster Session (Board #K18), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Risk factors which predict biopsy upgrading over time in active surveillance for prostate cancer.

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Background: Active surveillance (AS) is recognized as the preferred treatment for low risk prostate cancer (PCa). No validated clinical tools currently exist to standardize the frequency of biopsies. We aimed to determine predictors of biopsy upgrading in a contemporary cohort of patients on AS. **Methods:** Men enrolled on AS at UCSF between 2000-2016 were included. The genomic tests used were Oncotype DX, Decipher and Prolaris. Biopsy upgrade was defined as ISUP grade group $\geq$ 2 on subsequent biopsy. PSA kinetics was calculated using a linear mixed-effects model for log of PSA, adjusted for clinical characteristics. Multivariable Cox proportional hazards regression models were utilized to identify factors associated with risk of upgrade on follow-up at first surveillance biopsy and at 3, 5 and 10 years. **Results:** 1,303 men were included. Upgrade-free survival at 3, 5 and 10 years was 73%, 53% and 27% respectively. Median time between diagnostic biopsy and first surveillance biopsy was 13 months (IQR 9-16) with the risk of upgrade at first surveillance biopsy associated with PSA density (hazard ratio [HR] 2.761, 95% confidence interval [CI] 1.895-4.023), and "high" risk genomic score (HR 1.867, 95% CI 1.025-3.401) on multivariable analysis after adjustments. Independent variables significantly associated with risk of upgrade at first surveillance biopsy and at 3, 5 and 10 years on multivariable analysis after adjustments are shown. **Conclusions:** Our findings suggest that genomic scores and PSA density are risk factors for biopsy upgrading within 3 years of starting AS, however PSA kinetics is associated with risk of upgrade at 5 and 10 years. When used in tandem, genomic scores may identify a subset eligible for AS who could potentially adopt a less intensive surveillance regimen. Research Sponsor: None.

	Upgrade at first surveillance biopsy HR (95% CI)	Upgrade at 3 Years HR (95% CI)	Upgrade at 5 Years HR (95% CI)	Upgrade at 10 Years HR (95% CI)
% cores positive	1.18 (1.04-1.36)	1.13 (1.02-1.26)	1.17 (1.01-1.35)	NS
PSA density (log)	2.76 (1.90-4.02	2.03 (1.46-2.82)	2.29 (1.48-3.53)	NS
Gleason 3+4 vs 3+3	0.45 (0.24-0.87)	NS	NS	NS
"High" risk genomic score	1.87 (1.03-3.40)	2.10 (1.22-3.61)	NS	NS
PSA kinetics	NS	1.14 (1.03-1.27)	1.40 (1.15-1.70)	1.63 (1.04-2.55)

291 **Poster Session (Board #K19), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

GLUT1 expression in high-risk prostate cancer: Correlation with 18F-FDG-PET/CT and clinical outcome.

Frederic Pouliot, Salma Meizou, Cassandra Ringuette Goulet, Helene Hovington, Veronique Lefebvre, Etienne Lavallée, Michelle Bergeron, Hervé Brisson, Audrey Champagne, Bertrand Neveu, Didier Lacombe, Jean-Mathieu Beauregard, François-Alexandre Buteau, Julie Riopel; Cancer Research Center, Centre Hospitalier Universitaire (CHU) de Québec-Université Laval, Quebec City, QC, Canada; Laval University, Quebec City, QC, Canada; Centre Hospitalier Universitaire (CHU) de Québec-Université Laval, Quebec City, QC, Canada

Background: Tumour FDG-uptake is of prognostic value in high-risk and metastatic prostate cancer (PCa). The aim of this study is to investigate the underlying glucose metabolism mechanisms of 18F-FDG-uptake on PET/CT imaging in PCa. **Methods:** Retrospective analysis was conducted for 94 patients diagnosed with a Gleason sum ≥8 at biopsy who underwent 18F-FDG-PET/CT imaging before radical prostatectomy. GLUT1, GLUT12 and HK2 expression were blindly scored after immunohistochemistry on radical prostatectomy specimens by 3 pathologists. 18F-FDG-uptake in primary lesion was measured by a blinded reader using maximum standardized uptake value (SUVmax). Correlations between GLUT1, GLUT12 and HK2 and SUVmax were assessed using Spearman's rank correlation test. Survival probabilities were based on the Kaplan-Meier method. **Results:** With a median follow-up of 4.5 years, 56% (n=53) of patients had biochemical recurrence, 7% (n=7) progressed to castration-resistant PCa (CRPC) disease, 13% (n=12) developed metastasis and 6% (n=6) died. Correlation was found between GLUT1 expression and SUVmax level (r=0.2512, p=0.0182). In addition, SUVmax was significantly higher in tumours with high GLUT1 expression (n=17, 5.74±1.67) than tumours with low GLUT1 expression (n=71, 2.68±0.31, P=0.0037). Also, contrary to GLUT12 and HEX2 expression, a significant association was found between GLUT-1 expression levels and SUVmax index (p=0.004), lymph node status (p=0.046), volume of cancer (P=0.013), CRPC-free survival (p=0.02) and metastasis-free survival (p=0.04). **Conclusions:** GLUT1 expression in PCa tumours correlates with 18F-FDG-uptake and poor prognostic factors. These results suggest that this transporter is involved in the molecular mechanism of 18F-FDG-uptake in high-risk PCa and raise interest in targeting metabolic dependencies of PCa cells as a selective anticancer strategy. Research Sponsor: None.

292 Poster Session (Board #K20), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Impact of 68Ga-PSMA-11 PET on the management of biochemically recurrent prostate cancer in a prospective single-arm clinical trial.

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Background: Prostate-specific membrane antigen ligand positron emission tomography (PSMA PET) induced management changes in up to every second patient in smaller clinical trials. We aim to determine the impact of ^{68}Ga-PSMA-11 PET/CT on management of biochemically recurrent prostate cancer in a large prospective cohort. **Methods:** We report management changes following PSMA PET, a secondary endpoint of a prospective multicenter trial in men with prostate cancer biochemical recurrence (NCT02940262 and NCT03353740). Pre-PET, Post-PET and Post-Treatment Questionnaires were sent to referring physicians recording working clinical summaries, intended and implemented therapeutic and diagnostic management. **Results:** Intended management change occurred in 260/382 (68%) patients. Intended change was considered major in 176/382 (46%) patients. Management pathway aligned with PET findings, i.e. change towards local/focal therapy for locoregional disease (54/126 patients, 44%) and towards systemic therapy or combination approaches for metastatic disease (106/153 patients, 69%). Intended management was implemented in 160/206 (78%) patients. Perceived site of disease was unknown in 259/382 (68%) patients before and 111/382 (29%) patients after PSMA PET. A total of 150 intended diagnostic tests, mostly CT (n=43, 29%) and bone Scans/NaF-PET (n=52, 35%), were prevented by PSMA PET. A total of 73 tests, mostly biopsies (n=44, 60%) requested by the study protocol, were triggered. **Conclusions:** Disease localization by PSMA PET translated into management changes in more than half of patients with biochemical recurrence of prostate cancer. More than twice as many diagnostic tests were prevented than triggered following PET. Clinical trial information: NCT02940262 and NCT03353740. Research Sponsor: Patients, UCLA and UCSF Department funds.

293 Poster Session (Board #K21), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Association of PI-RADS categories and PSA density with active surveillance progression in patients with prostate cancer.

Alex Z. Wang, Luke P. O'Connor, Nitin Yerram, Johnathan Zeng, Sherif Mehralivand, Stephanie Harmon, Sandeep Gurram, Heather Chalfin, Siobhan Telfer, Amir H. Lebastchi, Michael Ahdoot, Patrick H. Gomella, Maria J. Merino, Baris Turkbey, Bradford J. Wood, Peter L. Choyke, Peter A. Pinto; Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; National Cancer Institute, National Institutes of Health, Bethesda, MD; Molecular Imaging Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Urologic Oncology Branch, National Cancer Institute, National Institutes of Health (NIH), Bethesda, MD; Laboratory of Pathology, National Cancer Institute at the National Institutes of Health, Bethesda, MD; National Institutes of Health, Bethesda, MD

Background: Active surveillance (AS) is now considered a well-accepted alternative for low-favorable intermediate risk prostate cancer over definitive therapy. Few studies have incorporated the use of multi-parametric MRI (mpMRI) into the treatment paradigm. In this study we investigate imaging findings that are predictive of a patient dropping off AS. **Methods:** Our institutional database was queried for all patients who met criteria for active surveillance from 11/2003 to 5/2017. Criteria for inclusion included $\geq$ 2 mpMRIs, $\geq$ 2 prostate biopsies, and a diagnosis of Gleason Grade group (GG) 1 or higher. Patients were excluded if they received any other therapy for the treatment of their prostate cancer such as radiation, chemotherapy, focal therapy, or immunologic therapy. Patient demographics, mpMRI, biopsy and most recent follow-up data were recorded. Factors, including PSA density (PSAD), PSA, lesion size, and PI-RADS category, associated with AS progression were evaluated in Cox Proportional Hazards Model. **Results:** An analysis of a total of 212 patients were performed during the study time interval. 88 patients were dropped from AS during this time and of those patients the median amount of time before removal was 4.70 years (range, 0.7-10.5). On univariable analysis, PI-RADS category (HR, 1.302 for every increase in 1 unit of the PI-RADS category; 95% CI, 1.046-1.62, p = 0.01) and PSAD (HR, 4.98 for every increase in 0.001 ng/mL/cc; 95% CI, 2.127-11.66; p $<$ 0.001) were found to be associated with being removed from AS. On multivariable analysis, both PI-RADS score (HR, 1.281 for every increase in 1 unit of the PI-RADS category; 95% CI, 1.025-1.6; p = 0.003) and PSAD (HR, 4.188 for every increase in 0.001 ng/mL/cc; 95% CI, 1.640-10.7; p $<$ 0.001) remained associated with being removed from AS. **Conclusions:** PI-RADS categories and PSAD predict the risk of a patient to drop off active surveillance. AS. Patients with these criteria should be considered high risk in any current AS protocol. Research Sponsor: None.

	Univariate Hazard Ratio	p-value	Multivariate Hazard Ratio	p-value
PSAD	4.980	0.001	4.188	$<$ 0.001
PSA	1.008	0.3	NA	NA
PI-RADS Score	1.302	0.01	1.281	0.003
Lesion Size	0.9959	0.7	NA	NA

294 Poster Session (Board #K22), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Deep learning-based approach for automated assessment of PTEN status.

Tamara Jamaspishvili, Stephanie Harmon, Palak Patel, Thomas Sanford, Isabelle Caven, Rachael Iseman, Sherif Mehralivand, Peter L. Choyke, David Monty Berman, Baris Turkbey; Division of Cancer Biology & Genetics, Cancer Research Institute, Queen's University, Kingston, ON, Canada; Molecular Imaging Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Department of Urology, Upstate Medical University, Syracuse, NY; Division of Cancer Biology & Genetics, Cancer Research Institute, Queen's University, Kingston, ON, Canada

Background: PTEN loss is associated with adverse outcomes in prostate cancer and has the potential to be clinically implemented as a prognostic biomarker. Deep learning algorithms applied to digital pathology can provide automated and objective assessment of biomarkers. The objective of this work was to develop an artificial intelligence (AI) system for automated detection and localization of PTEN loss in prostate cancer samples. **Methods:** Immunohistochemistry (IHC) was used to measure PTEN protein levels on prostate tissue microarrays (TMA) from two institutions (in-house n=272 and external n=125 patients). TMA cores were visually scored for PTEN loss by pathologists and, if present, spatially annotated. In-house cohort (N=1239 cores) were divided into 70/20/10 training/validation/testing sets. Two algorithms were developed: a) Class I=core-based, to label each core for biomarker status and b) Class II=pixel-based, to spatially distinguish areas of PTEN loss within each core. ResNet101 architecture was used to train a multi-resolution ensemble of classifiers at 5x, 10x, and 20x for Class I task and a single classifier at simulated 40x for Class II segmentation. **Results:** For Class I algorithm, accuracy of PTEN status was 88.3% and 93.4% in validation and testing cohorts, respectively (Table). AI-based probability of PTEN loss was higher in cores with complete loss vs partial loss. Accuracy was improved to 90.7% in validation and 93.5% in test cohorts using the Class II region-based algorithm, with median dice scores 0.833 and 0.831, respectively. Direct application to external set demonstrated a high false positive rate. Loading trained model and conservatively re-training ("fine-tuning") on 48/320 external cohort cores improved accuracy to 93.4%. **Conclusions:** Results demonstrate feasibility and robustness for fully automated detection and localization of PTEN loss in prostate cancer tissue samples and possibility for time/cost-effectiveness of sample processing/scoring in research and clinical laboratories. Research Sponsor: U.S. National Institutes of Health, Other Foundation, Other Government Agency, Funded by the NCI Contract No. HHSN261200800001E.

Class I core-based performance.

Cohort	Sensitivity	Specificity	Accuracy
Validation	97.2%	86.8%	88.3%
Test	100.0%	91.1%	92.7%
External (N=320)	100.0%	28.9%	38.4%
External fine-tune (test N=272)	89.2%	94.0%	93.4%

295 **Poster Session (Board #L1), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Characterization of PSMA and 18F-fluciclovine transporter gene expression in localized prostate cancer.

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Background: While ^{18}F-fluciclovine PET/CT is approved in the US and recommended by the NCCN, prostate-specific membrane antigen (PSMA) PET/CT is more common in Europe/Australia and recommended by the EAU. Less is known about the biology of lesions detected by either modality. ^{18}F-fluciclovine PET relies on radiotracer uptake by amino acid transporters LAT1-4 and ASCT1-2. PSMA PET is dependent on surface expression of PSMA. We compared relative expression of PSMA and fluciclovine transporter genes in radical prostatectomy (RP) samples to determine their distribution across subtypes and correlation with outcomes. **Methods:** Gene expression data of 19,102 RP samples were analyzed using the Affymetrix Human Exon 1.0 ST microarray. 1,135 patients had long term follow up. Associations between expression of PSMA and fluciclovine transporter genes (LAT1-4 and ASCT1-2) and pathologic variables, molecular subtypes, and clinical outcomes were conducted. **Results:** All fluciclovine transporter genes (LAT 1-4, ASCT1-2) were expressed at lower levels than PSMA ($p < 0.0001$). PSMA expression was positively correlated with genomic risk score and pathologic Gleason score ($p<0.0001$), but LAT2-3 and ASCT2 were inversely correlated with genomic risk in primary tumors ($p<0.0001$) and less expressed in GS 9-10 tumors ($p<0.0001$). PSMA expression was associated with worse metastasis-free survival (MFS) (HR 1.45, p=0.001) and lymph node involvement (HR 2.14, $p<0.0001$). Expression of LAT2, LAT3, ASCT2 expression was associated with better MFS (HR 0.85, 0.63, 0.74, $p<0.0001$-0.04). After multivariable adjustment, PSMA expression remained independently prognostic of poorer MFS (HR 1.3, p=0.028). Luminal B subtype was notable for PSMA overexpression; Luminal A was enriched in ASCT2 and LAT2 ($p<0.0001$). PSMA expression did not correlate with ERG fusion prostate cancers, but LAT2, ASCT1, and ASCT2 were overexpressed in ERG fusion negative tumors ($p<0.0001$). **Conclusions:** PSMA expression is associated with more aggressive disease and poorer clinical outcomes than fluciclovine transporter genes in localized prostate cancer. Molecular subtypes of prostate cancer vary in PSMA and fluciclovine transporter gene expression. Research Sponsor: U.S. National Institutes of Health, Other Foundation.

296 **Poster Session (Board #L2), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Comparison of micro-ultrasound and multiparametric MRI imaging for prostate cancer: A multicenter prospective analysis.

Laurence Klotz, Giovanni Lughezzani, Andrrea Sanchez, Frederic Staerman, Hannes Cash, Richard Gaston, Rafael Sanchez-Salas, Eric A. Klein, Gregg Eure; Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; IRCCS Humanitas Clinical and Research Center, Rozzano, Italy; Urología Clínica, Clínica IMQ Zorrotzaurre, Madrid, Spain; Department of Urology, Les Bleuets Clinic, Reims, France; Department of Urology, Charité Universitätsmedizin Berlin, Berlin, Germany, Berlin, Germany; Clinique Saint-Augustin, Bordeaux, France; Department of Urology-L'Institut Mutualiste Montsouris, Paris, France; Cleveland Clinic Foundation, Cleveland, OH; Urology of Virginia, Virginia Beach, VA

Background: This study aims to compare the sensitivity, specificity, NPV and PPV of mpMRI with the novel high-resolution micro-ultrasound imaging modality. This approach offers the benefits of simplicity, a single intervention for imaging and biopsy, leveraging the low cost of ultrasound. Micro-ultrasound may be used to image suspicious lesions and target biopsies in real-time with or without additional MRI-based targets. **Methods:** Data from 9 sites was aggregated, totaling 866 subjects presenting for ExactVu micro-ultrasound guided biopsy with available mpMRI studies. Samples in all subjects were taken from mpMRI targets and micro-ultrasound targets, with up to 12 systematic samples filled in. Various strategies were used for mpMRI target sampling including cognitive fusion with micro-ultrasound, separate software-fusion systems, and software-fusion using the micro-ultrasound FusionVu system. Clinically significant cancer was considered any Gleason Sum $>$ 6 and targeted samples were taken for PI-RADS $>$ 2 or PRI-MUS[1] $>$ 2 lesions. **Results:** Overall, 39% of all biopsy cases were positive for clinically significant PCa. mpMRI demonstrated 89% sensitivity and NPV of 77%. Compared to mpMRI, micro-ultrasound sensitivity (95%) and NPV (87%) were higher. Micro-ultrasound was less specific (21% vs 23% for mpMRI) with similar PPV (44% vs 43%). The aggregate effect demonstrates higher sensitivity for csPCa with micro-ultrasound compared to mpMRI ($p<0.01$). **Conclusions:** Micro-ultrasound is an attractive option for screening and targeted biopsy. Sensitivity and NPV appear superior to MRI, but specificity is mildly reduced. Further larger-scale studies are required for validation of these findings. References: Ghai, S. et al., "Assessing Cancer Risk in Novel 29 MHz Micro-Ultrasound Images of the Prostate", Journal of Urology, 2016 Aug;196(2):562-9. Clinical trial information: NCT03938376. Research Sponsor: Exact Imaging.

297 Poster Session (Board #L3), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Disparities in receipt of molecular imaging in biochemical recurrent prostate cancer.

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Background: Molecular imaging with novel radiotracers is changing treatment landscape in prostate cancer (PCa). Currently, standard of care includes both conventional and molecular imaging, leaving uncertainty in prescription decision. This study evaluated the determinants of and disparities in utilization of molecular imaging for biochemical recurrent (BR) PCa. **Methods:** This is an observational, single institution, cohort study within the University of California, San Francisco (UCSF). Data were obtained on all men with BR PCa seen at UCSF from June 2018 to May 2019, regardless of histologic subtype. Multivariate logistic regression models were employed to analyze the primary outcome: receipt of molecular imaging (e.g. Fluciclovine PET, Prostate Specific Membrane Antigen PET) as part of diagnostic work-up for BR PCa. Multivariate linear regression models were used to analyze the secondary outcome: overall healthcare cost (hereafter cost) within a one-year time-frame. **Results:** The study sample included 245 patients; 88% non-Hispanic White (White), 2 % non-Hispanic Black (Black), 9% Asian/Pacific Islander (Asian), and 10% Other. The majority were 55 years or older (66%) and privately insured (73%). Analysis indicated that a one unit reduction in PSA is associated with 1.4 times higher likelihood of receiving molecular imaging ($p<0.01$). Analysis found that privately insured patients experienced approximately $500,000 more in cost ($p<0.01$) as compared to the publicly insured. Additionally, a one unit increase in PSA is associated with $5,075 increase in cost ($p<0.05$). Correlations between race and imaging type and having received radical prostatectomy (RP) and imaging type were identified but were not statistically significant ($p<0.10$). **Conclusions:** Higher PSA was associated with lower likelihood for molecular imaging and higher cost in a one year time-frame. Higher cost was also associated with private insurance, but there was no clear relationship between insurance type and imaging type. This study identified several factors – which may impact prescription pattern – that are worth exploring within a larger patient sample; namely, race/ ethnicity and RP as determinants for receipt of molecular imaging. Research Sponsor: None.

298 **Poster Session (Board #L4), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Clinical utility of PSA density and PI-RADS for deferring biopsy for the detection of clinically significant prostate cancer.

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Background: We sought to identify PSA density (PSAD) and Prostate Imaging-Reporting and Data Systems (PI-RADS) category cut-offs that would allow deferring biopsy in men with suspicion for clinically significant prostate cancer (csPCa). **Methods:** Our institution's prostate MRI registry (n = 1718) was queried for patients who had MRI-guided biopsy (MRI-GB) and/or systematic biopsy (SB) performed after prostate MRI between January 2013 and October 2018 (n = 676). Patients in the diagnostic group (either biopsy naïve or with prior negative biopsy) and patients with PCa on active surveillance (AS) were considered eligible. PSA, PSAD, and PI-RADS category were entered into logistic regression models for predicting csPca (grade group [GG] $\geq$ 2) at biopsy. Receiver operating characteristic (ROC) analysis was performed to assess model accuracy and results were stratified by biopsy indication and PI-RADS categories. **Results:** Logistic regression models that combined PSAD and PI-RADS categories had the highest ROC's in both the diagnostic and AS groups (AUC=0.830 and 0.778, respectively). For diagnostic group patients with PSAD $\leq$0.15, csPCa was found in 6/89 (6.7%) of negative MRI patients (i.e. PI-RADS $\leq$ 2), 4/90 (4.4%) of PI-RADS 3 patients, 59/159 (37%) of PI-RADS 4-5 patients. If a PSAD cutoff of $\leq$ 0.15 and PI-RADS category $\leq$ 3 MRI were used in combination as criteria for biopsy deferral, only 10/526 (1.9%) of patients would have had csPCa missed on subsequent biopsy. Among patients in the AS group with a negative MRI, 0/22(0%) and 3/8 (37.5%) had csPCA if the PSAD was $\leq$0.15 and $>$0.15, respectively. **Conclusions:** For the diagnostic group of patients undergoing prostate biopsy, PSAD cut off $\leq$0.15 is useful for deferring biopsy only in patients with a PI-RADS $\leq$ 3. Confirmatory biopsy in patients should be strongly considered before enrolling patients in AS even in the setting of a negative MRI if the PSAD is $>$ 0.15. Research Sponsor: None.

299 Poster Session (Board #L5), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Five-year results from a phase I/II study of moderately hypofractionated intensity-modulated radiation therapy (IMRT) for localized prostate cancer including simultaneously integrated boost and pelvic lymph node (LN) coverage.

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Background: This study reports the 5 year toxicity and efficacy data of a phase I/II trial of moderately hypofractionated intensity modulated radiation therapy (IMRT) for localized prostate cancer utilizing a simultaneous integrated boost and pelvic lymph node (LN) coverage. **Methods:** Men with localized prostate cancer were prospectively enrolled and received IMRT to the prostate +/- seminal vesicles (SVs) +/- LNs based on National Comprehensive Cancer Network (NCCN) guidelines. Low-risk (LR) patients received 69.6 Gy in 29 fractions to the prostate alone; intermediate-risk (IR) and high-risk (HR) patients received 72Gy to the prostate, 54Gy to the SVs, and 50.4Gy to LNs (if risk of LN involvement $>$ 15% by the Roach formula) all in 30 fractions. IR and HR patients received androgen deprivation therapy. **Results:** Fifty-five patients were enrolled and 49 patients evaluable with a median follow up of 60 months. There were 11 (20%) LR, 23 (41.8%) IR, and 21 (38.2%) HR patients. Twenty-five patients (51%) received prostate and LN treatment. At 5 years, the cumulative incidence of late grade 2+ gastrointestinal (GI) and genitourinary (GU) toxicity was 22.6% and 38.2% respectively. Prevalence rates of late grade 2 GI toxicity at 1, 3, and 5 years was 5.8%, 3.9%, and 5.8% respectively. Late grade 2+ GI toxicities that did not resolve by 60 months included 3 out of 52 patients (5.8%). Prevalence rates of late grade 2 GU toxicity at 1, 3, and 5 years rates were 15.4%, 7.7%, and 13.5% respectively. There were 3 patients (5.8%) who experienced grade 3 GU toxicity and no grade 3 GI toxicities. The biochemical relapse free survival at 5 years for the cohort was 88.3%. There were no local, regional, or distant failures, with all patients still alive at last follow up. **Conclusions:** Moderate hypofractionation of localized prostate cancer utilizing a simultaneous integrated boost and LN coverage produces excellent biochemical control and acceptable acute/late toxicity. This phase I/II trial adds to maturing data with 5 year outcomes which justify its use for cost and patient convenience factors. Clinical trial information: NCT01117935. Research Sponsor: U.S. National Institutes of Health, Massey Cancer Center, and the Hunter-Holmes McGuire Veterans Administration Medical Center.

300 **Poster Session (Board #L6), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

18-year prostate cancer-specific mortality after prostatectomy, brachytherapy, external beam radiation therapy, hormonal therapy, or monitoring for localized prostate cancer.

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Background: The optimal treatment of localized prostate cancer (PCa) remains controversial. We compared long-term survival among men who underwent radical prostatectomy (RP), brachytherapy (BT), external beam radiation therapy (EBRT), primary androgen deprivation therapy (PADT), or monitoring (AS/WW) for localized PCa. **Methods:** Within the CaPSURE registry, we analyzed 12,062 men with localized PCa. PCa risk was assessed using the Stephenson preoperative nomogram and the Cancer of the Prostate Risk Assessment (CAPRA) score. Multivariable analyses were performed to compare prostate cancer-specific mortality (PCSM) and all-cause mortality (ACM) by primary treatment, adjusting for age and case-mix. An inverse probability weighted regression adjustment was used to reflect propensity for treatment assignment and any imbalances in censoring. **Results:** 6,357 men (53%) underwent RP, 1,351 (11%) BT, 1,716 (14%) EBRT, 1,605 (13%) PADT, and 1,033 (9%) AS/WW. During the 18-year follow-up period, 514 men died from PCa. Adjusting for clinical CAPRA score, the hazard ratios for PCSM relative to RP were 1.46 (95% CI, 1.00-2.12, p=0.050) for BT, 1.81 (95% CI, 1.43-2.30, $p<0.001$) for EBRT, 2.77 (95% CI, 2.18-3.51, $p<0.001$) for PADT, and 1.81 (95% CI, 1.23-2.66, p=0.003) for AS/WW. The greatest difference in PCSM between treatment modalities was observed for high-risk patients. Adjusting for age, comorbidity, and clinical CAPRA score, the hazard ratios for ACM were 1.46 (95% CI, 1.28-1.67) for BT, 1.38 (95% CI, 1.24-1.54) for EBRT, 1.89 (95% CI, 1.67-2.13) for PADT, and 1.60 (95% CI, 1.39-1.84) for AS/WW compared to RP (all $p<0.001$). Additional analyses using 100-Stephenson score or Fine-Gray competing risks analysis demonstrated similar results. **Conclusions:** In a large, prospective cohort of men with localized PCa, after adjustment for age and comorbidity, risk of PCSM and ACM was lowest after RP. Mortality was significantly higher after EBRT and AS/WW, and highest after PADT. RP should be offered as part of the management paradigm for high-risk disease, AS/WW should be preferred for most low-risk PCa. Research Sponsor: U.S. National Institutes of Health.

301 **Poster Session (Board #L7), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

PSA status after neoadjuvant androgen deprivation therapy before high-dose-rate brachytherapy as biomarker for prediction of long-term outcome in high-risk prostate cancer patients.

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Background: The aim is to investigate the clinical significance of biochemical response after Androgen Deprivation Therapy (ADT) prior to high-dose-rate brachytherapy (HDR-BT) for early identification of patients at increased risk of recurrence. Measured outcomes included biochemical relapse free survival (bRFS), distant metastasis free survival (DMFS) and overall survival (OS). **Methods:** A total of 324 patients with high-risk Prostate Cancer (PCa) were identified in the Norwegian Radium Hospital brachytherapy database. Neo-adjuvant ADT was administered for 3-6 months, followed by two 10 Gy HDR-BT treatments to the prostate, each spaced by two weeks, followed by conformal external beam radiation to 50 Gy to the prostate gland and seminal vesicles. Total length of ADT ranged from 12 to 36 months. PSA (ng/mL) and testosterone values (T, nmol/L) after 3-6 months of neo-adjuvant ADT were measured. Kaplan Meier and Cox regression analyses were performed. **Results:** Median age at diagnosis was 66 years and median follow-up was 10 years. At last follow-up, 277 patients (85,2%) were alive, 10 patients (3.1%) had died of prostate cancer and 37 patients (11.4%) died of other causes. 24 patients (7.4%) had biochemical relapse and 9 patients (2.8%) had distant metastasis within the first 5 years. Patients with PSA >1 after neo-adjuvant therapy had 4.3 (95%CI 1.7 to 11.1) higher odds of biochemical relapse within 5 years compared to patients with PSA <1 ($p = 0.002$). ROC analysis confirmed that PSA <1 had a prediction accuracy of 0.76 (sensitivity 68% and specificity 67%). T <0.7 and PSA <1 after neo-adjuvant therapy were associated with improved bRFS, DMFS and OS ($p < 0.001$). Neither the length of neo-adjuvant nor total ADT treatment impacted outcomes ($p > 0.05$). **Conclusions:** Dose intensification with 2 HDR-BT boosts resulted in excellent survival in our cohort. PSA >1 after neo-adjuvant ADT may be able to predict patients at increased risk of relapse and worse OS and identify patients in whom increased monitoring and/or intervention is warranted. ADT >1 year did not improve outcome, indicating that shorter course of ADT may be used. Research Sponsor: None.

302 **Poster Session (Board #L8), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

The Personalized Medicine for Prostate Cancer (PMPC) Study: The role of race, genomics, and patient complexity in treatment outcomes.

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Background: Matching of patients with optimal treatment for localized prostate cancer (PCa) requires accurate estimates of risk for progression or recurrence. Traditional risk assessment methods may underestimate risk for certain patient subgroups, (e.g. minorities). In the PMPC study, we replicated an expanded risk model, adding genomic data to improve risk prediction and optimize treatment assignment for PCa. **Methods:** A prospective cohort of 660 patients with early PCa was identified from 3 teaching hospitals and 2 VA Hospitals in Southern California. Risk model data were collected from electronic medical records, patient questionnaires and tissue-based genomic data provided by GenomeDx. Complexity variables included demographic characteristics, clinical markers (PSA levels, Gleason score), patient-reported health status measures (e.g. comorbidity burden, depression, stress) and Decipher score. We compared individual components of the complexity score for 425 Non-Hispanic White (NHW) and 104 African American (AA) men using t-tests. Composite complexity scores were derived from weights from general linear models. Mean complexity scores were compared using t-tests. **Results:** Compared with NHW men, AA men had statistically significantly more comorbidity, poorer health ratings, poorer physical functioning, more depression, less energy, more fatigue, more stress and less resilience. More AA men had Gleason scores >6 (60.0%) than NHW men (46.6%), p=.0134. Fewer AA men (41.5%) had 'low risk' Decipher scores compared to NHW men (53.8%). More AA men had high complexity scores compared with NHW men (63.4% vs. 45.1%, p=.008), however, there were no statistically significant differences in the proportion of NHW vs. AA men on active surveillance, 46.0% vs. 40.7%, p=.384. Using clinical variables alone there were no significant differences in low risk between NHW and AA men. **Conclusions:** The addition of genomic data improved the complexity model developed earlier. AA men may be at higher risk for suboptimal treatment than predicted by clinical variables alone. Data from the longitudinal cohort will test accuracy of model prediction for disease progression or recurrence. Clinical trial information: NCT03770351. Research Sponsor: California Initiative to Advance Precision Medicine.

303 **Poster Session (Board #L9), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A prospective study evaluating oral-only hormonal therapy with radiation for intermediate or high-risk prostate cancer in men age ≥ 70 years or with moderate comorbidity.

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Background: Androgen deprivation therapy (ADT) improves disease control in intermediate (IR) and high risk (HR) prostate cancer (PCa) treated with radiation therapy (RT), but also causes toxicity which may be worse in men of older age or with comorbidity. We hypothesized that dual agent ADT, replacing GnRH agonist for an oral 5-alpha-reductase inhibitor (5AR), would improve hormonal health-related quality of life (HRQOL) without compromising PCa outcomes. **Methods:** Patients with localized IR or HR PCa, age > 70 years and/or with Charlson comorbidity index (CCI) score > 2 were treated with bicalutamide and finasteride or dutasteride (oADT). A synchronous standard of care (SOC) cohort received bicalutamide and GnRH agonist. Median RT dose was 78 Gy. Dual agent ADT was given for 4 months (mo), while 5AR or GnRH agonist continued for an additional 2 years. The primary endpoint was the Expanded Prostate Cancer Index Composite (EPIC-26) hormonal HRQOL global score at 6 mo, with success defined as < 30% decline, requiring 40 men in the oADT group. Secondary endpoints included a log-rank comparison of freedom from biochemical failure (FFBF), and overall survival (OS). **Results:** Between 1/2011 and 8/2018, 40 and 30 men were prospectively enrolled in the oADT and SOC cohorts, respectively, with similar CCI scores > 2 (73% vs 66%, p=0.58), and age (mean 71, p=0.99). Median follow-up was 36 mo. Global scores for hormonal HRQOL at baseline, 6 mo, and 2 yr were 89, 88, 84 for the oADT group, and 92, 81, 83 for the SOC group; the declines from baseline to 6 mo (p=0.04) and 2 yr (p=0.05) were smaller in the oADT group. Sexual HRQOL was better preserved at 6 mo (p<0.01) in the oADT group, which maintained higher testosterone at 2 years (452 vs 44, p<0.01). There were no differences in urinary or bowel HRQOL. The 3-year FFBF was 90% vs 96% (p=0.83) and OS was 83 vs 86% (p=0.77) between the oADT and SOC groups, respectively. **Conclusions:** oADT improves hormonal and sexual HRQOL compared to SOC ADT in men age ≥ 70 or moderate comorbidity treated with RT. These groups could be further evaluated in a randomized comparison; post-ADT RNA expression to evaluate the relative biologic effects will be performed. Clinical trial information: NCT01342367. Research Sponsor: University of Chicago.

305 **Poster Session (Board #L11), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Acute patient-reported toxicities after proton therapy or intensity-modulated radiotherapy for prostate cancer.

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Background: Toxicity due to radiotherapy (RT) may differ in patients (pts) with prostate cancer who receive intensity-modulated radiotherapy (IMRT) or proton beam therapy (PBT). **Methods:** Patient-reported bowel function (BF), urinary incontinence (UI), and urinary irritative/obstructive symptoms (UO) domains of the Expanded Prostate Index Composite Questionnaire (EPIC-26) were prospectively collected in pts with localized prostate cancer receiving either IMRT (n=157) or PBT (n=105) to the prostate +/- proximal seminal vesicles for clinical stage T1-T2 N0 prostate cancer at a single tertiary cancer center between 2015 and 2018. Changes in domain scores were analyzed from pretreatment to the end of RT and 3 months post-RT, assessing the acute effects of each modality. A clinically relevant change was defined as a score change that exceeded 50% of the standard deviation of a baseline value. **Results:** At baseline there was no difference in the scores of BF, UI, and UO domains between IMRT and PBT cohorts. At the end of RT, pts treated with either modality had a statistically significant and clinically relevant worsening of BF and UO compared to baseline. Pts treated with IMRT experienced a significantly greater decrement in BF compared to the PBT cohort (-13 vs -9, $p<0.01$), including significantly more IMRT pts having a clinically relevant deterioration in BF compared to PBT pts (58% vs 40%, p=0.01). Though there was a statistically significant deterioration in UI in the IMRT cohort (-4, $p<0.001$), this did not reach the predefined threshold for clinical relevance. Three months following RT, the IMRT group continued to have statistically significant and clinically relevant worsening of BF (-9, $p<0.001$), whereas the change in BF domain score of the PBT cohort was no longer statistically significant or clinically relevant compared to baseline (-1, p=0.25). There were no statistically significant or clinically relevant changes in UO or UI in either cohort at three months when compared to baseline. **Conclusions:** Pts who received IMRT or PBT reported unique patterns of toxicity, and pts treated with IMRT had worse decrement in BF immediately after and three months following RT, compared to those treated with PBT. Research Sponsor: None.

306 **Poster Session (Board #L12), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Influence of node-positive disease after radical prostatectomy on biochemical recurrence and oncologic outcomes in men with prostate cancer.

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Background: The diagnostic and therapeutic value of pelvic lymph node dissection (LND) at radical prostatectomy (RP) remains unclear. Thus, we aim to characterize the oncologic value of LND and secondary treatment on oncologic outcomes for a contemporary cohort of men with nodal disease on surgical pathology at RP. **Methods:** Men who underwent primary RP with LND for PCa were identified and stratified by pN status. Detectable PSA was defined as a PSA>0.05 ng/ml within 2-6 months after RP. Multivariable Cox proportional hazards regression models were fit for biochemical recurrence-free survival (RFS), overall survival (OS), and PCa-specific mortality (PCSM). **Results:** Of 1,635 identified patients, 167 (10.2%) had nodal disease. Mean age at diagnosis was 62 years (SD 7.1). Median follow-up after RP was 31 months (IQR 13-58). Those with nodal disease had more extensive LND (mean 17.7, SD 8.3 vs mean 13, SD 7.6, p<0.01). The number of positive LNs was associated with worse 7-year outcomes [RFS, HR 1.2, 95% CI 1.1-1.2, p<0.01; OS, HR 1.2, 95% CI 1.1-1.4, p<0.01] but not PCSM (p=0.2) after adjustments. Median number of positive LN was 1 (IQR 1, 3) in pN1 patients. 31 (19%) had an UDT PSA after RP, 25 (15%) had UDT PSA and received adjuvant therapy, and 106 (66%) had a detectable PSA. On multivariable analysis, number of positive LNs (HR 1.1, 95% CI 1.0-12, p=0.02) and detectable PSA (vs UDT, HR 5.1, 95% CI 1.8-14.3, p<0.01) were associated with increased risk of recurrence after RP but not OS (p>0.05 for all). After salvage treatment, 7-year RFS, OS, and PCSM did not differ significantly between the groups (p>0.05 for all). **Conclusions:** In a contemporary cohort of men with pN1 disease, more extensive LND was not associated with improved outcomes. Amongst those who underwent secondary treatment after RP, UDT PSA after RP conferred greater biochemical recurrence free survival at 7 years. In this subset of men, adjuvant treatment was not associated with improved post-salvage biochemical or treatment-free survival. Further investigation into the potential therapeutic benefit of LND at RP is warranted to better estimate the potential risk overtreatment of men with nodal disease. Research Sponsor: None.

307 **Poster Session (Board #L13), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Clinical utility of biomarkers 4K score, SelectMDx and ExoDx with MRI for the detection of high-grade prostate cancer.

Vittorio Fasulo, Claire Marie de la Calle, Janet E. Cowan, Annika Herlemann, Carissa Chu, Adam John Gadzinski, Reuben Au Yeung, Alberto Saita, Matthew R. Cooperberg, Katsuto Shinohara, Peter Carroll, Hao Gia Nguyen; University of California, San Francisco, San Francisco, CA; UCSF, San Francisco, CA; University of California San Francisco, San Francisco, CA; Dept. of Urology, University of California San Francisco, San Francisco, CA; UCSF Medical Center, San Francisco, CA; IRCCS Humanitas Clinical and Research Hospital, Rozzano, Italy; University of California-San Francisco, San Francisco, CA; UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA

Background: Although adoption of new biomarkers and MRI has become widespread, their utility when deciding to biopsy is unclear. We aim to evaluate and compare 4K, SelectMDx, ExoDx and their added value when combined with prostate MRI in the detection of high-grade prostate cancer (HG PC) and avoidance of unnecessary biopsies. **Methods:** Patients referred for consideration of prostate biopsy at UCSF between 2016-2019 were enrolled and had either 4K, SelectMDx or ExoDx testing with/without MRI. Logistic regression and AUC were used to determine the performance of each biomarker in detecting HG PC ($\geq$Gleason grade (GG) 3+4). In the subgroup of patients that underwent biopsy, with PSA 2.5-10 and negative DRE, we determined the number of avoided unnecessary biopsies (with GG 3+3 cancer or no cancer) and missed HG PC for each biomarker with/without MRI. **Results:** A total of 896 patients were enrolled, 457 were biopsied. Mean age was 65.5 years, median PSA was 6.32. Logistic regression showed that having an abnormal biomarker score or PI-RADS 4/5 on MRI (P4/5) was strongly associated with finding HG PC: 4K OR 12.9 (CI 4.58-36.1), ExoDx OR 14.7 (CI 3.31-65.3), SelectMDx OR 3.62 (CI 1.44-9.11), P4/5 OR 6.20 (CI 3.93-9.79), TRUS $\geq$T2a OR 4.33 (CI 2.78-6.75), PSAD $>$0.15 OR 4.01 (CI 2.59-6.20), p$<$0.01). Combining biomarker and P4/5 lesion on MRI increased AUC for detecting HG PC. In the biopsy subgroup, a normal 4K or ExoDx test missed only 4-5% HG PC, while an abnormal test resulted in avoiding 14-20% unnecessary biopsies. Combining MRI with ExoDx or 4K missed 0-1.43% HG PC but avoided only 7-9% unnecessary biopsies (Table). **Conclusions:** 4K and ExoDx outperformed MRI and SelectMDx but combining the biomarkers with MRI resulted in the best predictive ability for detecting HG PC. Negative MRI avoided more biopsies than a normal 4K or ExoDxbut missed more aggressive cancers. Our data suggest that MRI alone is not sensitive enough to detect all HG PC and that 4K or ExoDx testing alone could be sufficient when deciding to proceed with biopsy. Research Sponsor: UCSF urology.

	% Avoided biopsies	% Missed HG PC
4K	14.2	5.7
ExoDx	19.7	4.35
SelectMDx	49.0	53.8
TRUS ≥T2a	46.5	26.3
PSAD >0.15	61.0	45.3
P4/5	54.2	35.7
4K and P4/5	6.85	1.43
ExoDx and P4/5	9.09	0
SelectMDx and P4/5	20.4	23.1

308 **Poster Session (Board #L14), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Contemporary racial disparities in PSA screening in a large, integrated health care system.

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Background: The USPSTF prostate cancer screening guidelines have changed significantly in the past decade, from a recommendation of do not screen in 2012 to a 2018 recommendation that focuses on shared decision making. Additionally, most guidelines further acknowledge that African American men should be screened more intensively than Caucasian men due to increased incidence of prostate cancer and increased prostate cancer mortality. Our objective was to characterize racial disparities in PSA screening in a large healthcare system with a diverse patient population to understand contemporary trends. **Methods:** This retrospective cohort study used data from the Atrium Health Enterprise Data Warehouse, which includes clinical records from over 900 care locations across North Carolina, South Carolina, and Georgia. Participants included all men $\geq$ 40 years seen in the ambulatory or outpatient setting during 2014-2018. PSA testing was determined through laboratory data. Clinical and demographic data were collected. Between-group comparisons were conducted using generalized estimating equations models to account for within-subject correlation. Statistical significance was defined as $p < 0.05$. **Results:** There were 582,846 individual men seen from 2014-2018, including 416,843 Caucasians (71.5%) and 85,773 African Americans (14.7%). Screening rates declined among all groups from 2014-2018 (see table). African American men were screened at a similar or lower rate than Caucasian men in each year (from 18.6% vs 19.0% in 2014 to 11.9% vs 12.2% in 2018, respectively). **Conclusions:** PSA screening declined significantly between 2014 and 2018. African American men screened at a similar or lower rate than Caucasian men each year. Given the consensus that African American men should be more intensively screened for prostate cancer, significant racial disparities remain in prostate cancer screening. Further study is warranted to understand patient, provider, and system factors that contribute to disparities in prostate cancer care and outcomes. Research Sponsor: None.

PSA Testing Rates (% of patients tested).

Year	Caucasian	African American	p-value
2014	19.0	18.6	0.86
2015	15.7	14.9	<0.01
2016	14.2	13.3	<0.01
2017	14.1	13.2	<0.01
2018	12.2	11.9	0.08

309 **Poster Session (Board #L15), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

The deleterious association between proton pump inhibitors and prostate cancer specific death.

Hanan Goldberg, Faizan Moshin, Refik Saskin, Girish S. Kulkarni, Alejandro Berlin, Miran Kenk, Christopher J.D. Wallis, Thenappan Chandrasekar, Zachary William Abraham Klaassen, Olli Saarela, Linda Penn, Shabbir M.H. Alibhai, Neil Eric Fleshner; Department of Urology, SUNY Upstate, Syracuse, NY; Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada; Institute for Clinical Evaluative Sciences, Toronto, ON, Canada; Division of Urology, Princess Margaret Cancer Center, University Health Network, University of Toronto, Toronto, ON, Canada; Radiation Medicine Program, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; Division of Urology, Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, ON, Canada; Department of Urology, Thomas Jefferson University, Philadelphia, PA; Division of Urology, Medical College of Georgia at Augusta University, Georgia Cancer Center, Augusta, GA; University of Toronto, Toronto, ON, Canada; Princess Margaret Cancer Centre, Toronto, ON, Canada; Princess Margaret Hospital, University Health Network, Toronto, ON, Canada; Division of Urologic Oncology, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada

Background: Proton pump inhibitors (PPIs) are a commonly prescribed class of medications. Although in-vitro and in-vivo data have shown PPIs to have anti-tumor effects, more recent studies suggest an increased cancer risk in several solid organs. Pantoprazole, a commonly prescribed PPI, has been shown to harbor a protective effect in human prostate cancer (PCa) cells. We aimed to investigate the effect of pantoprazole and other PPIs on PCa-specific death and additional PCa outcomes. **Methods:** In this retrospective, population-based cohort study, data were incorporated from the Institute for Clinical and Evaluative Sciences to identify all men aged 66 and above with a history of a single negative prostate biopsy between 1994 and 2016. We used multivariable Cox regression models with time-dependent covariates, to assess the effect of PPIs on PCa diagnosis, androgen deprivation therapy (ADT) use, and PCa-specific death. All models included other medications with a putative effect on PCa. All models were adjusted for age, rurality, comorbidity, and year of patient study inclusion. **Results:** Overall, 21,512 men were included, with a mean follow-up time of 8.06 years (SD 5.44 years). A total of 10,999 patients (51.1%) used a PPI. A total of 5,187 patients (24.1%) were diagnosed with PCa, 2,043 patients (9.5%) were treated with ADT, and 805 patients (3.7%) died from PCa. Pantoprazole was associated with a 3.0% (95% CI 0.3%-6,0%) increased rate of being treated with ADT for every six months of cumulative use, while any use of all other PPIs was associated with a 39.0% (95% CI 18.0%-64.0%) increased PCa-specific mortality. No significant association was found with PCa diagnosis. **Conclusions:** Upon validation of the potentially negative association of PPIs with PCa outcomes, the expansive use of PPIs may need to be reassessed, especially in PCa patients. Research Sponsor: None.

310 **Poster Session (Board #L16), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Deep learning using preoperative MRI information to predict early recovery of urinary continence after robot-assisted radical prostatectomy.

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Background: Urinary incontinence remains one of the most bothersome postoperative complications even after robot-assisted radical prostatectomy (RARP). We aimed to make a novel prediction system that can be used preoperatively to inform patients of the accuracy of early recovery of urinary continence after RARP using a deep learning (DL) model from magnetic resonance imaging (MRI) information and preoperative clinicopathological parameters. **Methods:** A retrospective cohort study was conducted on prostate cancer (PC) patients who had undergone RARP at our hospital between August 2015 and July 2019. Patients using no pads/no leakage of urine or the use of a safety pad within 3 months after RARP is categorized into "good" continence and others into "no good" continence. MRI DICOM data from axial, coronal and sagittal imaging as well as preoperative clinicopathological covariates (age, BMI, prostate volume, serum PSA level, Gleason score, clinical stage) were assessed. Supervised DL algorithms, which included AdaBoost, Naive Bayes, Neural Network, Random Forest, and SVM were trained and tested as binary classifiers (good or no good). To evaluate the DL models from the testing data set, their sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV), as well as area under the receiver operating characteristic curve (AUC) were analyzed. **Results:** Data were available for 497 patients in the study period. The AdaBoost DL algorithm using MRI information in addition to clinicopathological parameters had the highest performance with sensitivity at 92%, specificity at 77%, PPV at 79%, NPV at 91%, and AUC at 84% for predicting good continence, while that using clinicopathological parameters only had the performance with sensitivity at 50%, specificity at 69%, PPV at 60%, NPV at 60%, and AUC at 60%. **Conclusions:** Our results suggest that the DL algorithms using MRI imaging information are highlighted as an accurate method for strongly predicting early recovery of urinary continence after RARP. Thus, DL predictions may help allocation of treatment strategies for PC patients who dislike prolonged urinary incontinence after RARP. Research Sponsor: None.

311 **Poster Session (Board #L17), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Prostate cancer survivorship care plans: What we are failing to tell men after treatment?

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Background: Survivorship care plans (SCPs) present essential information about cancer treatment and follow-up recommendations for cancer survivors. We describe the completeness of prostate cancer SCPs and evaluate guideline concordance of follow-up recommendations. **Methods:** We analyzed 125 prostate cancer SCPs from an academic and community cancer center, abstracting demographics, cancer/treatment details and follow-up recommendations. Follow-up recommendations were compared to national guidelines. **Results:** Content provided in >90% of SCPs included cancer TNM stage; PSA at diagnosis; radiation treatment details (98% of men received radiation); and PSA monitoring recommendations. Potential treatment-specific side effects were listed for 69% of men who had surgery, 78% for androgen deprivation therapy (ADT) and 97% for radiation. The presence of post-treatment symptoms were noted in 67% of plans – several ADT-related side effects (e.g., bone thinning, cognitive changes, muscle atrophy) were noted for 0/21 men who completed all ADT. Guidelines recommend an annual digital rectal exam (DRE) with no physical exam otherwise specified. No SCPs specified DRE, but all 68 SCPs at the community site recommended at least annual follow-up visits with urology, radiation oncology, and primary care. Only 5/57 SCPs at the academic site specified follow-up visits (radiation oncology every 6 months). Guidelines recommend PSA testing every 6-12 months (optional 3 months if high risk) for 5 years, then annually; while duration was not specified in any SCPs, if applied to the first 5 years, 91% of SCP recommendations were guideline concordant, 7% suggested oversurveillance, and 2% were incomplete. In men who received ADT, guidelines recommend assessing bone density (by imaging or FRAX score), and goal testosterone level. Of 80 men who completed or had ongoing ADT, 2% were recommended for bone density imaging (0 had FRAX scores) and 19% for testosterone levels. **Conclusions:** SCP content is more complete for demographic and treatment summary information with gaps in addressing treatment effects and follow-up recommendations beyond PSA testing. These findings highlight the need to improve the quality of information in SCPs. Clinical trial information: NCT03035773. Research Sponsor: PCORI.

312 **Poster Session (Board #L18), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A prospective comparison of MRI-planned versus CT-planned radiotherapy for prostate cancer.

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Background: Chronic rectal toxicity significantly decreases the quality of life for men who receive radiotherapy for prostate cancer. The volume of rectum exposed to 70 Gy or more is a validated metric that predicts the risk of late rectal toxicity. We hypothesized that MRI as compared to CT-based prostate radiotherapy treatment planning can reduce the volume of rectum exceeding 70 Gy. **Methods:** This prospective study single arm study enrolled 15 men treated with external beam radiation therapy for localized prostate cancer. At the time of treatment planning a 3 Tesla T2-weighted magnetic resonance imaging examination of the prostate was obtained. A radiotherapy plan was designed by a medical physicist using identical constraints for both CT and MRI-based consensus volumes defined by a radiologist and radiation oncologist. The volume of rectum exposed to 70 Gy or more was calculated and compared using the paired Signed Rank Test. **Results:** The median age was 70 years (range 56-84), median PSA 7.3 ng/mL (range 3.2 – 22.1), and median prostate volume 40 mL (range 25 - 65) by transrectal ultrasound. Sixty percent (n=9) were intermediate risk and 40 percent (n=6) high risk by NCCN guidelines. The majority were either clinical stage T1c (n=7) or T2 (n=6). Two men had extracapsular extension (T3a). None of the participants had seminal vesicle invasion (T3b), rectal or bladder involvement (T4), or lymph node metastasis (N1). All 15 men enrolled on the study completed both a standard radiation planning CT and research MRI examination. For CT-based treatment plans the median volume of rectum receiving 70 Gy or more was 9.3 cubic centimeters (cc) [IQR 7.0 to 10.2] compared with 4.9 cc [IQR 4.1 to 8.7] for MRI-based plans. This resulted in a median volume reduction of 2.1 cc [IQR 0.5 to 5.3, $P < .001$]. **Conclusions:** MRI-planned prostate radiotherapy can reduce the volume of rectum receiving radiation doses in excess of tolerance (70 Gy or more) and should be considered in men who are at high risk for late rectal toxicity. Clinical trial information: NCT02470910. Research Sponsor: Research and Development Fund (F8352114) administered through the Department of Radiology at Brigham and WomenÃ¢â‚€â“¢s Hospital, Boston, MA.

313 **Poster Session (Board #L19), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A randomized phase III trial between adjuvant docetaxel and surveillance after radical radiotherapy (RT) for intermediate and high-risk prostate cancer (PC): Quality-of-life results (QoL) in SPCG-13 trial.

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Background: Six docetaxel cycles did not improve PSA relapse free survival as an adjuvant treatment after radical RT (Kellokumpu-Lehtinen EURURO-8532). Here we report SPCG-13 trials QoL results. **Methods:** A total of 376 PC patients (T2 with Gleason score (GS) 4+3, PSA>10; T2, GS 8-10 any PSA; or any T3) were randomised to receive either 6 cycles of docetaxel 75mg/m^2 every 3 weeks (Arm A, n=188) or surveillance (Arm B, n=188) after radical RT NTC006653848. Neoadjuvant/adjuvant ADT was mandatory. Primary end-point was a rising PSA > 2 ng/ml above the nadir. Patients were followed for 5 years with PSA every 3 months for two years and thereafter every 6 month. FACT-P QoL questionnaires were used at baseline, during and after docetaxel treatment and in the follow-ups (at 1 year, 2 years and 4 years after treatment) in both groups, and analysed using analysis of variance (ANOVA) models. **Results:** Median follow-up was 59.4 months (range 1 to 111 months). 147 (78.2%) patients completed all six cycles in arm A. Mean age was 66.2 years in Arm A and 66.4 years in Arm B. The total QoL scores at baseline did not differ between the Arms (mean 119.0, SD±18.9, n=177 vs 118.2, SD±18.1, n=180). In Arm A the total score declined to 116.3 (SD+15.2), at 24 weeks and was 118.5 (SD±21.3) after chemotherapy. In Arm B at 24 weeks the QoL score had increased to 123.3 (SD±19.2) and was significantly higher than in Arm A (estimated difference of 8.2 with p<0.0001, ANOVA model adjusted for baseline). However, in the first follow-up (1 year) the QoL score was same in both Arms (123.7 vs 123.6, respectively, p=0.344, ANOVA model adjusted for baseline) and remained at the same level during further follow-ups. The decline in QoL scores during the docetaxel treatment were seen only in two sub-scores; functional and physical. **Conclusions:** Adjuvant docetaxel did decrease the QoL of patients during the treatment. However, in the later follow-ups it increased to the same level as those patients without docetaxel treatment. These results further support our conclusions of showing no benefit from docetaxel as adjuvant treatment in this patient group after radical curative treatment. Clinical trial information: RT NTC006653848. Research Sponsor: Sanofi.

315 **Poster Session (Board #L21), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Quality of life outcomes from a phase III trial exploring optimal sequencing of androgen deprivation therapy with external beam radiotherapy in localized prostate cancer.

Soumyajit Roy, Scott Grimes, Libni Eapen, Choan E, Kyle Malone, Julia Craig, Scott Carlyle Morgan, Shawn Malone; The Ottawa Hospital Cancer Centre, Ottawa, ON, Canada; The Ottawa Hospital, Ottawa, ON, Canada; Ottawa Hospital Research Institute, Ottawa, ON, Canada

Background: Dose-escalated prostate radiotherapy (PRT) with androgen deprivation therapy (ADT) is a standard curative treatment for localized prostate cancer (LPCa). The optimal sequencing of these therapies is unclear. We report the patient-reported health related quality of life (HR-QoL) outcomes from a phase III study exploring optimal sequencing of PRT with ADT in LPCa. **Methods:** Newly diagnosed LPCa patients with Gleason score $\leq$7, clinical stage T1b-T3a, and PSA $<$ 30 ng/mL were randomized to receive PRT (76 Gy/38 fractions) with 6 months (mos) of ADT starting 4 mos prior to RT (NAHT arm) or concurrently with RT (CAHT arm). HR-QoL was assessed using EORTC QLQ-C30 and PR25 at baseline, q2 mos while on ADT, q4 mos for year 1 and 2 after ADT, q6 mos from year 3 to 5 and annually thereafter. Linear mixed modelling was applied to compare change in score (relative to baseline) over time. Wilcoxon rank-sum test was used to identify between-group difference in absolute scores, at 18, 36 and 60 mos. The statistical and clinical significance was set at $p \leq 0.01$ and 10-point threshold, respectively. **Results:** Overall 432 men were enrolled in the study and 393 (194 in NAHT and 199 in CAHT arm) were eligible for HR-QoL evaluation. There was a significant difference in the change in score of sleep disturbance due to urinary bother (least-squared mean: 3.9 vs. 7.6, P = 0.001) between the two arms. Although there were statistically significant differences in absolute scores of global QoL (18, 60 mos), cognitive (18, 60 mos), social and emotional functions (60 mo), sexual intimacy (18 mo) and fatigue (60 mo) favoring NAHT, the only clinically meaningful difference was noted in ejaculatory dysfunction at 18 (mean: 52.5 vs. 64.6), 36 (60.2 vs. 49.2) & 60 mos (61.4 vs. 50.9), respectively. **Conclusions:** We did not find any notable difference between the two arms with respect to score change over time in any of the HR-QoL metrics except sleep disturbance due to urinary bother. Clinically meaningful difference was noted only in the late absolute ejaculatory dysfunction score which favored the NAHT arm. Based on these findings, both NAHT and CAHT with PRT are reasonable standards of care for LPCa. Clinical trial information: DC-990-0082. Research Sponsor: AstraZeneca.

316 **Poster Session (Board #L22), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Efficacy and toxicity according to hormone therapy used in the CHHiP trial.

Alison Tree, Clare Griffin, Emma Hall, David P. Dearnaley, on behalf of the CHHiP Investigators; The Royal Marsden Hospital and The Institute of Cancer Research, London, United Kingdom; The Institute of Cancer Research, London, United Kingdom; Institute of Cancer Research and The Royal Marsden NHS Foundation Trust, London, United Kingdom

Background: CHHiP (CRUK/06/016) is a multicentre randomised controlled trial which investigated the use of moderately hypofractionated radiotherapy (RT) dose schedules for treatment of localised prostate cancer. 97% of participants (pts) had concurrent androgen deprivation therapy (ADT). Luteinising Hormone Releasing Hormone analogues (LHRHa) and bicalutamide 150mg (BIC) daily were permitted. This exploratory analysis investigates whether both ADT regimens show similar efficacy and whether BIC has the propensity to preserve erectile function. **Methods:** In CHHiP, 2700 pts received LHRH and 403 BIC, median duration 5.6 months. The primary endpoint was biochemical or clinical failure (BCF). ADT groups were compared with Cox regression adjusted forage, NCCN risk group, Gleason score,T-stage and stratified by RT dose. A key secondary endpoint was erectile function assessed by clinicians (LENTSOM subjective erectile function for vaginal penetration score) and pts (single items within UCLA-PCI and EPIC-50 questionnaires) at 2 years. 195/875 (22%) pts were excluded from this toxicity analysis as they had erectile dysfunction pre-ADT (grade (G) 3/4 LENTSOM). A chi square trend test compared ADT regimens. **Results:** Baseline demographics were similar except BIC pts were significantly younger (median 67 years BIC, 69 years LHRHa). With a median follow-up of 9.2 years, there was no evidence of a difference in BCF with an adjusted hazard ratio 0.95 (95% CI 0.75-1.20), p = 0.657. Eight year BCF rates were 80.7% (95%CI 79.0-82.2) and 80.3% (95%CI 75.8-84.0) for LHRHa and BIC pts respectively. At two years, LENTSOM erectile function was significantly worse ($p < 0.0001$) for LHRHa pts with 93/585 (16%), 95/585 (16%) and 125/585 (21%) G2, G3 and G4, compared to 3/68 (4%), 5/68 (7%) and 9/68 (13%) in BIC. At 2 years, the ability to have an erection, as reported by pts, was graded poor and very poor in 73/278 (26%) and 57/278 (21%) LHRHa pts and 5/23 (22%) and 4/23 (17%) in BIC pts (p = 0.584). **Conclusions:** There was no evidence of a difference in efficacy according to ADT received. BIC preserved clinician assessed (LENTSOM) erectile function at 2 years but patient reported outcomes did not show statistically significant differences with type of ADT. Clinical trial information: 97182923. Research Sponsor: Cancer Research UK, the Department of Health (UK) and the National Institute for Health Research Cancer Research Network.

317 **Poster Session (Board #M1), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Risk of secondary sarcoma after abdominopelvic cancer treatment: Results from a contemporary cohort.

Amanda Elizabeth Hird, Rano Matta, Diana E. Magee, Girish S. Kulkarni, Ronald Kodama, Sender Herschorn, Robert Nam; Division of Urology, Sunnybrook Health Sciences Center, University of Toronto, Toronto, ON, Canada; Division of Urology, Princess Margaret Hospital, University Health Network, University of Toronto, Toronto, ON, Canada; Division of Urology, University Health Network, Princess Margaret Hospital, University of Toronto, Toronto, ON, Canada

Background: Our objective was to explore the risk of sarcoma in a large cohort of patients with localized abdominopelvic cancer treated with radiotherapy (RT) compared to surgery. The risk of other secondary non-sarcoma solid organ tumors was also explored. **Methods:** This is a population-based retrospective cohort study examining the risk of sarcoma in patients with localized prostate, bladder, colorectal, cervical, uterine, and testis cancer between January 1, 2002-December 31, 2016. Multivariable Cox proportional hazard analysis was used to compare time from primary treatment (radical surgery or RT) to second cancer, adjusting for age, comorbidity, income quintile, and rurality, accounting for death as a competing risk. The standardized incidence rate (SIR) was calculated as the ratio of the observed divided by the age- and sex-stratified expected number of sarcoma cases from the Ontario population. **Results:** 173,580 patients were included (79,662 underwent surgery and 93,918 underwent RT). Most patients had genitourinary (51.4%) or colorectal cancer (39.9%) and 24.4% received chemotherapy. Overall, 332 sarcomas developed over a median 5.7 years (IQR: 2.2-8.9) and were more common in the RT group (239/93918 [0.3%]) compared to the surgery group (93/79662 [0.1%], $p<0.001$). RT exposure (unadjusted HR=2.67, 95%CI:2.10-3.40, $p<0.001$, adjusted HR=2.59, 95%CI:2.03-3.31, $p<0.001$) and perioperative chemotherapy use (HR=1.31, 95%CI:1.03-1.69, p=0.038) were associated with an increased relative rate of sarcoma. Patients who received RT had an increased risk of sarcoma compared to the general population (SIR=1.46, 95%CI:1.12-1.90, p=0.005). For our secondary outcome, patients who received RT had an increased hazard of developing a second non-sarcoma solid malignancy compared to patients who underwent surgery (HR=1.16, 95%CI:1.10-1.22, $p<0.001$). **Conclusions:** This is the largest cohort investigating sarcoma in patients with abdominopelvic cancer. Patients treated with RT have a markedly increased risk of sarcoma compared to the general population. RT was an independent risk factor for sarcoma and non-sarcoma second malignancy. Research Sponsor: None.

318 **Poster Session (Board #M2), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Adverse event profiles of apalutamide, enzalutamide, and darolutamide in SPARTAN, PROSPER, and ARAMIS: How confident are we about which drug is safest?

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Background: Apalutamide, enzalutamide, and darolutamide were approved for non-metastatic castration-resistant prostate cancer (nmCRPC) based on three randomized placebo-controlled trials that showed similar efficacy. Adverse event (AE) profiles have been invoked to differentiate the drugs but have only been informally compared. **Methods:** We accounted for baseline characteristics, AE collection and reporting, and statistical uncertainty when comparing AE risks in the drug and placebo arms of SPARTAN (NCT01946204), PROSPER (NCT02003924), and ARAMIS (NCT02200614). **Results:** Patients in SPARTAN, PROSPER, and ARAMIS had a similar median age (74 years in all studies), median PSA doubling time (3.7-4.7 months) and ECOG performance status (68-80% with ECOG 0). AEs were gathered consistently using CTCAE 4.0 or 4.03. However, PROSPER and ARAMIS reported AEs occurring in ≥5% of patients; SPARTAN reported AEs occurring in ≥15%. Trials also reported 5 to 14 'AEs of interest.' Of 34 AE types reported overall, only 10 were reported in all three trials. Absolute risks of adverse events in the placebo arms differed considerably. Compared to the placebo arm of SPARTAN, AEs were on average 44% less common in the placebo arm of PROSPER (95% CI, 28-56%) and 54% less common in the placebo arm of ARAMIS (95% CI, 41-64%), a difference not explained by length of follow-up. With lower event numbers, relative risk estimates were less precise with wider confidence intervals. For example, comparing treatment vs. placebo arms, the relative risk for fatigue, the most common AE, was 1.45 (95% CI, 1.16-1.80) in SPARTAN, 2.37 (95% CI, 1.86-3.04) in PROSPER, and 1.39 (95% CI, 1.01-1.91) in ARAMIS. Across all AE types, compared to SPARTAN, relative risks from PROSPER were 23% less precise and relative risks from ARAMIS were 30% less precise. **Conclusions:** While conducted in similar patient populations, these trials had remarkable differences in AE reporting and in absolute AE risks between placebo arms. Rather than indicating better safety, low absolute adverse event numbers decrease confidence in AE profiles. Published data are insufficient to differentiate the AE profiles of these agents in nmCRPC. Research Sponsor: Prostate Cancer Foundation Young Investigator Award; Department of Defense Prostate Cancer Research Program, Early-Investigator Research Award (W81XWH-18-1-0330).

319 **Poster Session (Board #M3), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Evaluating the tolerability of a simultaneous focal boost to the gross tumor in prostate SABR: A toxicity and quality-of-life comparison of two prospective trials.

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Background: Dose-escalated SABR to the whole prostate may be associated with better outcomes, but at a risk of increased toxicity. An alternative approach is to focally boost the dominant intraprostatic lesion (DIL) seen on MRI. We report the toxicity and quality of life (QOL) outcomes of two phase II trials of prostate and pelvic SABR, with or without a simultaneous DIL boost. **Methods:** The first trial treated patients with high-risk prostate cancer (PCa) to a dose of 40 Gy to the prostate and 25 Gy to the pelvis in 5 fractions. The second trial treated patients with intermediate-risk and high-risk PCa to a dose of 35 Gy to the prostate, 25 Gy to the pelvis, and a DIL boost up to 50 Gy in 5 fractions. Acute toxicities, late toxicities and QOL were assessed. **Results:** 30 patients were enrolled in each trial. In the focal boost cohort, the median DIL D90% was 48.3 Gy. There was no significant difference in acute grade ≥2 GI or GU toxicity between the two trials, or cumulative worst late GI or GU toxicity up to 24 months. There was no significant difference in QOL domain scores or minimally clinical important change between the two trials. **Conclusions:** Prostate and pelvic SABR with a simultaneous DIL boost was feasible and did not lead to a significant change in toxicity or QOL when compared to a cohort that did not receive a focal boost. Further follow-up will be required to assess long-term outcomes. Clinical trial information: NCT02911636. Research Sponsor: None.

320 **Poster Session (Board #M4), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A randomized phase II study of apalutamide (APA), androgen deprivation therapy (ADT), or APA + ADT in patients (pts) with biochemically relapsed (BCR) prostate cancer (PC).

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Background: While there is no standard therapy for BCR PC following local therapy, intermittent ADT is widely used. We evaluated utility of APA alone, ADT (luteinizing hormone–releasing hormone agonist [LHRHa]) alone, or APA + LHRHa in ADT-naïve BCR PC pts. **Methods:** Pts with BCR PC after primary definitive local therapy and prostate-specific antigen (PSA) doubling time (PSADT) $\leq$ 12 mo were randomized 1:1:1 to open-label 240 mg APA daily, LHRHa alone, or APA + LHRHa for 12 mo, followed by a 12-mo observation period off therapy. Pts were stratified by PSADT ($<$ 6 vs 6-12 mo) and age ($\leq$ 70 vs $>$ 70 y). Primary end point: mean change from baseline (BL) in health-related quality of life (HRQoL) per Functional Assessment of Cancer Therapy-Prostate total score at 12 mo. Secondary end points included PSA nadir $<$ 0.2 ng/mL by 7 mo, time to PSA progression (TTPpsa), and time to testosterone (T) recovery. **Results:** 90 pts (APA, n = 29; LHRHa, n = 30; APA + LHRHa, n = 31) were treated for median of 12 mo with similar distribution of BL characteristics across groups: 67% age $\leq$ 70 y; 67% PSADT $<$ 6 mo. There was no significant difference in HRQoL in APA vs LHRHa at 12 mo, or between LHRHa vs APA + LHRHa groups. At median follow-up of 30-33 mo, TTPpsa in APA, LHRHa, and APA + LHRHa groups was 26 mo, 31 mo, and 36 mo, respectively. Compared to LHRHa alone, APA + LHRHa resulted in a trend toward improved TTPpsa (HR [95% CI] 0.56 [0.23-1.36], p = 0.196), and APA alone resulted in a trend for shorter TTPpsa (HR 1.09 [0.49-2.43], p = 0.824). PSA nadir $<$ 0.2 ng/mL was reached in 89%, 89%, and 97% in APA, LHRHa, and APA + LHRHa pts. Median time to T recovery was similar in LHRHa and APA + LHRHa groups (23 mo vs 24 mo). Grade 3-4 adverse events (AEs) occurred in 17% of APA, 14% of LHRHa, and 29% of APA + LHRHa pts. The only grade 3-4 AE reported in $>$ 1 pt per group was hypertension (APA, 3%; LHRHa, 0; APA + LHRHa, 13%). **Conclusions:** Addition of APA to LHRHa resulted in a trend for longer TTPpsa and a higher proportion of pts achieving optimal PSA nadir without significant difference in HRQoL or time to T recovery. Observed AEs were consistent with known safety profiles. Results support further evaluation of APA + LHRHa for a specified duration in BCR PC. Clinical trial information: NCT01790126. Research Sponsor: Janssen Research & Development.

321 Poster Session (Board #M5), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

A comparison of sipuleucel-T (sip-T) product parameters from two phase III studies: PROVENT in active surveillance prostate cancer and IMPACT in metastatic castrate-resistant prostate cancer (mCRPC).

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Background: Sip-T is an FDA approved, autologous cellular immunotherapy for mCRPC, manufactured by activating peripheral blood mononuclear cells collected by apheresis and culturing them with PA2024 (PAP fused to human GM-CSF). Overall survival (OS) in mCRPC is positively correlated with key product parameters of sip-T: CD54 upregulation; CD54+ cell count; and total nucleated cell (TNC) count. Product parameters were amplified in men with earlier stage prostate cancer vs mCRPC, including increased T cell trafficking to the prostate (Fong L, JNCI 2014) and greater CD54 upregulation and larger immune responses (Antonarakis ES, Clin Can Res 2017). **Methods:** ProVENT (NCT03686683) will evaluate sip-T in men with Gleason grade 1/2 prostate adenocarcinoma receiving active surveillance (target, 450 men; randomized 2:1 to receiving sip-T or not). We evaluated apheresis and final key product parameters (CD54 upregulation; CD54+ cell count; and TNC count) for each infused product as well as cumulative values while also comparing with IMPACT (NCT00065442) study results. **Results:** This preliminary analysis describes data from the first 184 sip-T men in ProVENT. CD54 upregulation profiles were consistent between IMPACT and ProVent, peaking in week 2 products; however, values at each treatment week, and subsequently cumulative CD54 upregulation, were statistically significantly higher for ProVENT ($P<0.001$ per comparison; Table). The number of CD54+ cells was significantly greater at each treatment for both incoming apheresis as well as the final product, including cumulative values, in ProVENT compared to IMPACT ($P<0.001$ per comparison) as was TNC count ($P<0.001$ per comparison). **Conclusions:** This preliminary analysis of product parameters in ProVENT suggest sip-T potency is higher in pts undergoing active surveillance.Clinical trial information: NCT03686683. Research Sponsor: Dendreon Pharmaceuticals LLC.

	Mean (SD)		
Table	**ProVENT**	**IMPACT**	**P-Value**
Week 2 CD54 Upregulation	15.9 [4.9]	11.2 [4.2]	P<0.001
Cumulative CD54 Upregulation	39.1 [9.6]	26.9 [7.9]	P<0.001
Cumulative CD54+ Cells†	2638 [1099]	1940 [884]	P<0.001
Cumulative Total Nucleated Cells†	16,136 [4,880]	10,210 [3,652]	P<0.001

† x 10^6/L

322 **Poster Session (Board #M6), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Validation of biochemical definition of cure after low-dose rate prostate brachytherapy.

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Background: Prospectively collected outcome data for 14,196 patients with localized prostate cancer treated with LDR brachytherapy (BT) from 7 institutions were analyzed. For the 80% of patients with a 4 year PSA $<$ 0.2 ng/ml, 99% were free of clinical failure at 10 years and 96% at 15 years. We sought to validate this result with 2 independent data sets from mature prospective clinical trials. **Methods:** In the initial analysis, patients were treated with either BT alone (61%), or in combination with external beam radiotherapy (EBRT:8%), androgen deprivation (ADT:22%) or both (9%). 42% were low risk, 50% intermediate (IR) and 8% high risk(HR). KM analysis was carried out using clinical failure (local, distant, regional or biochemical triggering salvage) as endpoints for each of 4 PSA categories: PSA$<$0.2 ng/ml, PSA $>$0.2 to $<$ 0.5, PSA $>$ 0.5 to $<$ 1.0, and PSA$>$1.0 ng/ml. Results were compared to 12 year follow up data on a phase 2 trial of BT for IR prostate cancer (n=223; MDAnderson Cohort 1) and 10-year data from the BT arm of the phase 3 randomized ASCENDE RT trial (n=160, Cohort 2) for upper tier IR and HR prostate cancer. **Results:** The results of the initial KM analysis showed that for the 80% of patients with PSA $<$ 0.2 ng/ml at 4 years, 99% were free of recurrence at 10 years (95% CI: 98.4-99.1) and 96% at 15 years (95% CI: 95-97). The association of treatment success with PSA range was highly significant ($p<0.0005$). Independent validation against BT alone in IR patients (Cohort 1) confirmed that 99% of patients with PSA at 4 years $<$ 0.2 ng/ml were NED at 10 years (CI: 95.8-99.9). For the unfavorable IR and HR patients receiving 12 months ADT + pelvic EBRT and BT in ASCENDE-RT (Cohort 2), PSA $<$ 0.2 ng/ml at 4 years was associated with 96.7% (CI: 89.9-98.9) being failure free at 10 years. **Conclusions:** As over 80% of patients achieve a PSA $<$ 0.2 ng/ml at 4 years post-LDR BT, and this is associated with 97%-99% being disease free beyond 10 years, we suggest that this biochemical definition of cure be adopted for LDR brachytherapy patients with $\geq$ 4 years' follow-up. Research Sponsor: None.

323 **Poster Session (Board #M7), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Phase II trial of definitive radiotherapy with leuprolide and enzalutamide in high-risk prostate cancer.

Claire Marie de la Calle, Albert Chang, Ghezal Rashid, Anthony C. Wong, Alice Choi, Felix Y Feng, Alexander R. Gottschalk, Paul Lawrence Menzel, Peter Carroll, Hao Gia Nguyen; UCSF, San Francisco, CA; University of California, San Francisco, San Francisco, CA; Department of Radiation Oncology, University of California San Francisco, San Francisco, CA; Dept. of Radiation Oncology, University of California, San Francisco, San Francisco, CA; UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA; CPMC, San Francisco, CA; University of California-San Francisco, San Francisco, CA

Background: Adding enzalutamide to standard LHRH agonist and primary radiation therapy may improve the outcomes in patients with high-risk prostate cancer. **Methods:** All patients met at least 2 of the following criteria: stage cT3a/b, PSA≥20 ng/mL, Gleason Grade 8-10, ≥33% core involvement on biopsy; or had pelvic lymph node involvement ≥1cm on CT or MRI. All patients were started on 24 months of leuprolide and enzalutamide and then underwent 5 weeks of IMRT (whole pelvis, 45Gy total) followed by a brachytherapy boost. PSA, Testosterone (T) and basic labs were followed during and after treatment. Primary outcome was to assess the safety, tolerability, and feasibility of the protocol and PSA complete response (PSA-CR, defined as PSA nadir ≤0.3). Secondary outcomes included: time to biochemical recurrence (BCR) and progression free survival (PFS). **Results:** 16 patients were enrolled, 2 were not eligible and 3 withdrew before starting treatment. Mean age at enrollment was 68.6 years (SD 9.4). Median follow up time was 28.27 months (IQR 27.3 – 29.1 months). Median time to PSA-CR was 4.20 months (IQR 3.47 – 4.87 months). Currently all patients still have PSA-CR (Table), and none have BCR per ASTRO Phoenix criteria. All-cause, any grade adverse events (AE) were reported in all 11 (100%) patients with 4 (36.4%) experiencing grade 3 AE. One (9.09%) treatment related serious AE (seizure) occurred. There were no grade 5 AE (death related to AE). 4 subjects stopped treatment early due to: seizure, myalgias, hematuria and social reasons. Most patients however were able to complete the 24 months of leuprolide and enzalutamide: median treatment duration was 24.0 months (IQR 12.1 – 24.0 months). **Conclusions:** Most patients were able to tolerate and complete the entire 24 months of treatment as originally planned. Currently no patients have met criteria for PSA recurrence. Will plan to follow up patients until month 36 to help determine true BCR rates and PFS. Clinical trial information: NCT02508636. Research Sponsor: National Comprehensive Cancer Network (NCCN) Oncology Research Program, Pharmaceutical/Biotech Company.

	Mean	Median	Standard Deviation
Treatment Duration	19.4	24.0	6.37
Follow up	27.6	28.3	2.01
Starting PSA	40.6	18.8	47.5
Last PSA	0.06	0.06	0.05
Starting T	506	561	263
Last T	186	147	173
Time to PSA-CR	4.25	4.20	1.40

Treatment Duration - Follow up - PSA-CR in months; PSA in ng/mL; T in ng/dL

324 **Poster Session (Board #M8), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Biochemical relapse in very high-risk prostate cancer after radical prostatectomy and DC-vaccine loaded with tumor RNA, hTERT, and survivin.

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Background: Patients with very high-risk prostate cancer (VHR-PC) features experience worse outcome after radical prostatectomy. This study was designed to assess biochemical failure and toxicity of adjuvant dendritic cells vaccine (DCV) in prostate cancer patients who are at greatest risk for cancer progression. **Methods:** Twenty patients with pathological stage pT2 - pT3b and Gleason score 7B-10, pN0, pN+ or pNx were enrolled into the approved study DC-005. The primary end point was clinical failure. Ten patients were tested for disseminated tumor cells (DTCs) to the bone marrow before inclusion to the study. Three patients out of 10 patients had positive DTCs detection in bone marrow. The mean age of the cohort was 63 years (SD 6.9 years), and three patients had postsurgical pN1 status. Eighteen patients had two or more high-risk factors (ISUP grade 5, T3- stage and or PSA $>$ 20 ng/mL). Autologous dendritic cells were transfected with mRNA for hTERT, survivin and tumor mRNA. The DCV product was applied intradermally after curative intended surgery once per week the first months, then once per months the first year, thereafter every 3 months for two years or until biochemical progression (PSA relapse cut-off $\geq$ 0.3). **Results:** After 5 years follow-up (FU) 62% (12/20 patients) had not biochemically progressed and with a median FU of 69 months all patients included in the study are alive. Five patients were treated with salvage and one patient with adjuvant radiation treatment, three patients received limited ADT, and three patients are on first line ADT, none of those eight patients have experienced castration resistant prostate cancer. The toxicity was mild with no serious adverse event related to DCV. **Conclusions:** Adjuvant DCV mitigates the time to biochemical progression. These results appear favorably compared to historical controls in VHR-PC. The clinical outcomes of this study warrants a future enlarged clinical trial. Clinical trial information: NCT01197625. Research Sponsor: Health Region South Foundation.

325 Rapid Abstract Session, Thu, 4:30 PM-5:30 PM and Poster Session (Board #A5), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Eight-year outcomes of a phase III randomized trial of conventional versus hypofractionated high-dose intensity modulated radiotherapy for prostate cancer (CRUK/06/016): Update from the CHHiP Trial.

David P. Dearnaley, Clare Griffin, Isabel Syndikus, Vincent Khoo, Alison Jane Birtle, Ananya Choudhury, Catherine Ferguson, John Graham, Joe O'Sullivan, Miguel Panades, Yvonne L. Rimmer, Christopher D. Scrase, John Staffurth, Clare Cruickshank, Shama Hassan, Julia Pugh, Emma Hall, on behalf of the CHHiP Investigators; Institute of Cancer Research and The Royal Marsden NHS Foundation Trust, London, United Kingdom; The Institute of Cancer Research, London, United Kingdom; Clatterbridge Cancer Centre, Wirral, United Kingdom; Rosemere Cancer Centre, Royal Preston Hospital, Preston, United Kingdom; The Christie NHS Foundation Trust and University of Manchester, Manchester, United Kingdom; Sheffield Teaching Hospitals Foundation Trust, Sheffield, United Kingdom; Musgrove Park Hospital, Taunton, United Kingdom; Queen's University Belfast, Belfast, United Kingdom; Lincoln County Hospital, Lincoln, United Kingdom; Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom; Ipswich Hospital NHS Trust, Ipswich, United Kingdom; Velindre Hospital, Cardiff University, Cardiff, United Kingdom

Background: CHHiP is a non-inferiority trial to determine efficacy and safety of hypofractionated radiotherapy for localised prostate cancer (PCa). Five year results indicated that moderate hypofractionation of 60 Gray (Gy)/20 fractions (f) was non-inferior to 74Gy/37f (Lancet Oncology, 2016). Moderate hypofractionation is now an international standard of care but with patients remaining at risk of recurrence for many years, information on long-term outcomes is important. Here we report pre-planned analysis of 8 year outcomes. **Methods:** Between October 2002 and June 2011, 3216 men with node negative T1b-T3a localised PCa with risk of seminal vesical involvement $\leq$30% were randomised (1:1:1 ratio) to 74Gy/37f (control), 60Gy/20f or 57Gy/19f. Androgen deprivation began at least 3 months prior to radiotherapy (RT) and continued until end of RT. The primary endpoint was time to biochemical failure (Phoenix consensus guidelines) or clinical failure (BCF). The non-inferiority design specified a critical hazard ratio (HR) of 1.208 for each hypofractionated schedule compared to 74Gy/37f. Late toxicity was assessed at 5 years by RTOG and LENT-SOM scales. Analysis was by intention-to-treat. **Results:** With a median follow up of 9.2 years, 8 year BCF-free rates (95% CI) were 74Gy: 80.6% (77.9%, 83.0%); 60Gy: 83.7% (81.2%, 85.9%) and 57Gy: 78.5% (75.8%, 81.0%). For 60Gy/20f, non-inferiority was confirmed: HR_{60}=0.84 (90% CI 0.71, 0.99). For 57Gy/19f, non-inferiority could not be declared: HR_{57}=1.17 (90% CI 1.00, 1.37). Clinician assessments of late toxicity were similar across groups. At 5 years, RTOG grade$\geq$2 (G2+) bowel toxicity was observed in 14/879 (1.6%), 18/908 (2.0%) and 17/904 (1.9%) of the 74Gy, 60Gy and 57Gy groups respectively. RTOG G2+ bladder toxicity was observed in 17/879 (1.9%), 14/908 (1.5%) and 17/904 (1.9%) of the 74Gy, 60Gy and 57Gy groups respectively. **Conclusions:** With BCF rates over 80%, long-term follow-up confirms that 60Gy/20f is non-inferior to 74Gy/37f. Late side effects were very low across all groups. These results support the continued use of 60Gy/20f as standard of care for men with localised PCa. Clinical trial information: 97182923. Research Sponsor: Cancer Research UK, Department of Health (UK) and the National Institute for Health Research Cancer Research Network.

326 **Poster Session (Board #M10), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Significant localized reduction in cerebral blood flow (CBF) in regions relevant to cognitive function with enzalutamide (ENZA) compared to darolutamide (DARO) and placebo (PBO) in healthy volunteers.

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Background: DARO is an oral androgen receptor antagonist with a unique structure and a low blood–brain barrier penetrance noted in rodents. Here we compare CBF following administration of DARO, ENZA, and PBO using arterial spin labelled magnetic resonance imaging (ASL-MRI) in humans. **Methods:** This phase I, randomized, PBO-controlled, 3-period crossover study investigated drug-induced changes in CBF for brain grey matter and for specific regions related to cognitive function in healthy males (age 19–44). Twenty-three participants received a single oral dose of DARO, ENZA, or PBO at 6-week intervals at similar unbound concentrations. An ASL-MRI scan was performed ~4 hours after each dose. Blood samples for drug analysis and physiological measures were collected prior to drug administration and immediately post-scan. ASL data were preprocessed and statistical parametric modelling was used for treatment comparisons (paired t-tests). Whole-brain results were considered significant after correction for multiple comparisons. A linear mixed effects model was used for predetermined region of interest (ROI) analysis, with physiological parameters as nuisance regressors. **Results:** Drug-concentration data confirmed similar unbound exposure during MRI scans and a complete washout between treatments. No unexpected safety concerns were noted in the study. Whole-brain analysis showed a significant localized 5.2% reduction in CBF for ENZA in temporo-occipital cortices but no significant CBF reduction with DARO compared to PBO. A significant 5.9% localized reduction in CBF was measured for ENZA vs DARO. ROI analysis showed a significant reduction in CBF for ENZA vs PBO ($p = 0.045$) and for ENZA vs DARO ($p = 0.037$) in the left and right dorsolateral prefrontal cortices, respectively. A significant reduction was noted in CBF for ENZA vs PBO in right amygdala ($p = 0.047$). **Conclusions:** Compared to PBO and DARO, significant localized reductions in CBF were noted for ENZA. These results may be relevant to cognitive function (executive function, memory, and anxiety) with extended treatment and warrant further investigation. Clinical trial information: NCT03704519. Research Sponsor: Bayer HealthCare Pharmaceuticals.

327 **Poster Session (Board #M11), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Association of black race with improved outcomes following definitive radiotherapy with androgen deprivation therapy for high-risk prostate cancer: A meta-analysis of eight randomized trials.

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Background: Though Black men with prostate cancer are more likely to have aggressive disease features than White men, race-specific differences in initial treatment responses in localized disease remains unknown. **Methods:** Individual patient data were obtained for 9259 patients (including 1674 [18.1%] Black men and 7585 [81.9%] White men) enrolled on eight randomized controlled trials evaluating definitive radiotherapy (RT) ± short-term or long-term androgen deprivation therapy (STADT and LTADT). The primary endpoints were biochemical recurrence (BCR), distant metastasis (DM), and prostate cancer-specific mortality (PCSM). Fine-Gray subdistribution HR (sHR) models were developed to evaluate the cumulative incidences of all endpoints after stratification by National Comprehensive Cancer Network risk grouping. A meta-analysis was done to estimate pair-wise comparisons of treatments within and between Black and White men, after adjusting for age, Gleason score, clinical T stage, and initial PSA. **Results:** Black men were more likely to have NCCN high-risk disease at enrollment (656/1674 [39.2%] vs 2506/7585 [33%], $p<0.001$). However, within the high-risk stratum Black men had lower 10-year rates of BCR (46.1% vs. 50.4%, p=0.02), DM (14% vs. 21.6%, $p<0.001$), and PCSM (4.9% vs. 9.8%, $p<0.001$). After adjusting for age and disease characteristics, Black men with high-risk prostate receiving RT+STADT had lower rates of BCR (sHR 0.73, 95% CI 0.62-0.86, $p<0.001$), DM (sHR 0.64, 95% CI 0.49-0.84, p=0.001) and PCSM (sHR 0.49, 95% CI 0.25-0.95, p=0.04). There were no differences in BCR, DM, or PCSM among men receiving RT+LTADT. The interaction between race and the impact of adding STADT to RT alone on BCR was statistically significant (p=0.003). **Conclusions:** Black men enrolled on randomized trials with long-term follow-up have higher risk disease at enrollment, but have better BCR, DM, and PCSM outcomes with RT-based therapy compared with White men, particularly with the addition of STADT. Research Sponsor: None.

328 Poster Session (Board #M12), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Stereotactic pelvic radiotherapy with HDR boost for dose escalation in intermediate and high-risk prostate cancer (SPARE): Efficacy, survival, and late toxicity outcomes.

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Background: The ASCO/CCO guidelines recommend brachytherapy boost for all eligible intermediate- or high-risk localized prostate cancer patients. We present efficacy, survival and late toxicity outcomes in patients treated on a prospective, single institutional protocol of MRI dose painted HDR brachytherapy boost (HDR-BT) followed by pelvic stereotactic body radiotherapy (SBRT) and androgen deprivation therapy (ADT). **Methods:** A phase I/II study was performed where intermediate (IR) or high-risk (HR) prostate cancer patients received HDR-BT 15Gy x 1 to the prostate and up to 22.5Gy to the MRI nodule and followed by gantry-based SBRT 25Gy in 5 weekly fractions delivered to pelvis, seminal vesicles and prostate. ADT was used for 6-18 months. CTCAEv3 was used to assess toxicities and was captured q6months x 5 years. Biochemical failure (BF; nadir + 2 definition), nadir PSA, proportion of patients with PSA $<$ 0.4 ng/ml at 4 years (4yPSARR), incidence of salvage therapy, cause specific survival and overall survival were calculated. Day 0 was HDR-BT date for all time-to-event analyses. **Results:** Thirty-two patients (NCCN 3% favorable IR, 47% unfavorable IR and 50% HR) completed the planned treatment with a median follow-up of 50 months; 31 of these had an MRI nodule. Four patients had BF with actuarial 4-year BF rate of 11.5%; 3 of these received salvage ADT. Median nPSA was 0.02 ng/ml; 4yPSARR was 68.8%. One patient died (of prostate cancer) at 45 months. For late toxicities, grade 1, 2 and 3+ GU and GI toxicities were: 40.6%, 37.5%, 3% and 28.1%, 0%, 0%, respectively. **Conclusions:** This novel treatment protocol incorporating MRI-dose painted HDR brachytherapy boost and SBRT pelvic radiation for intermediate- and high-risk prostate cancer in combination with ADT is feasible, effective and well tolerated. Clinical trial information: 12345678. Research Sponsor: Prostate Cancer Canada.

Domain	Timing	SPARE	ASCENDE-RT BT arm
Genitourinary	Grade 2 (%)	38%	33%
	Grade 3 (%)	3%	21%
Gastrointestinal	Grade 2 (%)	0%	31%
	Grade 3 (%)	0%	8%
BF	5-year	19%	11%
CSS	5-year	96%	97%

329 Poster Session (Board #M13), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Impact of somatic *SPOP (*Speckle-Type POZ protein) mutation (mtSPOP) on response to systemic therapy and survival outcome in men with de novo metastatic castration-sensitive prostate cancer (d-mCSPC).

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Background: Men with metastatic castration resistant prostate cancer harboring somatic mutant *SPOP* (mt*SPOP*) have improved progression free survival (PFS) on abiraterone than those with wild-type *SPOP* (wt*SPOP*) (Boysen et al, CCR 2018; PMID: 30068710). We hypothesized that *mtSPOP* will be associated with improved response to systemic therapy and outcomes in mCSPC. **Methods:** This retrospective study included patients from 4 academic institutions. Eligibility criteria: receipt of standard androgen deprivation therapy (ADT) without intensification (chemotherapy or novel hormonal agents) for the diagnosis of d-mCSPC, no prior history or treatment for prostate cancer, and established *SPOP* status determined by targeted next-generation sequencing. PFS was defined per PCWG2 defined PSA or investigator assessed radiographic progression. Overall survival (OS) was calculated from date of starting ADT for d-mCSPC to date of death. Kaplan-Meier analysis and t-test were used to compare variables in these two cohorts. **Results:** Of 110 *mtSPOP* men with advanced prostate cancer identified, 37 had d-mCSPC of which 25 received ADT. Of 353 *wtSPOP* patients, 184 had d-mCSPC of which 97 received ADT. Baseline demographics and disease characteristic were similar (table). *mtSPOP* was associated with significantly improved PFS [35 vs. 14 months, HR 0.519 (95% CI 0.312-0.861), p=0.011] and OS [97 vs. 69 months, HR 0.4392 (95% CI=0.207-0.931); p=0.032] with ADT as compared to *wtSPOP* patients. **Conclusions:** Men with d-mCSPC with somatic *mtSPOP* have improved outcomes with ADT than those with *wtSPOP*. Once validated, these hypothesis generating data may aid with counselling and treatment selection, as well as patient stratification in future trials in d-mCSPC. Research Sponsor: None.

Baseline variables	Mutant SPOP (n=25)	Wild-type SPOP (n=97)	p-value
Median age of diagnosis in years (Range)	66 (48-81)	66 (45-89)	0.95
Gleason sum ≥ 8 (%)	95	87.2	0.35
PSA prior to starting ADT (ng/ml)	56	90	0.25

330 Poster Session (Board #M14), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

The risk of death from prostate cancer in men with Gleason Score 3+4 prostate cancer treated using brachytherapy with or without a short course of androgen deprivation therapy.

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Background: We evaluated whether the intermediate-risk factors of percentage of positive biopsies (PPB), clinical tumor category, and prostate-specific antigen (PSA) level, in addition to age, were associated with the risk of prostate cancer-specific mortality (PCSM) among men with Gleason 3+4 prostate cancer treated with brachytherapy (BT) alone or BT and a short course of androgen deprivation therapy (ADT). **Methods:** We conducted a prospective cohort study of 1920 consecutively treated men with Gleason 3+4 adenocarcinoma of the prostate who received BT or BT and a median of 4 months of ADT between 10/14/1997 and 5/28/2013. Separate multivariable Fine and Gray competing risks regression models among men treated with BT or BT and ADT were used to assess whether PPB, cT2b-T2c, and PSA of 10.1-20.0 ng/ml, in addition to age greater than the median of 70 years, were associated with the risk of PCSM after adjustment for comorbidity. **Results:** After a median follow-up of 7.8 years (interquartile range 5.2-10.4 years), 284 men (14.8%) had died, including 31 (10.9% of deaths) from PC of which 18 (58.1%) and 13 (41.9%) occurred in men treated with BT or BT and ADT, respectively. For men treated with BT alone, increasing PPB, PSA of 10.1-20.0 vs 4.0-10.0 ng/mL, and age $>$70 vs $\leq$70 years were significantly associated with an increased risk of PCSM (adjusted hazard ratio [AHR] 1.015 95% confidence interval [CI] 1.000-1.031, P=0.048; AHR 5.55, 95% CI 2.01-15.29, $P<0.001$; and AHR 3.66, 95% CI 1.16-11.56, P=0.03, respectively). The respective results for men treated with BT and ADT were AHR 1.009, 95% CI 0.987-1.031, P=0.44; AHR 4.17, 95% CI 1.29-13.50, P=0.02; and AHR 3.74, 95% CI 0.87-16.05, P=0.08. The clinical tumor category was not significantly associated with the risk of PCSM. **Conclusions:** Among men with biopsy Gleason score 3+4 PC, both age $>$70 years and PSA of 10.1-20.0 ng/ml were significantly associated with an increased risk of PCSM following BT, and adding 4 months of ADT may not be sufficient to mitigate this risk. Advanced imaging and targeted biopsy of suspicious areas should be considered to personalize treatment in order to minimize the risk of PCSM in these men. Research Sponsor: None.

331 **Poster Session (Board #M15), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Late toxicity and quality of life from GETUG-AFU 22 study.

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Background: Radical prostatectomy (RP) is recommended as a standard treatment for localized prostate cancer. However no recommendations exist for pts with immediate detectable PSA after RP. **Methods:** Pts with localized prostate cancer, treated by RP (R0 or R1), with a PSA level post-RP ≥0.2 ng/mL and ≤2 ng/mL at randomization and N0 M0 on imaging were included. Pts were randomized (1:1) to radiotherapy (RT) alone (RT arm) or 6 months degarelix hormone therapy (HT) with RT (RT+HT arm). RT consisted of pelvic irradiation (46 Gy in 23 Fr) with a boost on the prostate bed (66 Gy in 33 Fr). The primary endpoint was event-free survival (EFS). Acute and late toxicities were evaluated as secondary endpoints and scored using CTCAE V4.0 scale. Quality of life (QOL) was assessed with QLQ-C30 and QLQ-PR25 questionnaires at 12 and 24 months. Late toxicity was reported at 24 months. **Results:** From Jan-2013 to Sept-2015, 125 pts were included (RT arm: 64 pts; RT+HT arm: 61). Median follow up is 38 months (31.4; 44). The baseline characteristics are well-balanced between two arms: median age was 66 yrs (50-77), all men having an ECOG ≤1 (ECOG 0 in 92%), a median Gleason score of 7 (3-9), a median PSA of 0.3 ng/mL (0.09-1.82) post-RP and 0.6 ng/mL (0.12-3.65) at randomization. All pts received 33 Fr of RT. In the RT+HT arm 98.4% of pts received the 6 months of HT planned. All pts were eligible for safety analysis. At 24 months, no difference in late genitourinary (GU) or gastrointestinal (GI)toxicity was observed between the two arms (p=0.145) Grade 3 late toxicities were reported for 15/125 pts (12%): 8/64 pts (6.5%) in the RT arm and 7/61 pts (5.5%) in RT+HT arm (NS) and no toxicity grade >3 was observed. Evaluation of QOL was assessable at 12 and 24 months of FU for 80%/89% pts and 59%/77% pts in RT/RT-HT arms respectively. At 12 months QLQ-PR25 HT related symptoms was significantly more important in the RT-HT arm (p=0.04). At 24 months no significant difference in QLQC-30 or QLQ-PR25 analysis was reported. **Conclusions:**, At 24 months in this phase II trial no significant difference in GI/GU toxicity and.QOL was observed between the two arms. GETUG-AFU 22 efficacy analysis is still pending. Clinical trial information: NCT01994239. Research Sponsor: UNICANCER.

332 Poster Session (Board #M16), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Stereotactic body radiation therapy with androgen deprivation therapy for unfavorable-risk prostate cancer.

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Background: Current ASTRO consensus guidelines do not support routine use of SBRT in higher risk PC. However, the NCCN permits selective use of SBRT with ADT for unfavorable intermediate (UIR) and high (HiR) risk PC in cases where conventional/moderately fractionated radiation therapy (EBRT) present medical or social hardship. How SBRT+ADT compares to EBRT+ADT in UIR and HiR men is unknown. **Methods:** Men >40 years old with localized PC treated with RT and concomitant ADT for curative intent between 2004-2015 were analyzed from the National Cancer Database. Patients treated with brachytherapy or who lacked ADT or risk stratification data were excluded. A total of 558 men treated with SBRT (5 fractions, ≥7 Gy/fraction) versus 40,797 men treated with moderate or conventional EBRT (dose ≥60 Gy with ≤3 Gy/fraction) were included. Patients were stratified by UIR and HiR using NCCN criteria. Kaplan Meier and Cox proportional hazards were used to compare overall survival (OS) between RT modality, adjusting for age, race, and comorbidity index. **Results:** With a median follow up of 62 months, there was no difference in 5-year OS between men treated with SBRT versus EBRT regardless of risk group (UIR: 87.2% SBRT versus 87.0% EBRT, p=.40; HiR: 80.4% SBRT versus 80.8% EBRT, p=.21). On multivariable analysis, there was no difference in risk of death for men treated with SBRT compared to EBRT (UIR: adjusted HR 1.09, 95% CI 0.68-1.74, p=.72; HiR: adjusted HR 0.93, 95% CI 0.76-1.14, p=.51). **Conclusions:** We found no difference in survival between SBRT+ADT and standard of care EBRT+ADT for UIR or HiR PC. Randomized trials of SBRT versus EBRT, with standard concomitant ADT, in these risks groups are needed. If prospectively validated, more widespread use of SBRT for higher risk PC may be warranted, especially in an era of cost-effective care. Research Sponsor: None.

333 Poster Session (Board #M17), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Adjuvant docetaxel for high-risk localized prostate cancer: Update of NRG Oncology/RTOG 0521.

Howard M. Sandler, Theodore Karrison, A. Oliver Sartor, Leonard G. Gomella, Mahul B. Amin, James Purdy, Jeff M. Michalski, Mark Garzotto, Nadeem Pervez, Alexander G. Balogh, George Rodrigues, Luis Souhami, M. Neil Reaume, Scott Williams, Raquibul Hannan, Christopher U. Jones, Eric M. Horwitz, Joseph P. Rodgers, Felix Y Feng, Seth A. Rosenthal; Cedars-Sinai Medical Center, Los Angeles, CA; University of Chicago, Chicago, IL; Tulane Cancer Center, New Orleans, LA; Department of Urology, Sidney Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA; University of Tennessee Health Science Center, Memphis, TN, USA, Memphis, United States Minor Outlying Islands; UC Davis, Sacramento, CA; Washington University in St. Louis School of Medicine, St. Louis, MO; Portland VAMC, Portland, OR; Cross Cancer Institute, Edmonton, AB, Canada; Tom Baker Cancer Center, Calgary, AB, Canada; London Regional Cancer Program, London, ON, Canada; Montreal General Hospital, Montreal, QC, Canada; Ottawa Hospital Cancer Centre, Ottawa, ON, Canada; Peter MacCallum Cancer Centre, Melbourne, Australia; University of Texas Southwestern Medical Center, Dallas, TX; Sutter General Hospital Accruals-Radiological Associates of Sacramento, Sacramento, CA; Fox Chase Cancer Center, Philadelphia, PA; NRG Oncology Statistics and Data Management Center, American College of Radiology, Philadelphia, PA; UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA; Sutter General Hospital, Sacramento, CA

Background: High-risk, localized prostate cancer has a poor prognosis. We hypothesized that adj docetaxel (D) and prednisone and long-term (24 mos) androgen suppression (AS) and radiation therapy (RT) would improve overall survival (OS) and tested this in NRG/RTOG 0521. Results with med follow-up of 5.7 yrs were reported (JCO 37:1159, 2019), showing a benefit of D (HR=0.69, 90% CI: 0.49-0.97, 1-sided p=0.034). Med follow-up is now 10.4 yrs and we report updated results for OS and metastasis (DM). **Methods:** NRG/RTOG 0521 opened 12/05 and closed 8/09 with targeted accrual of 600 and designed to detect a HR of 0.49, based on improvement in 4-yr OS from 86 to 93%. With 0.05 1-sided type I error and 90% power $>$78 deaths were required. Pts were stratified by predefined risk groups. Group 1: GI 9-10, any T; Group 2: GI 8, PSA$<$20, T$\geq$T2; Group 3: GI 8, PSA$\geq$20, any T; Group 4: GI 7, PSA$\geq$20, any T. maxPSA $\leq$150. RT dose was 75.6 Gy. Chemo consisted of 6, 21-day cycles of D starting 28 days after RT. **Results:** Of 612 accrued, 563 were eligible/available for analysis. By risk group 1-4, there were 297, 116, 64, and 86 pts. Med PSA 15 ng/mL. 10-yr OS rates were 64% [95% CI: 58-70%] for AS+RT and 69% [95% CI: 63-75%] for AS+RT+CT (HR = 0.89, 90% CI: 0.70, 1.13, 1-sided p=0.22). However there was evidence of non-proportional hazards (Grambsch-Therneau test, p=0.016). Thus survival was alternatively evaluated with restricted mean survival time (RMST). The difference in RMST at 10 yrs was 0.42 yrs (90% CI: 0.07-0.77, 2-sided p=0.048). Cumulative incidence of DM at 10 yrs was 22% [95% CI: 17-27%] for AS+RT and 20% [95% CI: 15-25%] for AS+RT+CT (2-sided log-rank p=0.29). At 10 years most deaths occurred in risk group 1: 62 in AS+RT and 50 in AS+RT+CT (HR= 0.93, 95% CI: 0.66-1.32, 2-sided log-rank p=0.16). There was no new related Grade 5 toxicity. **Conclusions:** OS findings, reported after follow-up of 5.7 yrs, demonstrated a small beneficial effect of adding D to AS and RT. With longer follow-up the benefit of D remains, but the HR varies over time and the OS curves have converged. Support: U10CA180868 (NRG Operations), U10CA180822 (NRG SDMC), U24CA180803 (IROC) from the NCI and Sanofi-Synthelabo Int. Clinical trial information: NCT00288080. Research Sponsor: U.S. National Institutes of Health, Pharmaceutical/Biotech Company.

334 Poster Session (Board #M18), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Phase II trial of neoadjuvant chemohormonal therapy (NAC) in prostate cancer (PC) with response assessment using PSMA PET/MRI.

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Background: Previous studies have shown that addition of docetaxel to androgen deprivation therapy (ADT) significantly improves progression-free survival (PFS) and overall survival (OS) in men with metastatic hormone-sensitive PC. Removal of the primary may also improve outcomes by reducing tumor self-seeding. We are conducting a phase II trial in men with PC to examine the feasibility of NAC, response using PSMA PET/MRI imaging and molecular mechanisms of resistance. **Methods:** This is an open-label, single-arm trial. Thirty patients with newly diagnosed very high risk localized, locally advanced or oligometastatic PC will receive ADT/docetaxel for three cycles before prostatectomy. The primary endpoint is rate of complete pathologic response. Key secondary objectives include PSA recurrence at month 12 after surgery. Exploratory objectives include tumor response and response heterogeneity in primary and metastatic tumors before and after treatment assessed by PSMA PET/MRI and evaluation of gene expression signatures in cancer cells, prostate stroma, bone marrow microenvironment and circulating tumor cells. **Results:** To date, 26 of 30 patients have enrolled and completed treatment. Mean age was 61 and mean PSA at time of diagnosis was 32.1 ng/dl. All patients had multi-focal prostate cancer with 23/26 patients with Gleason Grade Group 5. Metastatic disease by conventional imaging was identified in 6/26 patients (5 in lymph nodes [LN] and bone, 1 in LN only). Treatment was overall well tolerated. All patients had multi-focal primary prostate cancer detected on PSMA PET/MRI. All patients had a decline in PSMA PET SUV_{max} in at least one intraprostatic lesion. Two patients had an increase in SUV_{max} in at least one intraprostatic lesion that correlated with a resistant tumor focus on histopathology. **Conclusions:** NAC prior to surgery generates high rates of local tumor control with a heterogeneous response between foci. Primary resistance, identified by increasing PSMA PET $SUV_{max,}$ is uncommon, however incomplete responses were observed in nearly all patients, suggesting that more cycles of treatment would improve response. PSMA PET/MRI can be used to monitor response and resistance in PC. Clinical trial information: NCT03358563. Research Sponsor: Department of Defence, University of Wisconsin Carbone Cancer Center.

335 **Poster Session (Board #M19), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A systematic review and network meta-analysis of FDA approved treatment options in men with nonmetastatic, castration-resistant prostate cancer (MOCRPC).

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Background: Network meta-analysis can provide useful evidence for relative efficacy and toxicity of different treatment options in absence of head-to-head trials. Previously, we reported no difference in efficacy between Apalutamide (APA) and Enzalutamide (ENZA). In this analysis, we provide updated indirect comparisons of all FDA approved agents (APA,ENZA, Darolutamide(-DARO) for the treatment of MOCRPC with rapid PSA doubling time. **Methods:** MEDLINE, EMBASE and Cochrane Library were searched to identify relevant clinical trials. Hazard ratios (HR) and 95% confidence interval (CI) for Metastasis Free Survival (MFS), Overall Survival (OS) and data on grade 3 or higher AEs were abstracted. Bayesian network meta-analysis was conducted using WinBUGS 1.4.3 software (MRC Biostatistics Unit, Cambridge, UK) to perform an indirect comparisons. Risk for bias was assessed using the Cochrane Collaboration's tool. **Results:** Three RCTs (SPARTAN, PROSPER and ARAMIS) compared APA, ENZA and DARO respectively in combination with ADT to ADT alone. A total of 4117 patients were included in efficacy analysis (2694 received novel hormonal agents and 1423 received ADT and placebo). There were no statistically significant differences in MFS (HR 0.97, 95% CrI 0.74 - 1.30) between APA and ENZA; however, both APA 0.69 (95% CI 0.52 -0.92) and ENZA 0.71 (95% CrI 0.53, 0.92) significantly improved MFS as compared to DARO. There were no statistically significant differences in OS between these drugs. DARO had fewer grade 3 or higher adverse events of fatigue (HR 0.09, 95% CrI 0.01 – 0.51) compared to ENZA. However other common adverse events such as hypertension, falls, coronary artery disease/myocardial infarction and diarrhea were not significantly different between treatment groups. There was low risk of bias amongst included studies. **Conclusions:** APNA and ENZA provide significant improved in MFS as compared to DARO in patients with MOCRPC. The drugs have similar toxicity profile except that DARO was associated with lower incidence of fatigue compared to ENZA. Cost effective analysis of these drugs will be reported separately. Research Sponsor: None.

336 Poster Session (Board #M20), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Biopsy positivity in prostate cancer patients undergoing mpMRI-targeted radiation dose escalation.

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Background: Radiation (RT) dose escalation improves prostate cancer outcomes, but when the whole gland is treated to high doses complications can arise. We used prostate multiparametric MRI (mpMRI) findings for targeted dose escalation (MTDE) in prospective clinical trials in which prostate biopsy at 2-3 years after completion of RT was planned. Biopsy positivity is a known predictor of biochemical failure. These findings are compared to those in another cohort in which standard whole gland RT doses were used. **Methods:** Patients enrolled on three investigator initiated clinical trials incorporating MTDE (n=30) were eligible for inclusion. All patients were assessed for response by prostate biopsy 2-3 years after RT. Patients were compared to a reference group treated with standard RT doses to the whole prostate on a randomized trial at Fox Chase Cancer Center (FCCC trial). Univariable and multivariable analysis (MVA) was performed to assess for correlation with biopsy positivity, defined as carcinoma with or without RT effect. **Results:** Of those treated with MTDE: 3 (10%) were low, 23 (77%) intermediate, and 4 (13%) high risk. Assuming an α/β ratio of 1.5, MTDE patients received an equivalent dose (EQD2) of 76 Gy to the prostate, with focal dose escalation to an EQD2 of 98-122 Gy to mpMRI lesions. The MTDE cohort was compared with 115 patients from the FCCC trial, where 23 (20%) were low, 74 (64%) intermediate, and 18 (16%) high risk. The FCCC trial patients received an EQD2 of 76 Gy (n=64) or 84.24 Gy (n=51) without boost. Median time from RT to biopsy was 2 years (range, 1.6-3.3). The post-treatment biopsy results were negative in 50% (n=73), atypical in 12% (n=17), carcinoma with RT effect in 31% (n=45) and frank carcinoma in 7% (n=10). On MVA, patients with tumor volume $>$20% were more likely to have positive post-RT biopsies (OR: 3.21, 95% CI: 1.34-7.68, p= 0.009). MTDE patients were less likely to have positive post-RT biopsies, 10% vs. 45%, (OR: 0.13, 95% CI: 0.03-0.46, p=0.002). **Conclusions:** Focal dose-escalation to mpMRI-defined lesions significantly reduces biopsy positivity, a measure associated with long term outcomes including distant metastasis. Research Sponsor: None.

337 **Poster Session (Board #M21), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Clinical-genomic sub-classification of high-risk prostate cancer: Implications for tailoring therapy and clinical trial design.

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Background: Current risk stratification schema have limited prognostic performance in predicting outcome within National Comprehensive Cancer Network (NCCN) high-risk to very high-risk prostate cancer. **Methods:** Two multicenter high-risk cohorts were used for training (n = 214) and validation (n = 151) of a novel RNA microarray-based integrated clinical-genomic Classifier Optimized for Outcome in High-risk Prostate cancer (COOHP) to classify patients as COOHP favorable high-risk, standard high-risk, or very high-risk. Cox analysis was used to model metastasis-free survival (MFS), prostate cancer-specific survival (PCSS), and overall survival (OS). Model performance was compared to prior sub-classification systems using time-dependent c-indices. **Results:** Among NCCN high/very high-risk patients in the training cohort, 11% were classified as COOHP favorable high-risk, 70% as COOHP standard high-risk, and 18% as COOHP very high-risk. Patients with COOHP favorable high-risk disease had better rates of 5-year MFS compared to those with COOHP standard high-risk disease (94% vs 76%, hazard ratio [HR] 0.10, p = 0.02), and patients with COOHP very high-risk disease had worse 5-year MFS compared to those with COOHP standard high-risk disease (34% vs 76%, HR 3.5, $p < 0.0001$). Similarly, patients with COOHP very high-risk disease had worse 10-year PCSS compared to those with COOHP standard high-risk disease (36% vs 82%, HR 4.4, $p < 0.0001$). The c-indices for 5-year MFS and 10-year PCSS in the training cohort were 0.80 and 0.74, significantly improved compared to prior clinical and clinical-genomic risk stratification systems (0.62-0.69 for 5-year MFS and 0.56-0.63 for 10-year PCSS). These results were consistent in the validation cohort, where 5-year MFS significantly varied among the three COOHP subgroups (100% vs 89% vs 79%, p = 0.020), as did 10-year OS (100% vs 71% vs 53%, p = .040). **Conclusions:** A clinical-genomic risk stratification system specifically designed to discriminate prognosis in high-risk prostate cancer better identified favorable high-risk and very high-risk subsets of disease compared to prior clinical and clinical-genomic stratification systems. Research Sponsor: None.

338 Poster Session (Board #M22), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Loss of *SNAI2* in prostate cancer and effect on patient response to androgen deprivation therapy.

Niall Corcoran, Marek Cmero, Natalie Kurganovs, Patrick McCoy, Anthony Costello, Andrew Ryan, Phillip Parente, Christopher Hovens; University of Melbourne, Parkville, Australia; Division of Bioinformatics, Walter and Eliza Hall Institute, Melbourne, Australia; University of Melbourne, Melbourne, VIC, Australia; University of Melbourne, Melbourne, Australia; TissuPath, Melbourne, Australia; Eastern Health and Monash University Eastern Health Clinical School, Melbourne, Australia

Background: Androgen receptor (AR) signalling is important in prostate cancer progression, and therapies that specifically target this pathway are the mainstay of treatment for advanced disease. Treatment however is non-curative, and resistance develops inevitably with time. Although the mechanisms that drive castration resistant disease have been intensively analysed, how tumours survive and persist during the initial pathway inhibition is unclear. **Methods:** To track this process in detail we performed a Phase II neo-adjuvant study of a novel combination of AR targeting therapies (degarelix & abiraterone & bicalutamide) for 6 months prior to prostatectomy in men with high risk, localised disease. To determine what was driving tumour persistence in poorly responding patients, we comprehensively characterised pre- and post-treatment samples using both whole genome and RNA-sequencing, validating pertinent findings by qRT-PCR, IHC and FISH. **Results:** Despite universal 'biochemical responses', objective responses to treatment as measured by residual tumours volumes were highly variable. This state which we term 'castration-persistence', is molecularly distinct from 'castration-resistance', and is characterised by global transcriptional reprogramming leading to a transitional EMT state. Whole genome sequencing confirms tumour persistence is not associated with the emergence of a 'driver' lesion, rather treatment response is associated with regression of a 'treatment sensitive' subclonal population, defined by deletion of the EMT master regulator *SNAI2*. The extent of treatment response observed was determined by the prevalence of cells with loss of *SNAI2* in pre-treatment biopsies. **Conclusions:** Cell plasticity with transition to a mesenchymal phenotype defines prostate cancer cell survival to acute AR signalling inhibition. Tumour response is determined by the proportion of cells present harbouring defects in this program. Research Sponsor: National Health and Medical Research Council, Other Foundation, Other Government Agency.

339 **Poster Session (Board #N1), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

The intraprostatic immune balance after prostate SBRT in patients.

Nicholas George Nickols, Ekambaram Ganapathy, Christine Nguyen, Nathanael Kane, Lin Lin, Silvia Diaz-Perez, Ramin Nazarian, Amar Upadhyaya Kishan, Christopher R. King, Patrick Kupelian, Matthew Rettig, Michael L. Steinberg, Minsong Cao, Beatrice Knudsen, Fang-I Chu, David Elashoff, Robert Evan Reiter, Dörthe Schaue; University of California Los Angeles David Geffen School of Medicine, Los Angeles, CA; UCLA David Geffen School of Medicine, Los Angeles, CA; Cleveland Clinic, Cleveland, OH; Department of Radiation Oncology, University of California, Los Angeles, CA; UCLA School of Medicine, Los Angeles, CA; University of California Los Angeles Health Syst, Los Angeles, CA; UCLA Jonsson Comprehensive Cancer Center, Los Angeles, CA; University of California, Los Angeles, Los Angeles, CA; Cedars-Sinai Medical Center, Los Angeles, CA; University of California Los Angeles, Los Angeles, CA; Institute of Urologic Oncology, University of California, Los Angeles, Los Angeles, CA

Background: Stereotactic Body Radiotherapy (SBRT) delivers high dose per fraction radiotherapy to targets with high precision. Such hypofractionated RT appears to act as an immune adjuvant, altering the tumor infiltrating immune landscape and enriching it for lymphocytes as numerous preclinical investigations would suggest. Based on this hypothesis, hundreds of ongoing trials listed in clinicaltrials.gov currently test the combination of RT (largely SBRT) with various immunotherapies. However, studies directly measuring the representation of infiltrating immune cells after SBRT in patients are few and far between and none exist in the context of prostate cancer. We therefore sought to interrogate the tumor-immune interface after prostate SBRT using fresh tissue in patients. **Methods:** Fresh prostate tissue from patients (N=10) enrolled in a clinical trial of prostate SBRT (three fractions of 8 Gy directed to the prostate and seminal vesicles) in the neoadjuvant setting two weeks prior to radical prostatectomy was subjected to multicolor flow cytometry and compared to that of Gleason Grade and T stage matched controls who did not undergo neoadjuvant therapy. **Results:** With a threshold of significance level of 0.05 for unadjusted p-values, using two-sided two-sample t-test, myeloid cells and particularly $CD14^{+/hi}CD16^{+}DR^{+}$ intermediate monocytes/macrophages were enriched, while lymphocytes, including T cells and $CD56^{+}16^{-}$ NK cells were decreased in SBRT-treated prostates as compared to unirradiated controls. **Conclusions:** The immune infiltrates in prostates two weeks after SBRT demonstrates a significant lymphoid to myeloid shift consistent with a tumor microenvironment after SBRT that is likely immunosuppressive beyond what can be targeted through the PD-1/L1 or CTLA-4 axis alone. This may have implications for the design of immunotherapy trials, especially in prostate cancer, that test SBRT in combination with immunotherapies. Research Sponsor: U.S. National Institutes of Health, U.S. National Institutes of Health.

340 Poster Session (Board #N2), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Predicting radiation-induced immune trafficking and activation in localized prostate cancer.

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Background: Prostate cancer is frequently cured with high-dose rate brachytherapy as a front-line treatment. However, a significant number unfortunately develop intrinsic resistance. Although considered to be an immune-excluded tissue, immune responses are implicated in driving tumour-eradication in prostate cancer. This has not been proven, and yet is used as the rationale for numerous clinical trials combining radiation and immunotherapies. We hypothesise that there is a predictable but differential relationship between radiation and the immune responses in prostate cancer that could be used to fulfil a clinical need - identifying patients that would benefit from immune intervention in conjunction with radiation. **Methods:** We present here the results of comprehensive immunological profiling of a cohort of world-unique pre- and post-radiation tissues from 24 patients (RadBank cohort). These were assessed using pathological classification, tissue segmentation (cancer/surrounding stroma), multiplex IHC, gene expression profiling, T-cell receptor sequencing, and spatial computational analysis. **Results:** Our data resolved three classes of prostate cancer tissue based on immune infiltrate level, immune-activation and -checkpoint gene signatures, spatial clustering and T cell clone sequencing: We have begun to resolve clear patient and clinical classifiers based on immune responses to radiation, and identified patients groups likely to benefit from immune therapy alongside radiation. **Conclusions:** Importantly, these classifications are associated with baseline gene expression profiles that may be used for pre-clinical stratification and more sophisticated treatment paradigms. Research Sponsor: Prostate Cancer Foundation.

341 **Poster Session (Board #N3), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Periprostatic venous androgen levels in a subset of patients with prostate cancer: An investigation into a novel role of testosterone in localized prostate cancer.

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Background: While androgens drive prostate cancer (PCa), studies of systemic levels in eugonadal patients have not shown a relationship with development or progression of PCa. This study characterizes the relationship between systemic, local venous, and tissue androgen levels to understand the regulation and influence of androgens on localized PCa. **Methods:** Peripheral & periprostatic venous blood & prostate tissue were collected from patients undergoing radical prostatectomy (RP). Androgen levels (testosterone (T) and dihydrotestosterone (DHT)) were assessed by mass spectrometry. PCa grade and stage, PSA, prostate volume, and periprostatic vein diameter (PPVD) on MRI were recorded. A second cohort of patients undergoing just prostate MRI (non-surgical) was assessed to investigate the relationship between PPVD and disease severity. **Results:** Samples were collected from 176 patients. Analysis identified a subset of patients with elevated periprostatic T (ppT) relative to systemic T (sT) including 25% with ppT/sT $>$ 2, 14% with ppT/sT $>$ 4, and 7% with ppT/sT $>$ 10. Patients with ppT/sT $>$ 4 had supraphysiologic T levels in the periprostatic venous blood (mean 4223ng/mL). These patients also had higher than predicted levels of tissue T and DHT (tT/sT of 0.48 vs 0.24 (p = 0.004) and tDHT/sT of 7.31 vs 4.72 (p = 0.011)). In the surgical cohort, PPVD was increased in patients with elevated ppT/sT levels (5.8mm vs 3.7mm, p = 0.013). In the biopsy cohort (n = 200), increased PPVD was associated with an increased risk of diagnosis of PCa (4.39mm vs 3.43mm p = 0.006) and clinically significant PCa (4.35mm vs 3.43mm p = 0.01). **Conclusions:** In a subset of patients with PCa, periprostatic venous T levels were highly elevated compared to peripheral levels. Tissue T and DHT were also increased, and MRI demonstrated increased PPVD. We hypothesize that collateralization of venous drainage from the gonadal vein leads to both high local T and dilated veins. In a biopsy cohort, increased PPVD was associated with an increased risk of diagnosis of any and clinically significant PCa, suggesting that high periprostatic androgen levels may play a role in development of PCa. Research Sponsor: U.S. National Institutes of Health.

342 **Poster Session (Board #N4), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Multiple primary prostate tumors with differential drug sensitivity.

Scott C. Wilkinson, Huihui Ye, Nicholas Terrigino, Nicole Carrabba, Rayann Atway, Shana Y. Trostel, John Bright, S. Thomas Hennigan, Rosina Lis, Ross Lake, Stephanie Harmon, Baris Turkbey, Peter A. Pinto, Peter L. Choyke, Fatima Karzai, David James VanderWeele, Kathleen Kelly, William L. Dahut, Adam G. Sowalsky; National Cancer Institute, Bethesda, MD; University of California Los Angeles, Los Angeles, CA; National Cancer Institute, BETHESDA, MD; University of Texas Medical School at Houston, Houston, TX; National Institutes of Health, Bethesda, MD; Dana-Farber Cancer Institute, Boston, MA; Clinical Research Directorate, Frederick National Laboratory for Cancer Research sponsored by the National Cancer Institute Frederick, Frederick, MD; Molecular Imaging Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; National Cancer Institute at the National Institutes of Health, Bethesda, MD; University of Chicago Medical Center, Chicago, IL

Background: The differential aggressiveness of potentially independent prostate cancer clones remains largely unknown. Appropriate prostate cancer staging using mpMRI and biopsy tissue can be confounded by sampling error. To date, there has been no understanding of whether clonal variability influences management decisions for localized prostate tumors. We sought to identify the sensitivity and genomic profile of distinct localized tumors from a patient following systemic intense neoadjuvant androgen deprivation therapy (ADT). **Methods:** A 66-year-old man with high risk prostate cancer enrolled in a Phase 2 study of intense neoadjuvant ADT (goserelin + enzalutamide; inADT). Baseline mpMRI showed a single semi-contiguous lesion encompassing the right apical-mid PZ extending into the left distal apical PZ. MR/US-fusion targeted biopsy was performed before 6 months of inADT. A second mpMRI was performed before radical prostatectomy. Whole exome sequencing on microdissected tumor foci identified somatic mutations and copy number alterations, which were further used with immunohistochemistry to assess tumor clonal architecture and genomic/phenotypic evolution of treatment resistant tumor. **Results:** We found two clonally independent tumors exhibited intrinsic heterogeneity at baseline which correlated with response or resistance. Biopsies of distinct left- and right-sided tumors showed differing histologies. mpMRI and pathology showed near complete response of the left-sided tumor and substantial resistance of the right-sided tumor, which exhibited a large intraductal component. Histology and whole exome data highlighted a divergence in the status of PTEN and TP53, tumor suppressor genes implicated in prostate cancer progression. **Conclusions:** These data highlight that even nascent prostate cancer is heterogenous and neoadjuvant therapeutic strategies will need to consider this for clinical optimization. Evolutionary trajectories that resulted in tumor heterogeneity in this case likely contributed to our observation that two independent prostate tumor nodules with distinct genetic alterations responded differently to neoadjuvant intense ADT. Clinical trial information: NCT02430480. Research Sponsor: U.S. National Institutes of Health.

343 **Poster Session (Board #N5), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Predicting biochemical recurrence after prostatectomy: Can machine learning beat CAPRA score? Results of a multicentric retrospective analysis on 4,700 patients.

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Background: Recent advances in machine learning algorithms and deep learning solutions paved the way for improved accuracy in survival analysis. We aim to investigate the accuracy of conventional machine learning and deep learning methods in the prediction of 3-year biochemical recurrence (BCR) as compared to CAPRA score prediction. **Methods:** A total of 5043 men who underwent RP between 2000 and 2015 for clinically localized PCa iwere analyzed retrospectively. Three-year BCR was predicted using the following models: CAPRA score, Cox regression analysis, logistic regression, k-nearest neighbor, random forest and densely connected feed-forward neural network classifier. The discrimination of the models was quantified using the C-index or the area under the receiver operating characteristics curve. **Results:** Patients with CAPRA score 2 and 3 accounted for 64% of the population. C-index measuring performance for the prediction of the three-year BCR for CAPRA score was 0.63. C-index values for k-neighbor classifier, logistic regression, Cox regression analysis, random forest classifier and densely optimized neural network were respectively 0.55, 0.63, 0.64, 0.64 and 0.70 (pairwise, adjusted p-value $<$ 0.01). After inclusion of available post-surgical variables, C-index value reached respectively 0.58, 0.77, 0.74, 0.75 and 0.84 (pairwise, adjusted p-value $<$ 0.05). **Conclusions:** Our results show that CAPRA score performed poorly in intermediate-risk patients undergoing RP. Densely connected neural networks with simple architecture further increased predictive power with low computational cost. In order to predict 3-years BCR, adding post-surgical features to the model greatly enhanced its performance. Research Sponsor: None.

344 Poster Session (Board #N6), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Immunosuppressive milieu of high-risk localized prostate cancer.

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Background: The immune factors that modulate the aggressiveness of localized treatment-naïve prostate cancer remain poorly understood. **Methods:** Fresh tumor and peripheral blood were collected at the time of radical prostatectomy in patients with localized prostate cancer. We evaluated the immune cell composition of 22 patient samples employing multi-parametric flow cytometry. Samples were grouped by histological grade into intermediate (INTPCA) and high-grade (HIGHPCA) prostate cancers based on standard NCCN criteria and immune cell abundances were quantified by mean +/- SEM. Statistical significance was assessed using the Mann-Whitney test. **Results:** INTPCA and HIGHPCA tumors harbored a similar increase in CD8+ T cells ($p < 0.0005$ and $p < 0.05$, respectively) and CD11b+CD68-CD16+ myeloid-derived cells ($p < 0.05$) relative to the peripheral blood. Other cell types were similarly decreased in both INTPCA and HIGHPCA, including CD11b+CD68+CD14+ ($p < 0.005$ and $p < 0.05$, respectively). By contrast, regulatory T cells were the only cell type in our analysis to be uniquely enriched in HIGHPCA rather than INTPCA ($p < 0.05$). The most unique feature found in phenotypic profiling of the immune repertoire of HIGHPCA relative to INTPCA was an increase in the immune inhibitory receptor ligand, PD-L1, in the tumor associated macrophages (CD11b+CD68+CD14+) compared to the periphery ($p < 0.05$). **Conclusions:** Collectively, our findings reveal that HIGHPCA harbors a distinct immunological landscape. Although effector CD8+ T cells are preferentially expressed in the tumor, these are met with an increased proportion of regulatory T cells as well as PD-L1 expressing macrophages that contribute to the inert tumor microenvironment. These are key features of aggressive prostate cancer that may serve as potential biomarkers and therapeutic targets. Research Sponsor: U.S. National Institutes of Health.

345 **Poster Session (Board #N7), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Trends and oncological outcome of testosterone recovery after androgen deprivation therapy in prostate cancer patients who received external beam radiotherapy.

Akinori Takei, Shinichi Sakamoto, Takaaki Tamura, Ken Wakai, Maihulan Maimaiti, Yusuke Imamura, Akira Komiya, Hiroomi Nakatsu, Koichiro Akakura, Tomohiko Ichikawa; Chiba University, Chiba, Japan; Chiba University Graduate School of Medicine, Chiba-Shi, Japan; Yokohama Rosai Hospital, Yokohama, Japan; Chiba University Graduate School of Medicine, Chiba, Japan; Chiba university Graduate School of Medicine, Chiba City, Japan; Asahi General Hospital, Asahi, Japan; Department of Urology, JCHO Tokyo Medical Center, Tokyo, Japan; Department of Urology, Graduate School of Medicine, Chiba University, Chiba, Japan

Background: Although androgen deprivation therapy (ADT) combined with external beam radiation therapy (EBRT) is standard treatment for high risk prostate cancer (PC) patients, the shift of testosterone (TST) levels after ADT and the optimal duration of ADT is unclear. TST recovery and outcome were studied in PC patients who received EBRT with ADT. **Methods:** Eighty-two patients who underwent EBRT with ADT for PC were retrospectively analyzed. Serum TST levels after ADT terminations were studied. Cox proportional hazard models and the Kaplan-Meier method were used for statistical analysis. **Results:** Median age, baseline TST, nadir TST, and duration of ADT were 73 years, 456 ng/dL, 16 ng/dL, and 26 months, respectively. ADT duration of 33 months (HR 0.13; p=0.0018), nadir TST of 20 ng/dL (HR 0.35; p=0.0112), and TST >50 ng/dL at 6 months after ADT termination (HR 0.21; p=0.0075) were significantly associated with TST recovery to normal levels (200 ng/dL) on multivariate analysis. ADT duration of 33 months (HR 0.31; p=0.0023) and nadir TST of 20 ng/dL (HR 0.38; p=0.0012) were significantly associated with TST recovery to supracastrate level (50 ng/dL) on multivariate analysis. In high risk PC patients, ADT≤ 2 year group showed shorter time to TST recovery to supracastrate levels compare to those of ADT>2 year group (HR 4.21; p=0.0022) without affecting biochemical recurrence (p=0.49) and overall survival (p=0.674). **Conclusions:** ADT duration of 33 months and nadir TST of 20 ng/dL predicted the TST recovery to suparacastrate levels. Less than 2 year of ADT provided better TST recovery without affecting the oncological outcome in high risk patients. Research Sponsor: None.

TST recovery to normal level (200 ng/dL) after termination of ADT on cox proportional hazard analysis.

	Univariate		Multivariate	
	HR(95% CI)	P	HR(95% CI)	P
ADT total duration≥ 33 months	0.16(0.05-0.35)	<0.0001	0.13(0.02-0.50)	0.0018
TST≤ 50 ng/dL (6moths post ADT)	0.18(0.08-0.36)	<0.0001	0.21(0.06-0.67)	0.0075
Nadir TST ≤ 20 ng/dL	0.22(0.11-0.43)	<0.0001	0.35(0.14-0.79)	0.0112
Age at ADT off> 70 years	0.42(0.23-0.76)	0.0048	0.60(0.22-1.57)	0.3012
Initial PSA> 36.16 ng/ml	0.47(0.21-0.99)	0.0471	0.75(0.21-2.24)	0.6271

346 Poster Session (Board #N8), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Ability of the combined clinical cell-cycle risk score to identify patients that benefit from multi versus single modality therapy in NCCN intermediate and high-risk prostate cancer.

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Background: Prolaris combines RNA expression analysis of cell cycle progression genes with clinicopathologic information to create a combined clinical cell-cycle risk score (CCR). We evaluated the ability of CCR to predict metastasis (mets) in men for whom guidelines indicate that multimodality therapy (MTx) should be considered. **Methods:** A commercial cohort (N=15669) of National Comprehensive Cancer Network unfavorable intermediate-risk (UFI) and high-risk (HR) men revealed a distribution of 70.5% and 29.5% respectively. A CCR threshold of 2.112 was selected so that 29.5% of these men were above the threshold. MTx was defined as combined use of androgen deprivation therapy with radiation (RT) or surgery, or with adjuvant RT. Associations were evaluated in a 718-person retrospective, multi-institutional database of Prolaris-tested UFI and HR men. Kaplan-Meier (KM) analyses and Cox regressions were used to estimate the effects of prognostic covariates. **Results:** Median follow-up was 5.13 years. CCR predicted mets in the full cohort (HR =3.8 [2.7,5.2], $p<10^{-15}$) and after accounting for CAPRA (HR=4.3 [2.7,7.0], $p< 10^{-7}$). CCR also was a significant predictor of mets in patients who received STx, as a continuous predictor (HR=4.0 [2.6,6.1], $p<10^{-9}$) and when dichotomized at the threshold (HR=15.9 [5.4,46.5], $p< 10^{-9}$). The KM probability of mets by 10 years for those below and above the threshold was 4.3% and 20.4% respectively. MTx reduced patients' risk of mets (HR=0.46 [0.22,0.97], p=0.04), and treatment benefit can be evaluated as a function of CCR score (Table). **Conclusions:** The CCR score prognosticates a clinically meaningful different risk of metastasis for those receiving MTx versus STx. Approximately 27% and 73% of people with HR or UFI risk cancer have CCR scores below the risk threshold and may consider STx after considering the difference in risk of mets. Research Sponsor: Myriad Genetics, Inc.

CCR	STx Risk	MTx Risk	Risk Reduction for MTx
0	0.4% (0.1%, 1.2%)	0.2% (0.04%, 0.7%)	-0.2%
1	1.6% (0.7%, 3.8%)	0.7% (0.2%, 2.4%)	-0.9%
2	6.8% (3.6%, 12.9%)	3.2% (1.3%, 7.9%)	-3.6%
3	26.9% (15.5%, 43.9%)	13.5% (6.6%, 26.5%)	-13.4%
4	74.9% (47.5%, 94.8%)	47.4% (26.4%, 73.8%)	-27.5%

347 **Poster Session (Board #N9), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Fraction genome altered (FGA) to regulate both cell autonomous and non-cell autonomous functions in prostate cancer and its effect on prostate cancer aggressiveness.

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Background: Our ability to distinguish lethal from non-lethal forms of prostate cancer (PC) is limited**.** Given prostate tumors' genetic heterogeneity, is it unlikely that a single somatic variant is prognostic. Herein we investigated fraction of genome altered (FGA; percentage of copy number altered chromosome regions out of measured regions; cBioportal) and tumor mutational count (TMC; number of mutational events per case) harbored by the primary tumor as two tumor-specific factors posited to influence disease aggressiveness or responsiveness to certain therapeutic agents. **Methods:** We used the TCGA data (n= 490 primary PC) and MSKCC-IMPACT (n=717, Zehir et al 2017) PC datasets to analyze the correlation between FGA and TMC in PC. GSEA was performed with transcriptomes used to identify signaling pathways associated with these two measures. We then categorized 490 primary PC patients from TCGA dataset into 4 groups based on FGA and TMC levels (based on the median values) to assess associations with outcomes. **Results:** Primary PC patients who harbor $FGA^{high}TMC^{low}$ exhibited shorter disease-free survival (High Risk). We observed attenuation of the androgen signaling pathway and induction of cell proliferation pathways associated with this aggressive form of disease. We used results from CIBERSORT algorithm and deep learning methods of TCGA data and observed that quantities of tumor infiltrating lymphocytes was higher in the $FGA^{high}TMC^{low}$ group (p=0.038). However, we also observed significantly reduced immune effector signaling-pathway signaling in this high-risk $FGA^{high}TMC^{low}$ group suggesting the presence of immune-suppressive networks in primary disease associated with a high risk of progression. **Conclusions:** A greater understanding of molecular features of aggressive primary PC (FGA/TMC) will be important in developing management strategies. Based on our preliminary analyses, we hypothesize that patients whose primary PC harbors $FGA^{high}TMC^{low}$ have a higher likelihood of aggressive disease due to their impact on PC cell proliferation and dedifferentiation (cell autonomous), and subdued immune responses (non-cell-autonomous). Research Sponsor: U.S. National Institutes of Health.

348 **Poster Session (Board #N10), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Head-to-head comparison between decipher and prolaris tests: Two commercially available post-prostatectomy genomic tests.

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Background: Several post-prostatectomy genomic tests are available; which are used to improve prognostication and to guide additional treatment after radical prostatectomy (RP). There has been no head to head comparison between these tests. The objective of this study is to compare the performance of two genomic tests in predicting oncological outcomes. **Methods:** 16 patients who underwent RP at the University of Pennsylvania (UPenn) (2013-2018), had adverse pathology (margin, and/or pT3a/b) and had each been tested with both Decipher (D) and Prolaris (P). Pearson correlation was used to compare scores from D and P as well as CCP scores and microarray derived CCP (mCCP). The associations of D and P with biochemical recurrence (BCR) and metastasis (M) was evaluated in survival analysis in a large cohort of RP patients treated at Johns Hopkins University (1992-2010) (JHU). **Results:** The median follow-up of the UPenn cohort was 24 months. 6 patients developed BCR and two distant M. There was a significant correlation between the D and P score (r=0.67,p=0.004), and between the 10-year BCR risk reported by P and the 5-year M risk reported by D (r=0.69, p=0.003). Each test called 7 patients to be high risk; 5 were in common. Both tests correctly called the 2 M cases as high risk and 4/6 BCR patients to be high risk. A microarray-derived CCP (mCCP) was highly correlated to the CCP scores reported from P (r=0.88, p=6.7e-6) in the UPenn cohort. To compare the prognostic performance of mCCP to D for predicting BCR and M, we used Post-RP cohort from JHU (N=355). Both scores were correlated (r=0.36, p2e-12). D and mCCP were stratified into 5 groups of incremental 20%. When including mCCP groups, D groups, Gleason score, SVI, EPE, LNI, and PSA; D remained independent prognostic variable of BCR (HR 1.16, 95%CI [1.05-1.3], p=0.005) and M (HR 1.3, 95%CI [1.12-1.52], p=0.0005). However, mCCP was not prognostic of BCR (p=0.59) nor M (p=0.62). **Conclusions:** The findings from this study show that P and D scores post-RP were highly correlated and help in identifying patients who at high risk of progression in this small cohort with short follow up. However, D outperformed mCCP for predicting BCR and M in larger cohorts with longer follow up. Research Sponsor: None.

349 **Poster Session (Board #N11), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Tumor cell intrinsic androgen biosynthesis by 3β-hydroxy steroid dehydrogenase (HSD3B1) to modulate radiosensitivity in prostate cancer cells.

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Background: Resistance to ADT is associated with a gain of function mutation in the 3β-HSD enzyme, which catalyzes extragonadal/intratumoral DHT synthesis. As androgen signaling is known to upregulate the DNA damage response (DDR), we investigated whether HSD3B1 genotype modulates DDR and radiosensitivity in PCa. **Methods:** We stably knocked down HSD3B1 in LNCaP, C42 and VCaP cell lines (which carry the protein stabilizing variant allele) and overexpressed the variant HSD3B1 allele in LAPC4 (harbors a WT allele which readily undergoes degradation). We examined the proliferative and clonogenic capacity of these cells in presence and absence of substrate, DHEA, followed by treatment with IR (400-800 cGy, single fraction). We studied DNA DSB formation and resolution kinetics using γH2AX foci formation in response to radiation. We also measured changes in mRNA expression of DDR response genes pre- and post-radiation. **Results:** Control shRNA transduced cell lines had increased cell proliferation ($p<0.001$) and clonogenic survival (2 logs at 800cGy single fraction radiation, $p<0.001$) in the presence of DHEA compared to HSD3B1 knockdown cells. Variant HSD3B1 cell lines were more radioresistant and exhibited more efficient γH2AX foci resolution at 24 hrs ($p<0.05$) in a DHEA dependent manner. We observe increased mRNA expression of DDR genes from specific repair networks including non-homologous end joining (PRKDC, XRCC4, XRCC5) and homologous recombination (RAD51, RAD54) in variant HSD3B1 cells. Transcriptional induction of DDR genes following radiation in presence of DHEA was significantly more pronounced in HSD3B1 variant cells, suggesting a more permissive chromatin context. **Conclusions:** Increased intracellular 3β-HSD drives transcription of NHEJ and HR genes, more rapid resolution of γH2AX foci, and radioresistance in prostate cancer. This work has therapeutic implications related to strategies for combined radiation and androgen directed therapy in localized and metastatic prostate cancer. Prospective validation of treatment strategies combining blockade of adrenal steroid precursor synthesis, ADT, and XRT in high risk disease is warranted. Research Sponsor: DoD Award Number W81XWH-18-1-0177.

350 **Poster Session (Board #N12), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Outcomes of men with ductal prostate cancer undergoing definitive therapy for localized disease.

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Background: Ductal prostate adenocarcinoma (DAC) is an aggressive variant of prostate cancer (PC). We aimed to assess the outcomes of men with localized DAC undergoing radical prostatectomy (RP) or external beam radiotherapy (RTx) compared to acinar adenocarcinoma of the prostate (PAC) and investigate any difference between these treatment modalities. **Methods:** All patients presenting to our institution with localized DAC from January 2005 - November 2018 were compared to a pooled cohort of patients from 3 tertiary referral centers who underwent RP for Gleason 8 PC and a cohort of high risk PC patients who underwent RTx for PAC. Patient, tumor characteristics and outcome data were analyzed. **Results:** 257 men with DAC were identified and compared to 803 with PAC. 203 men with DAC and 729 men with PAC underwent RP while 54 men with DAC and 74 men with PAC underwent RTx. Men with DAC were older (65 vs 63 years and 70.5 vs 66 years) and had higher cT3/T4 stage (43% vs 2.8% and 44.5% vs 31.1%) in both groups, respectively (all $p < 0.05$). The median follow-up for men undergoing RP was 34 (range 0.9 to 177) months and 73.4 (range 0.6 – 224.2) months for men having RTx. Presence of DAC was an independent risk factor for metastases (HR 2.5 (95% CI 1.4- 4.8); $p<0.01$) and death (HR 2.3 (95% CI 1.1 – 4.7); p=0.02) following RP. The 3- year overall survival (OS) rates for DAC and PAC in men undergoing RP were 93.3% vs 99.3% ($p<0.01$). On adjusting for Gleason score, clinical T stage, PSA and age, DAC was also an independent risk factor for death (HR 6.1 (95% CI 1.7-22.2); $p<0.01$) in men undergoing RTx with 5-year OS rates of 100% and 81.6% for DAC and PAC, respectively. There was no difference in the OS of men with DAC between RP and RTx. **Conclusions:** Men undergoing RP or RTx for localized DAC had worse outcomes compared to PAC, but no survival difference was seen between these treatment modalities. DAC behaves clinically differently than PAC. Further evaluation of the underlying biology and potential for specific targeted multimodality therapies in DAC is needed. Research Sponsor: None.

351 **Poster Session (Board #N13), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Racial/ethnicity differences when endorsing influential factors for prostate cancer treatment choice: An analysis of data from the personal patient profile-prostate (P3P) I and II trials.

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Background: Race and ethnicity impact the type of treatment received for localized prostate cancer in American men. We hypothesized that there may be differences in men's influential values and preferences related to treatment decisions. **Methods:** We analyzed samples from two multicenter, randomized trials of the Patient Profile-Prostate (P3P) decision aid, first comparing the trial groups on demographic and decisional variables using Chi-square tests. Stratified (P3P I vs II) logistic regression was then used to assess the univariate association between race/ethnicity and endorsement of moderate-or-strong influence of 14 lifestyle factors, current or future symptoms, or important others on the decision. A multivariable stratified logistic regression with backward variable selection was used to further estimate the association between influential factors and race/ethnicity. **Results:** Data from 494 and 392 participants in P3PI and P3PII, respectively, were analyzed for 40 Hispanic, 168 non-Hispanic black, 637 non-Hispanic white, 19 others and 6 missing. Age (p=.0001), education (p<.0001), marital status (p<.0001), income (p<.0001), Internet use for information (p<.0001) and decisional control preference were significantly different across racial/ethnic groups. In adjusted analyses, racial/ethnic differences existed for influence of age (Non Hispanic Black (NHB) vs. Non Hispanic White (NHW) OR: 0.56 95%CI 0.38-0.85p=.002), religion/spirituality (NHB vs. NHW OR: 3.2095%CI1.95-5.26, p<.0001), future bladder function (NHB vs. NHW OR: 0.5795%CI0.35-0.90, p=.04), future ability to engage in recreation (NHB vs. NHW OR: 0.5495%CI 0.34-0.86, p=0.02), and a story of a famous person with prostate cancer (NHB vs. NHW OR: 2,11 95%CI1.30-3.43, p=.007). **Conclusions:** Our results suggest racial/ethnic differences for influences underlying treatment choice. Better understanding these influences may help us present salient information about treatment options to patients and address disparities. Research Sponsor: U.S. National Institutes of Health.

352 Poster Session (Board #N14), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM

Assessing focality of dominant tumor on serial biopsy in an active surveillance cohort: Implications for focal therapy.

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Background: Focal therapy (FT) has been proposed as an alternative to active surveillance (AS) for men with low/intermediate risk prostate cancer (PCa). We aim to understand progression within and outside the dominant tumor (DT) in terms of changes in focality, tumor volume and histologic grading on serial biopsy of the prostate (Bx) to identify reasonable candidates for FT. **Methods:** Men enrolled on AS at UCSF between 1996 and 2017 with low\intermediate risk PCa at diagnosis (PSA $<$ 20ng\ml, stage cT1\2, Gleason score (GS) $\leq$3+4) and at least 1 Bx after diagnosis were included. All Bx were systematic. Changes in Bx laterality and/or grade were assessed over time. DT was defined as the tumor with highest GS and size on Bx confined to 1 or 2 contiguous sextants. Those with unifocal disease (Un), multifocal in contiguous sextants (Mc), or a small volume of GS 3+3 on the contralateral side were considered candidates for FT. **Results:** Among 1272 men, mean age was 62 years, median PSA was 5.42 ng\ml and median follow up was 78 months (IQR 46-108). Median number of Bx was 3 (min 2, max 12) and 18% had $>$5 Bx. At diagnosis 90% and 10% of patients had GS 3+3 and 3+4 disease respectively. At first surveillance Bx (fsBX) findings were negative in 20%, unchanged in 56% and upgraded in 24%. Findings were similar at the following 3 Bx. Across all biopsies 27% were negative and 7-year upgrade-free survival was 39%. At diagnosis, 88% of tumors were in locations viable for FT (50% Un and 38% Mc versus 12% multifocal in non-contiguous sextants (Mn-c)). At fsBX, 21% of Bx were negative and 85% of the remainder were viable for FT (29% Un and 56% Mc versus 15% Mn-c). Across all Bx DT remained stable in 592 (47%), changed prostate side or expanded to bilateral in 128 (10%), upgraded on the original dominant side in 407 (32%), and upgraded on the opposite side in 145 (11%). Of those upgraded on the non-dominant side, 74% were GS 3+4, 21% were GS 4+3 and 5% were GS $\geq$4+4. **Conclusions:** On serial biopsy, tumor location remains relatively stable and significant changes in grade and/or volume occur in the DT. A low percentage of patients show significant progression outside the DT. Such information is relevant when considering FT in this patient population. Research Sponsor: None.

353 Poster Session (Board #C5), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Early diagnosis of prostate cancer, AABH (Aspartyl Asparaginyl β-hydroxylase), a predictive biomarker: A serum immunoassay and personalized medicine.

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Background: Prostate Cancer (PC) is the most common form of cancer in men in the United States. In their lifetime, approximately 1 out of every 6 American men will develop PC. The chances of developing PC increase dramatically after age 50 with more than 70% of cases occurring in individuals over 65 years of age. **Methods:** We have investigated the use of aspartyl (asparaginyl) β-hydroxylase (AABH) as a cancer biomarker. We have developed a sandwich ELISA for its detection. Here this assay was utilized to screen sera from patients with prostate cancer and PSA values in various ranges. **Results:** AABH levels were assessed in sera from 263 individuals with PC and 73 men over 50 years of age not known to have cancer. The levels of AABH in the two groups were >3.00 ng/ml and <3.00 ng/ml, respectively. The overall sensitivity and specificity of the test were 97.5% and 96%. AABH and PSA levels were also compared. The AABH values and sensitivities in individuals with PC and PSA values in the ranges <2 ng/ml, 2-4 ng/ml and >4 ng/ml were >3.00 ng/ml, 99% (n=115); > 3.00 ng/ml, 98% (n=64) and >3.00 ng/ml, 95% (n=114). **Conclusions:** The present study of AABH indicates that cancer group can be clearly distinguished from normal healthy controls. Moreover, the study indicates that AABH might be used to identify disease in individuals with questionable PSA values. These results support to the establishment of routine screening of serum AABH as a means to detect those who need referral for prostate biopsy. The use of AABH testing may enhance current prostate cancer screening practices by both identifying individuals with low but suspicious PSA values who should be recommended for biopsy and reducing the number of false positive biopsies indicated by positive PSA tests. Serum AABH levels are significantly elevated in individuals with prostate cancer. Using a cutoff value of 3ng/ml, overall sensitivity of the assay for prostate cancer is 97%. The test has a specificity of 96% in healthy men over 50 years of age. AABH is elevated in prostate cancer tissue but NOT in normal prostate or in Benign Prostatic Hyperplasia (BPH). Serum AABH levels are NOT correlate with PSA levels. Research Sponsor: Next Pharma Inc.

354 **Poster Session (Board #C6), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Concordance between MRI fusion versus TRUS prostate biopsy and final pathology at radical prostatectomy: Data from the PURC.

Ruchika Talwar, Katharine Michel, Aseem Malhotra, Claudette Fonshell, John Danella, Serge Ginzburg, Thomas Lanchoney, Jay D. Raman, Adam Reese, Jeffrey Tomaszewski, Edouard John Trabulsi, Marc C. Smaldone, Robert Guy Uzzo, Daniel Lee, Thomas J. Guzzo; University of Pennsylvania, Philadelphia, PA; The Health Care Improvement Foundation, Philadelphia, PA; Geisinger Medical Center, Danville, PA; Albert Einstein Med Ctr, Rydal, PA; Urology Health Specialists, LLC, Bryn Mawr, PA; Pennsylvania State University College of Medicine, Hershey, PA; Temple Univ School of Medcn, Philadelphia, PA; MD Anderson at Cooper University Hospital, Camden, NJ; Department of Urology, Sidney Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA; Fox Chase Cancer Center, Philadelphia, PA; Fox Chase Cancer Center – Temple University Health System, Philadelphia, PA

Background: Studies suggest that MRI-fusion guided biopsies are superior to the transrectal ultrasound guided (TRUS) technique. Herein, we present the Pennsylvania Urologic Regional Collaborative (PURC) experience with MRI fusion biopsy. We aimed to calculate concordance rates between TRUS prostate needle biopsy versus MRI fusion biopsy and final pathology at the time of radical prostatectomy within our cohort. **Methods:** Within PURC, a prospective quality improvement collaborative of urology practices in Pennsylvania and New Jersey, we identified all men who underwent a TRUS or MRI fusion prostate needle biopsy followed by radical prostatectomy for the treatment of prostate cancer from 2015 to 2018. We analyzed International Society of Urological Pathology Grade Group (GG) scoring and calculated the concordance and upgrading rates at the time of biopsy versus final pathology at radical prostatectomy. To assess for differences between our rates, we performed a test of equal proportions and Pearson's chi-squared test (significance = $p<0.05$). **Results:** We identified 1,437 men who underwent TRUS (n=1247) or MRI Fusion (n=196) biopsies followed by radical prostatectomy. Overall pathologic grading distribution at time of biopsy was: 35.8% (n=515) Grade Group (GG) 1, 28.5% (n=409) GG 2, 13.3% (n=191) GG 3, 11.5% (n=165) GG 4, and 10.9% (n=157) GG 5. Median number of cores at TRUS biopsy was 12 (IQR: 12,13). Median number of cores at MRI Fusion biopsy was 15 (IQR 13,18). Therefore, we inferred patients who underwent MRI Fusion biopsy also underwent standard TRUS biopsies at that time. On average, exact concordance rate between MRI Fusion biopsy and final pathology was 9.1% higher than concordance rate of TRUS biopsy (44.4% vs 35.3%, 95% CI: 1.6%-16.5%, $p < 0.01$). The overall rate of upgrading on final pathology for MRI fusion biopsies was 5.7% lower than for TRUS biopsies, but this was not statistically significant (35.2% vs 40.9%, 95% CI: 1.5-13.0%, p=0.06). **Conclusions:** MRI fusion biopsies demonstrated higher concordance rates with final pathology at the time of radical prostatectomy than TRUS prostate biopsies alone. Research Sponsor: Healthcare Improvement Foundation.

355 Poster Session (Board #C7), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Transperineal prostate biopsies without antibiotic prophylaxis: Safety evaluation of the first 65 patients.

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Background: There is an ongoing trend towards perineal prostate biopsies for the detection of prostate cancer. For many reasons the issue of antibiotic prophylaxis in prostate biopsies is becoming more important, especially with quinolone antibiotics being excluded from this indication and an increasing antibiotic resistance. Considering that the perineal biopsy is a sterile procedure, not giving antibiotics for prophylaxis seems to be an alluring approach. **Methods:** At the General Hospital Leverkusen, transperineal (TP) MRI TRUS fusion biopsies are performed using the Ginsburg Protocol with a template and software-guided approach in general anesthesia. Patients received single dose antibiotics (Ciprofloxacine 500 mg) two hours prior to surgery from Jan 2019 to Aug 2019 (group 1). Starting in Sep 2019, no antibiotics were used for prophylaxis (group 2). Surgical disinfection using Povidone-iodine was performed ahead of every procedure. In this study, postoperative infection rates were assessed. Patients were followed up by telephone interview at least two weeks after biopsy and were asked about the need for postoperative antibiotics to treat regular UTI, fever, prostatitis or for readmission to other hospitals. **Results:** A total of 180 TP biopsies were performed with a median of 22 cores (min 18, max 28). Out of 115 cases with antibiotic prophylaxis, no patient was readmitted to the hospital due to infection or fever. Group 2 included 65 patients. No one was readmitted with fever or prostatitis. At the time of abstract admission 45 out of 65 patients in this group were followed up by telephone interview. None needed antibiotics and none was readmitted to a hospital elsewhere. **Conclusions:** The study shows an infection rate of 0 % for perineal prostate biopsies with or without antibiotic prophylaxis. The results argue in favor of perineal prostate biopsies and challenge the dogma of prostate biopsies needing an antibiotic prophylaxis irrespective of the approach. However, a larger prospective multicenter study should be initiated to ensure patient safety. Research Sponsor: None.

356 **Poster Session (Board #C8), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Natural history of an immediately detectable PSA following radical prostatectomy: A description of a contemporary cohort.

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Background: Radical prostatectomy (RP) can provide good long-term oncological outcomes in patients with localized and locally advanced prostate cancer (PCa). After RP, prostate specific antigen (PSA) represents the corner stone for follow-up of patients. A persistently detectable PSA immediately following RP is an unfavourable prognostic factor. We described the natural history of the management and outcomes in men with a detectable PSA in an academic cohort. **Methods:** A retrospective review of prospectively collected clinical and pathologic data from consecutive patients who underwent RP for non-metastatic PCa between 2000 and 2018 was performed. A *detectable PSA* was defined as PSA $\geq$ 0.05 ng/ml between 2-6 months post-surgery. *Biochemical recurrence* (BCR) was defined as two consecutive PSA values $\geq$ 0.2 ng/ml after 6 months post-surgery or any salvage treatment for a rising PSA. Second recurrence was defined as additional treatment after post-RP salvage treatment. Outcomes were defined as time to other cause mortality (OCM) or prostate cancer specific mortality (PCSM). **Results:** We identified 499 men with a *detectable PSA* within 6 months following RP. Median PSA at diagnosis was 7.95 ng/ml (IQR 5.57-12.97). Median CAPRA-S score was 5 (IQR 2-7). Median follow-up was 41 months (IQR 20-77). 296 (59%) underwent salvage treatment for a rising PSA at a median of 5 months. 33 (23%) of these men required further treatment (10 for bone metastases) at a median of 7 months. 203 (41%) of men with an immediately detectable PSA did not undergo any further treatment after RP. Treatment-free survival after post-RP salvage (31 on ADT and 2 underwent salvage RT) in men with a detectable vs undetectable PSA was 86% vs 92% at 1 year, 78% vs 89% at 3 years, 72% vs 86% at 5 years and 70% vs 76% at 10 years (Log-rank p =0.02). Prostate cancer specific survival in men with a detectable vs undetectable PSA was 100% vs 100% at 1 year, 99% vs 100% at 3 years, 96% vs 100% at 5 years and 91% vs 99% at 10 years (Log-rank p $<$ 0.01). **Conclusions:** This report describes the natural history of the management and outcomes in men with a detectable PSA following RP. We demonstrate that men with a detectable PSA after RP may have excellent long-term outcomes. Research Sponsor: None.

357 Poster Session (Board #C9), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Influence of caseload on survival of patients (pts) with localized prostate cancer (PC) after definitive radiation therapy (DRT).

Sarmad Sadeghi, Primo Lara, Denice D. Tsao-Wei, Monish Aron, Jacek K. Pinski, David I. Quinn, Inderbir Gill, Afsaneh Barzi; University of Southern California Norris Comprehensive Cancer Center, Los Angeles, CA; University of California, Davis, Sacramento, CA; USC Keck School of Medicine Norris Comprehensive Cancer Center, Los Angeles, CA; USC Norris Comprehensive Cancer Center, Los Angeles, CA; USC Institute of Urology, Los Angeles, CA

Background: We recently reported a significant all-cause mortality risk reduction associated with higher annual caseload for radical prostatectomy (RP)- (PMID 31398279). Here we explore this relationship in DRT. **Methods:** National Cancer Database (NCDB) was used to investigate outcomes of DRT in the United States. Beam radiation (BR), radioactive implant (RI) and both (BRRI) were included in analysis. Using overall survival (OS) as primary outcome, the relationship between facility annual caseload (FAC) for all PC pts and facility annual caseload (FARC) for those requiring DRT were examined using Cox model. Four volume groups (VG) were defined as VG1: <50th, VG2: 50th-74th, VG3: 75th-89th and VG4: top 10 percentile of caseload. **Results:** Between 2004 and 2014, 355,247 pts underwent DRT. At a median follow up of 70.1 (95% CI: 1.0 - 143.1) months (mo), the median OS was 137.3 mo (136.9, 138.1). Using FAC/FARC, 19/14, 27/24, 24/26, and 30/37 % of pts were treated at VG 1 through 4, respectively. For FARC, median OS was 136.8 mo (134.9, 142.2+) for VG1 and 139.7 (137.7, 141.8+) mo for VG4, adjusted hazard ratio (aHR) 1.06 (1.03-1.09), p <0.001. For FAC, median OS was 135.4 (134.1, 138.7) mo for VG1 and not reached for VG4, aHR 1.13 (1.09, 1.16), p <0.001. In subgroups, FARC aHR for VG1 vs VG4 were 1.20 (1.16-1.25) for BR, 0.99 (0.93-1.05) for RI, and 1.15 (1.02-1.31) for BRRI. These numbers for FAC were 1.10 (1.06, 1.14), 1.12 (1.05, 1.19), and 1.24 (1.12, 1.39), respectively. **Conclusions:** There is a statistically significant OS advantage to DRT at a high annual caseload facility. This effect is more pronounced for BR and is influenced more noticeably by facility all PC caseload rather than DRT. Research Sponsor: None.

		#	%
Age			
Median (Range) (Q1, Q3)		68 (25 - 90) (63, 74)	
Insurance			
	None	4574	1
	Private	124359	35
	Medicaid	7800	2
	Medicare	204892	58
	Other	7787	2
	Unknown	5835	2
Charlson Deyo Comorbidity			
	0	309348	87
	1	38866	11
	2	7033	2
Facility Program			
	Community	38694	11
	Comprehensive Community	178068	50
	Academic	103424	29
	Integrated Network	35025	10
	Unknown	36	<1
Clinical Risk			
	Low	31721	9
	Intermediate	128991	36
	High	34841	10
	Vary High	28	<1
	Unknown	159666	45
Hormone			
	No	208012	59
	Yes	135580	38
	Unknown	11655	3
Treatment			
	BR	207323	58
	RI	112810	32
	BRRI	35114	10

358 **Poster Session (Board #C10), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Association of salvage cryoablation with decreased utilization of androgen deprivation therapy for recurrent prostate cancer after radiotherapy.

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Background: Cryoablation is an established treatment for recurrent prostate cancer after primary radiotherapy, but outcomes data are mostly limited to uncontrolled case series. We assessed salvage cryoablation efficacy with a comparative analysis in a large national cohort. **Methods:** Patients with clinically localized prostate cancer treated with primary radiotherapy from 2000 to 2015 were identified in the Veterans Affairs Informatics and Computing Infrastructure (VINCI) dataset. Prostate-specific antigen (PSA) recurrence was defined as nadir + 2 ng/mL. Inclusion criteria included availability of serial PSA measures for $\geq$ 3 years after completion of radiotherapy and PSA $<$ 10 ng/mL at recurrence. Salvage cryotherapy was identified with procedure- and fee-based billing codes. Chi square and Wilcoxon analysis was utilized for descriptive statistics; and Kaplan Meier analyses for time to androgen deprivation therapy (ADT). **Results:** Among 35,502 patients who underwent primary radiotherapy, 4,391 (12.3%) developed biochemical recurrence a median (IQR) of 4.5 (2.7, 6.9) years after treatment. Of these, 3889 (88.9%) had PSA $<$ 10 ng/mL at time of recurrence, of whom 95 (2.4%) underwent salvage cryoablation. Cryoablation patients were younger at initial diagnosis (60 years versus 65 years, $p < 0.01$); had a lower pre-treatment PSA (6.6 ng/mL versus 7.8 ng/mL, $p < 0.01$); and had a lower PSA nadir (0.04 ng/mL versus 0.19 ng/mL, $p<0.01$). There were no between-group differences for clinical stage at initial diagnosis ($p = 0.22$) or African American prevalence (34.7% versus 29%, $p =0.27$). After recurrence, median (IQR) follow-up for those who did and did not receive cryoablation was 9.1 (7.2, 9.11) and 8.1 (5.4, 10.9) years, respectively. Cryoablation patients were less likely to receive ADT (40% versus 55%, $p < 0.01$); and, among those who did, time to ADT from recurrence was significantly longer compared to those who did not receive cryoablation (15.5 months versus 5.8 months, $p<0.01$). **Conclusions:** Salvage cryoablation is associated with decreased utilization of ADT in patients with biochemical recurrence after radiation. Research Sponsor: None.

359 **Poster Session (Board #C11), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Treatment timing in localized high-risk prostate cancer treated with radiation and androgen deprivation therapy.

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Background: Data regarding the impact of overall treatment time in prostate radiotherapy predate the dose escalation era and is absent in high risk disease. We hypothesize that delays in initiating androgen deprivation therapy (ADT) and in completing fractionated radiotherapy (XRT) correlate with worse outcomes in high risk prostate cancer. **Methods:** Using the National Cancer Database, we identified 9,611 cases of localized high risk prostate cancer, defined as Grade groups 4 and 5 (Gleason 8-10), PSA $<$ 40, and T1-T3N0M0, treated with conventionally fractionated XRT (74-81 Gy, median 78 Gy) and ADT between 2010-2014 with at least 12 months follow-up (median 40). Receiver operating characteristic (ROC) analyses determined a-priori values for days to initiation of treatment (ADT or XRT) and number of "missed" treatment days (number of days beyond the minimum required to complete XRT). Multivariable regression models with propensity matching conveyed the relative impact of these timing parameters on survival. **Results:** The median time from diagnosis to treatment intervention was 63 days and median missed XRT treatment days was 2.2. The greatest difference in survival was seen when intervention was initiated beyond 74 days from diagnosis (HR=1.21, P=0.045) and when more than 3 XRT treatment days were missed (HR=1.27, P=0.006). Only missed treatment days correlated with survival as a continuous variable (HR=1.028, P$<$0.001) on multivariable analysis. On a multivariable regression model propensity-matched for missed treatment days, independent predictors for worse survival include older age, higher comorbidity score, dose below 78 Gy, grade group 5, and PSA $>$ 20. Greater than 3 missed treatment days remained an independent predictor; adjusted HR = 1.23 (P=0.002). The lone predictors of missed treatments was African American race (OR=1.21). **Conclusions:** Although outcomes in prostate cancer are not typically thought to be associated with treatment time, our study, the largest such analysis to date, revealed a strong independent correlation between timely completion of XRT and survival in high risk disease. The association between survival and time to initiating ADT was not nearly as strong. Research Sponsor: None.

360 **Poster Session (Board #C12), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Physical activity assessment among men undergoing genetic counseling for inherited prostate cancer: A teachable moment.

Veda N. Giri, Brandy-Joe Milliron, Elizabeth Sinclair, Elias Obeid, Christa Smaltz, Meaghan Butryn, Michael Bruneau; Sidney Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA; Wake Forest University School of Medicine, Winston-Salem, NC; Drexel University, Philadelphia, PA; Fox Chase Cancer Center, Philadelphia, PA; Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, PA

Background: Genetic counseling (GC) and genetic testing (GT) for prostate cancer (PCA) is growing rapidly for men with or at risk for PCA. GC provides opportunities to promote a healthy lifestyle and is understudied in men. To inform future lifestyle interventions, we assessed adherence to physical activity (PA) guidelines among a sample of men undergoing PCA GC/GT at two academic institutions. **Methods:** Participants enrolled in the Genetic Evaluation of Men study completed a structured lifestyle questionnaire to assess frequency of PA over the past year, including intensity of aerobic activity and strength-based activities. Data were evaluated as M±SD by PCA status, PCA aggressiveness (Gleason>7, T3, or metastatic disease), family history, and body mass index (BMI) with Chi-Square contingency analyses and adjusted residuals. Demographic characteristics predictive of PA adherence with current Department of Health and Human Services and American College of Sports Medicine PA guidelines were assessed using logistic regression analyses. Alpha levels were set *a priori* to $p<.05$. **Results:** Men with (n=158) or at risk (n=96) for PCA who underwent GC/GT were included; 84% were overweight or obese. Men with PCA had less adherence to engaging in moderate (p=.02) and vigorous (p=.01) PA than men without PCA. Men overall who reported engaging in strength-based PA did meet the recommended guideline of 2-3 days per week ($p<.01$). Lower BMI (p=.05) and higher education ($p<.01$) were found to be significant predictors for adherence to vigorous PA; older age (p=.02) and higher education ($p<.01$) were found to be significant predictors for adherence to strength-based PA; and, higher education (p=.02) was found to predict adherence to light and moderate PA ($p<.05$). **Conclusions:** High proportions of men undergoing PCA GC/GT were overweight/obese. Furthermore, men with PCA did not adhere to current PA guidelines. Age, BMI, and education were important predictors of PA engagement, which should be considered in intervention development. GC encounters represent "teachable moments" to promote healthy lifestyle among men, which may have additional benefit for survivorship and improved treatment experience. Research Sponsor: None.

361 **Poster Session (Board #C13), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

The relationship between socioeconomic status and treatment for prostate cancer in a universal healthcare system: A population-based analysis.

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Background: A large body of research has shown that there are strong socioeconomic disparities in access to cancer treatment. However, whether these inequalities persist among men with prostate cancer has not been previously explored in the equal-access, universal Canadian health care system. The aim of this study is to compare whether socioeconomic status is associated with the type of treatment received (radical prostatectomy (RP) versus radiation therapy (RT)) for men diagnosed with nonmetastatic prostate cancer in Manitoba, Canada. **Methods:** Men who were diagnosed with non-metastatic prostate cancer between 2004 and 2016 and subsequently treated with RP or RT were identified using the CancerCare Manitoba Registry and linked to provincial databases. SES was defined as neighbourhood income by postal code and divided into income quintiles (Q1-Q5, with Q1 the lowest quintile and Q5 the highest). Multivariable logistic regression nested models were used to compare whether socioeconomic status was associated with treatment type received. **Results:** We identified 4,560 individuals between 2004-2016 who were diagnosed with non-metastatic prostate cancer. 2,554 men were treated with RP and 2,006 with RT.As income quintile increased, men were more likely to undergo RP than RT (Q3 vs Q1: aOR 1.45 (1.09-1.92); Q5 vs. Q1: aOR 2.17, 95% CI 1.52-2.86). **Conclusions:** Despite a universal health care system, socioeconomic inequities are present for men seeking primary treatment for prostate cancer. Further investigation into the decision making process among patients diagnosed with prostate cancer may inform decision making to ameliorate these disparities. Research Sponsor: University of Manitoba Department of Surgery.

362 **Poster Session (Board #C14), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Rates and determinants of prostatectomy in prostate cancer (PCa) patients with node-positive disease.

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Background: Consensus guidelines recommend that PCa patients with "regional risk" clinical node positive (cN1) disease undergo EBRT and ADT. However, many of these patients still undergo radical prostatectomy (RP), and the role of clinical node status in predicting benefit from RP is debated. Using National Cancer Database (NCDB), we sought to characterize the rates and determinants of initial RP for cN1 patients, and to assess the prognostic significance of clinical nodal stage for patients undergoing RP with pathologic node involvement (pN1). **Methods:** Among incident cases of nonmetastatic PCa within NCDB (2004-2012), we identified two cohorts: (1) patients with cN1 disease, and (2) patients with pN1 post-RP. For the cN1 cohort, factors associated with initial RP were evaluated using univariate logistic regression, and post-surgical pathologic staging and adjuvant therapies were described. For the pN1 cohort, multivariate Cox regression was used to compare overall survival (OS) by preoperative clinical stage (cN1 vs cN0). **Results:** Of 7787 patients with cN1 disease, 2166 underwent initial RP, with consistent annual rates (24-31%) over the study period. Factors independently associated with higher likelihood of RP included age $\leq$ 65 (HR 1.8), white race (HR 1.4), private insurance (HR 1.8), T stage $\geq$ T2C (HR 1.3), PSA $\leq$ 10 (HR 1.6), and Gleason score $<$8 (HR 1.4). Of cN1 patients who underwent RP, 84% were pN1 and 26% were pN0. 26% of these cN1/pN1 patients later received RT, 49% received ADT, and 20% received both. Separately, among 7396 PCa patients with pN1 disease after RP, 17% were initial cN1 and 83% were cN0. After adjustment for practice setting, patient, and disease variables, initial cN1 clinical stage was associated with significantly worse OS (HR = 1.2, p=0.04). **Conclusions:** The initial treatment of regional risk cN1 disease is highly variable, with approximately 1 in 4 patients undergoing initial prostatectomy, the vast majority of whom are confirmed pN1. Among all patients with pN1 disease, clinical nodal staging retains prognostic significance for OS. These findings underscore the utility of initial clinical staging when considering initial and adjuvant treatments for regional risk patients. Research Sponsor: None.

363 Poster Session (Board #C15), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Impact of overall survival (OS) as a function of facility caseload on feasibility of referral of radical prostatectomy (RP) to higher volume facilities.

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Background: We recently reported a significant all-cause mortality (ACM) risk reduction associated with higher annual caseload for RP (PMID 31398279). Four volume groups (VG) were defined as VG1: $<50^{th}$, VG2: 50^{th}-74^{th}, VG3: 75^{th}-89^{th} and VG4: top 10 percentile of caseload. The adjusted OS difference between VG1 and VG4 at 90^{th} percentile survivorship reached 13.2 months, HR 1.30 ($p<0.0001$). Here we explore this economics of referral to VG4. **Methods:** Using a Markov model, we designed 4 scenarios (Sc) where 100,000 RPs were performed. In Sc 1 all RPs were performed at VG1; in Sc 2, 3 & 4, all RPs were performed at VG2, 3 &4 respectively. Subjects were followed for up to 20 years after RP. Survival and costs of care for each Sc were recorded. Probabilities of PSA recurrence (PSAR), development of metastatic disease (Met), cancer specific mortality (CSM) and ACM were adjusted for each VG according to the published HRs. Savings resulting from fewer recurrences, avoidance of salvage radiation therapy (SRT) and management of fewer Met were calculated. Standard discounting at 3% were applied to costs and benefits. Survival benefit and costs savings associated with making referrals from VG1, VG2, or VG3 centers to VG4 center were calculated. Using a willingness to pay (WTP) of $50K per life years gained (LYG), the maximum referral costs (MRC) were calculated. **Results:** Referral from a VG1 to a VG4 center was associated with highest OS benefit of 720 LYG at 20 years of follow up per 1000 referrals (PKR). Within a WTP of $50K, MRC of up to $37K was cost effective- Table. **Conclusions:** Given the survival benefit associated with performing RP at facility with high annual caseload, significant resources could be allocated to making a referral possible while still remaining within cost effectiveness boundaries. Research Sponsor: None.

	At	VG3 to VG4 Year 20	VG2 to VG4 Year 20	VG1 to VG4 Year 20
VG4 Referrals		100,000	100,000	100,000
↓Events- PKR	PSAR	67	82	59
	Met	27	33	26
	SRT	36	45	33
↓Mortality- PKR	Cancer	22	27	29
	All Cause	62	76	103
↑Survival- PRK	NED	740	909	1,037
	OS	405	501	720
↓Costs	SRT	$ 536	$ 665	$ 535
(per referral)	Met	$ 445	$ 512	$ 106
	Year of Death	$ 572	$ 720	$ 805
	All	$ 1,554	$ 1,897	$ 1,446
MRC	Referral Costs	$ 21,816	$ 26,967	$ 37,451
(per referral)				

364 **Poster Session (Board #C16), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

The prevalence of cardiovascular disease and its risk factors among prostate cancer patients treated with and without androgen deprivation.

Jehonathan H. Pinthus, Bobby Shayegan, Laurence Klotz, D. Robert Siemens, Patrick P. Luke, Tamim Niazi, Vincent Fradet, Yves Fradet, Emmanuelle Duceppe, Luke Lavallee, Negareh Mousavi, Robert James Hamilton, Ian Brown, Joseph Chin, Darin Gopaul, Philippe Violette, Margot Davis, Rajibul Mian, Sarah Karampatos, Darryl Leong, RADICAL-PC Investigators; McMaster University, Hamilton, ON, Canada; Juravinski Cancer Centre, McMaster University, Hamilton, ON, Canada; Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; Queen's University, Kingston, ON, Canada; London Health Sciences Centre, London, ON, Canada; Jewish General Hospital, McGill University, Montreal, QC, Canada; Hotel-Dieu de Quebec (CHUQ), Quebec City, QC, Canada; Laval University, Quebec City, QC, Canada; University of Montreal, Montreal, QC, Canada; The Ottawa Hospital, Ottawa, ON, Canada; McGill University, Montreal, QC, Canada; Division of Urologic Oncology, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; Niagara Health System, Niagara Falls, ON, Canada; Grand River Hospital, Kitchener, ON, Canada; University of Western Ontario, London, ON, Canada; UBC Faculty of Medicine, Department of Cardiology, Vancouver, BC, Canada

Background: Cardiovascular disease (CVD) is the second most common cause of death in prostate cancer (PC) patients, yet the prevalence of CVD and its risk factors have been incompletely described in this population. Androgen deprivation therapy (ADT) is a risk factor for CVD. The objective of this study were to describe the CVD characteristics and risk factors in PC patients and the relationship between CVD risk and how ADT is used in real-world practice. **Methods:** RADICAL-PC (Role of Androgen Deprivation Therapy in CArdiovascular Disease – A Longitudinal Prostate Cancer Study) is an ongoing prospective cohort study. We recruited 2395 consecutive men (mean age 68 years) with newly diagnosed PC or with a plan to prescribe ADT for the first time. Cardiovascular risk was estimated by calculating Framingham risk scores. A Framingham score $>$17 (corresponding with a predicted 10-year CVD risk of $>$30%) was considered high-risk. Multivariable logistic regression was performed with ADT use as the outcome variable and CVD risk factors as the exposures of interest. **Results:** The prevalence of known CVD for the entire cohort was 22% and 35% had a Framingham risk score $>$17. Most participants (58%) were current or former smokers; 16% had diabetes; 45% had hypertension and 23% had high blood pressure but had not received a diagnosis of hypertension; 31% were obese (BMI $\geq$30kg/m^2); 24% had low levels of physical activity. There was a positive relationship between each major cardiovascular risk factor and the use of ADT. However, after adjustment for age, education, alcohol use, BMI and time from PC diagnosis to eligibility assessment, these associations were significantly attenuated. Participants in whom ADT was planned had higher Framingham risk scores than those not intending to receive ADT. This risk was abolished after adjustment for confounders. **Conclusions:** One in three men with PC is at high cardiovascular risk. Men receiving ADT are *a priori* at higher CVD risk than PC patients whose treatment strategy does not include ADT. These differences are explained by confounding factors. Clinical trial information: NCT03127631. Research Sponsor: Prostate Cancer Canada.

365 **Poster Session (Board #C17), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Stereotactic body radiotherapy boost toxicity for high and intermediate-risk prostate cancer: Report of a multi-institutional study.

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Background: External beam radiation therapy (EBRT) with androgen suppression (AS) and low dose rate (LDR)brachytherapy boost has been shown to improve biochemical progression free survival in unfavorable intermediate risk and high-risk prostate cancer (PC) compared to EBRT and AS. Excellent rates of local control in locally advanced prostate cancer with EBRT with high dose rate brachytherapy (HDR) boost. Prostate Stereotactic Radiosurgery (SBRT) may be an alternative to brachytherapy in patients with unfavorable intermediate and high-risk PC. Here we report the toxicity of pelvic lymph node/prostate EBRT and SBRT as the radiation boost in a large retrospective cohort. **Methods:** 473 patients with intermediate or high-risk PC, from the Radiosurgery Society Registry, Beth Israel Deaconess Medical Center, Georgetown University, and 5 Australian centers, were included. Patients received treatment from 3/2004- 9/2018 were the basis of this IRB approved retrospective study. The prostate and pelvis nodes were treated with between 36-50.4 Gy in 1.8/2.0 Gy fractions of radiation therapy EBRT. Patients received a SBRT boost to the prostate. Boost dose was 19-19.5 Gy (range 19-36.25 Gy). 274 and 199 patients presented with unfavorable or high-risk disease. The median follow-up was 33 months (IQR:18-63). **Results:** 33 deaths of 473 patients occurred in this cohort, 8 of which were caused by PC. There were 13.9% (n=66) acute Grade 1 or 2 GI toxicities (11.8% grade 1, 2.1% grade 2). There were 27.7% (n=131) acute Grade 1 or 2 GU toxicities (19.2% grade 1, 8.5% grade 2). No severe acute GU or GI toxicities were reported. There were 32 (6.8%) Grade 1 and 3 (0.6%) Grade 2 late GI toxicities. There were 9 (1.9%) Grade 3 and 1 (0.2%) Grade 4 late GI toxicities. There were 60 (12.7%) Grade 1 and 23 (4.9%) Grade 2 late GU toxicities. 15 (3.2%) Grade 3, but no Grade 4 late GU toxicity were reported. **Conclusions:** In this large multi-institutional retrospective cohort SBRT boost to pelvic/prostate EBRT had acceptable acute and late toxicities. The high dose per fraction of SBRT is similar to the dose delivered with HDR. This data raises the hypothesis that SBRT boost should be evaluated in additional clinical trials. Research Sponsor: None.

366 **Poster Session (Board #C18), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Adjuvant radiotherapy following radical prostatectomy for prostate cancer: A systematic review and meta-analysis.

Tobias Engel Ayer Botrel, Otávio Clark, Francisco Flávio Horta Bretas, Marcus V. Sadi, Ubirajara Ferreira, Luciano Paladini, Wagner Eduardo Matheus, Rodolfo Reis, Ronilson Oliveira Duraes, Antônio Carlos Lima Pompeu; CIOP, Poços de Caldas, Brazil; Evidencias-Kantar Health, São Paulo, Brazil; CoBEU - Comitê Brasileiro de Estudos em Uro-oncologia, Belo Horizonte, Brazil; Hospital Israelita Albert Einstein, São Paulo, Brazil; State University of Campinas (Unicamp), Campinas, SP, Brazil; CoBEU - Comitê Brasileiro de Estudos em Uro-oncologia, Campinas, Brazil; The University of Texas MD Anderson Cancer Center, Houston, TX; CIOP, Poços De Caldas, Poços de Caldas, Brazil; CoBEU, São Paulo, Brazil

Background: To perform a systematic review and meta-analysis of all randomized controlled trials (RCTs) comparing efficacy of adjuvant radiotherapy (AR) versus expectant management (EM) in men who undergo radical prostatectomy for localized prostate cancer (CaP). **Methods:** To perform this review and meta-analysis,several databases were searched, including MEDLINE, EMBASE, LILACS, and CENTRAL. We included all the studies that compared AR versus EM after radical surgery for CaP. The primary endpoints analyzed were biochemical progression-free survival (bPFS), metastasis-free survival (MPFS), prostate cancer-specific survival (CSS), overall survival (OS) and side effects. The data extracted from the studies were combined by using the Hazard Ratio (HR) or Risk Ratio (RR) with their corresponding Confidence Intervals of 95% (CI95%). **Results:** Overall, 68 studies were identified and screened. The final analysis included 7 trials (EORTC 22911, SWOG 8794, ARO 96-02/AUO AP 09/95, RAVES, FINNISH, GETUG-AFU 17 and RADICALS-RT) comprising 4,221 patients. The bPFS was higher in patients who received AR (fixed effect: HR = 0.58, CI95% = 0.52 to 0.66; $p < 0.00001$) but with significant heterogeneity (Chi^2 = 40.34, df = 6 ($P < 0.00001$); I^2 = 85%). We performed a random-effect model analysis to better explore this heterogeneity: in this analysis, the result remained in favor of AR (random effect: HR = 0.64, CI95% = 0.45 to 0.90; p = 0.01). The MPFS also was higher in patients who received AR (HR = 0.77, CI95% = 0.65 to 0.91; p = 0.002). The CSS and OS were not statistically different in patients with or without adjuvant radiotherapy (HR = 0.79, CI95% = 0.47 to 1.32; p = 0.36 and HR = 0.92, CI95% = 0.77 to 1.11; p = 0.38, respectively). The incidence of adverse events (gastrointestinal and genitourinary) were higher in the AR group. **Conclusions:** This is the first meta-analysis including the seven available RCTs in the literature (the previous meta-analysis reviewed only three), comparing adjuvant radiotherapy versus expectant management following radical prostatectomy for CaP. Adjuvant radiotherapy statistically increased the bPFS and MPFS, but did not have an impact on the OS or CSS. Research Sponsor: None.

367 **Poster Session (Board #C19), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Redefining the role of adjuvant versus salvage radiation therapy for prostate cancer after radical prostatectomy for T3 disease and/or positive margins.

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Background: SWOG 8794 recommends adjuvant radiation therapy (ART) after radical prostatectomy (RP) for T3 and/or positive margins. Our purpose was to assess 12-year outcomes on 862 RP patients who had either T3 and/or positive margins who underwent surveillance, salvage radiation therapy (SRT), or hormonal therapy (HT), while categorizing these patients into very low risk (VLR), low risk (LR), high risk (HR), and ultra high risk (UHR) groups. **Methods:** From 2004 - 2007, 862 RP patients had adverse factors of extracapsular penetration (T3a), seminal vesicle invasion (T3b), positive margins, and/or detectable post-operative PSA. Management included surveillance (54.8%), SRT (36.8%), and HT (8.5%) as first salvage therapy, and 21.5% eventually received hormonal therapy. Twenty patients underwent ART, and were excluded from this analysis. We assessed prognostic factors using multivariable analysis, and 12-year estimates of freedom from biochemical failure (FFBF), freedom from salvage therapy (FFST), distant metastases-free survival (DMFS), prostate cancer-specific survival (PCSS), and overall survival (OS). VLR were those with Gleason Score (GS) of 6. LR were GS 3+4 with only T3a or positive margins, but an undetectable postoperative PSA $<$0.1. HR were T3b with GS 7-10, any GS 7-10 with T3a/b and positive margins, but an undetectable PSA. UHR were those with a detectable PSA with a GS 7-10. **Results:** Median follow-up was 12.1 years. Median age was 61.6 years. Median time to first salvage treatment for VLR, LR, HR, and UHR were 10.8, 11.1, 5.3, and 0.6 years, $p<0.001$. 12-year estimates of FFBF for VLR, LR, HR, and UHR were 60.2%, 52.9%, 28.4%, and 0%, $p<0.0001$. For FFST, 70.9%, 68.6%, 40.5%, and 0%, $p<0.0001$. For DMFS, 99.1%, 97.8%, 88.6%, and 63.6%, $p<0.0001$. For PCSS, 99.4%, 99.5%, 93.5%, and 78.9%, $p<0.0001$. For OS, 91.8%, 91.8%, 81.0%, and 69.9%, $p<0.0001$. **Conclusions:** Outcomes of T3 and/or positive margins using surveillance or SRT as initial management yields excellent outcomes for VLR and LR groups, in which ART should be avoided. For HR, ART can be considered reasonable, since FFBF is only 28.4%. For VHR, these patients may benefit from combined hormonal therapy and ART. Research Sponsor: None.

368 Poster Session (Board #C20), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

A tale of lineage plasticity: Intense neoadjuvant testosterone lowering therapy in localized prostate cancer (PCa) harboring high-risk genomic signatures.

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Background: PCa is driven by androgen receptor (AR) signaling and neoadjuvant therapy with AR inhibitors offer an opportunity to improve cure rates in high-risk PCa particularly with utilization of multiparametric MRI (mpMRI). A loss of AR-regulated lineage characteristics and genomic loss of tumor suppressors *RB1* and *TP53* or mutations in DNA damage repair (DDR) genes can represent aggressive prostate variants. We conducted a feasibility study using mpMRI to evaluate tumor responses and resistance in newly diagnosed, high-risk PCa *(NCT02430480)*. **Methods:** Pts were treated with androgen deprivation therapy (ADT) + enzalutamide (enza) 160 mg daily for 6 months (mos). Pts underwent 2 mpMRIs: baseline and post 6 mos treatment (trt). Post-trt mpMRI was followed by radical prostatectomy (RP). Primary endpoint: feasibility of mpMRI for localization and detection of PCa before and after ADT + enza. **Results:** 39 pts were enrolled on-study with 36 pts completing 6 mos trt and undergoing RP. Of 39 pts, 3 had disease progression. **Conclusions:** Neoadjuvant intense testosterone lowering therapy shows activity in PCa but a subset of pts not respond to AR-targeted therapies through lineage plasticity enabled by characteristic loss of *RB1* and *TP53* or due to genetic alterations. Identification of this high-risk patient population, along with development of treatment options, needs further investigation. Clinical trial information: NCT02430480. Research Sponsor: U.S. National Institutes of Health.

Patient	Gleason Score	Pathology	Source	Post-trt mpMRI	PSA at end of trt	Genomic Analysis
1	9	Extracapsular extension. Seminal vesicle invasion. (+) bladder neck margin	RP	Decrease in size of midline apical-base peripheral zone lesion. Stable possible bladder trigone involvement	Undetectable	Pathogenic germline variant in *BRCA2* p.1614fs
2	10	Focal neuroendocrine features. Extracapsular invasion. Seminal vesicle involvement	RP	Slight progression of a lesion invading the right seminal vesicle and bladder	Undetectable	*TP53* and *RB1* variants. TMPRSS2-ERG fusion. *PTEN* copy number loss
3	9	Poorly differentiated adenocarcinoma	Prostate Biopsy	Increase in size of a large intraprostatic lesion affecting the prostate gland	0.14 ng/mL	*PALB2, RB1, PTEN* and *TP53* variants

369 **Poster Session (Board #D1), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

The efficacy and safety of radical prostatectomy and radiotherapy in high-risk prostate cancer: A systematic review and meta-analysis.

Zhipeng Wang, Yuchao Ni, Junru Chen, Guangxi Sun, Xingming Zhang, Jinge Zhao, Xudong Zhu, Haoran Zhang, Sha Zhu, Jindong Dai, Pengfei Shen, Hao Zeng; West China Hospital, Chengdu, China; West China Hospital, Sichuan University, Chengdu, China; Department of Urology, Institute of Urology, West China Hospital of Sichuan University, Chengdu, China

Background: The optimal treatment for patients with high-risk prostate cancer (PCa) remains debate and selection of patients to receive proper therapy is still an unsettled question. This systematical review was to compare the effectiveness of prostatectomy (RP) and radiotherapy (RT) in patients with high risk prostate cancer (PCa) and to select candidates for optimal treatment. **Methods:** PubMed, EMBASE, and Cochrane Central Register of Controlled Trials were searched for eligible studies. We extracted hazard ratios (HRs) and 95% CI of included studies. The primary outcomes were overall survival (OS) and cancer-specific survival (CSS); the secondary outcomes were biochemical recurrence-free survival (BRFS), metastasis-free survival (MFS) and clinical recurrence-free survival (CRFS). The meta-analysis was performed using Review Manager 5.3. Subgroup analyses were conducted according to GS, T stage and RT types. Quality of life (QOL) was compared with these two treatments. **Results:** A total of 25 studies were included. Overall, RP showed more survival benefits than RT on CSS (P=0.003) and OS (P=0.002), while RT was associated with a better BRFS (P=0.002) and MFS (P=0.004). Subgroup analyses showed RT was associated with similar or even better survival outcomes compared to RP in patients with high GS, high T stage or received external beam radiotherapy plus brachytherapy (EBRT+BT). As for QOL, RP was associated with poorer urinary and sexual function but better performance in the bowel domain. **Conclusions:** RP could prolong the survival time of patients with high risk PCa; however, RT could delay disease progression, and combined RT (EBRT+BT) even brought better CSS and similar OS than RP. RT might be the prior choice for patients with high T stage or high GS. RP could lead to poorer urinary and sexual function, while brought better performance in the bowel domain. Research Sponsor: National Clinical Research Center for Geriatrics (Z2018A01), National Natural Science Foundation of China (NSFC 81974398 and 81672547) and 1.3.5 project for disciplines of excellence.

370 Poster Session (Board #D2), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Utilization of androgen deprivation therapy (ADT) and stereotactic body radiation therapy (SBRT) for localized prostate cancer (PC) in the United States (US).

Trevor Joseph Royce, Jeffrey M. Switchenko, Chao Zhang, Daniel Eidelberg Spratt, Ronald C. Chen, Ashesh B. Jani, Sagar Anil Patel; University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC; Emory University, Department of Biostatistics and Bioinformatics, Atlanta, GA; University of Michigan, Ann Arbor, MI; University of Kansas, Kansas City, KS; Winship Cancer Institute of Emory University, Atlanta, GA

Background: Randomized trials have demonstrated improved survival with the addition of ADT to conventionally fractionated radiotherapy (RT) for men with unfavorable intermediate risk (UIR) and high-risk (HR) prostate cancer (PC). The benefit of ADT with SBRT is unknown. The purpose of this study is to examine ADT utilization with SBRT in the US. **Methods:** Men $>$ 40 years old with localized PC treated with external beam RT for curative intent between 2004-2015 were analyzed from the National Cancer Database. Patients who received brachytherapy, surgery, or lacked ADT or risk stratification data were excluded. A total of 7,559 men treated with SBRT ($\geq$5Gy/fraction; $\leq$5 fractions; dose $\geq$25Gy) versus 133,825 men treated with moderate or conventional RT ($\leq$3Gy/fraction; dose $\geq$60Gy) were included. Patients were stratified by risk: low (LR), favorable intermediate (FIR), UIR, and HR using NCCN criteria. Differences between RT and SBRT were determined via Chi-square test. **Results:** Among all PC treated with RT, SBRT use increased from 2004 to 2015 across risk groups – overall: 0.9% to 10.3%; LR: 0.9% to 21.6%; FIR: 1.1% to 13.7%; UIR: 0.6% to 10.8%; HR: 0.8% to 2.8%; $p < 0.001$. Among all PC treated with RT, ADT use declined from 2004 to 2015 for LR (22.8% to 5.5%), FIR (51.7% to 40.0%), UIR (53.4% to 49.5%), but not HR (78.9% to 84.2%); $p < 0.001$. Patients with EBRT were more likely to receive ADT compared to those with SBRT across risk groups (Table). **Conclusions:** The majority of patients receiving SBRT for UIR and HR disease in the US do not receive concurrent ADT, despite national guideline recommendations and the lack of level 1 evidence to support this practice pattern. The omission of ADT may result in inferior oncologic outcomes, and randomized trials are needed to establish the safety of omitting ADT with SBRT for higher risk PC. Research Sponsor: None.

	RT		SBRT		
ADT	No N (%)	Yes N (%)	No N (%)	Yes N (%)	p-value N (%)
Overall	67976 (50.8)	65849 (49.2)	6393 (84.6)	1166 (15.4)	$<$ 0.001
LR	25755 (86.9)	3895 (13.1)	2511 (95.0)	131 (5.0)	$<$ 0.001
FIR	28454 (57.4)	21157 (42.7)	2732 (85.1)	477 (14.9)	$<$ 0.001
UIR	5476 (51.8)	5094 (48.2)	546 (80.8)	130 (19.2)	$<$ 0.001
HR	8291 (18.9)	35703 (81.2)	604 (58.5)	428 (41.5)	$<$ 0.001

371 Poster Session (Board #D3), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

Determinants of biochemical failure and distant metastases-free survival in high-risk prostate cancer patients treated with external beam radiotherapy.

Avinash Pilar, Andrew Bayley, Danny Shehata, Zhihui (Amy) Liu, Alejandro Berlin, Charles N. Catton, Vickie Kong, Tara Rosewall, Mary K. Gospodarowicz, Tim Craig, Joelle Helou, Padraig Richard Warde, Peter W. M. Chung; Radiation Medicine Program, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada

Background: Objectives were to1) identify predictors of biochemical failure(BCF) -free survival (FFS) & distant metastases free-survival (DMFS) in high-risk prostate cancer (HRPC) patients treated with external beam radiotherapy (EBRT) with or without androgen deprivation therapy (ADT); 2) assess the impact of nodal irradiation & escalation of dose to the nodal volumes in HRPC. **Methods:** Between Feb 2000 & May 2011, 462 patients with HRPC were treated with EBRT +/- ADT. This spanned an era of technical development; prior to 2002 conventional dose radiotherapy was routinely delivered, between 2002-2008, dose escalation to the prostate & pelvic lymph nodes was undertaken in a phase II trial & subsequently all patients were treated with a dose-escalated protocol. The disease characteristics included, a median PSA of 20ng/ml (range: 1-563), T3-T4 in 33% (n=158), & Gleason grade group (GGG) 3-5 in 72% (n=331). The majority (n=405, 88%) received ADT with EBRT & median duration of ADT was 36 months (range: 0-197). Dose escalated EBRT was utilized in 52% (n=241) & nodal irradiation in 69% (n=317); escalation of dose to nodal volumes was performed in 20% (n=93). **Results:** The median follow-up was 8.7yrs (range: 0.9-18.9). Median nadir PSA was $<$ 0.05ng/ml (range: $<$0.05-5.78) with median time to nadir (TTN) of 11 months (range: 2-130). Cumulative incidence rates of BCF at 5 and 10-yrs were 23% & 45%; corresponding rates for DM were 6.6% & 14%, respectively. The 5 & 10-yr FFS rates were 75% & 51%; corresponding DMFS rates were 91.5% & 80%, respectively. On multivariate analysis, T stage ($p<0.001$), GGG ($p<0.001$), ADT (p=0.002), dose escalation to prostate (P=0.012) & median nadir PSA ($p<0.001$) were independent predictors of FFS. The GGG (p=0.007), median nadir PSA (p=$<$0.001) & Nodal RT (p=0.03) were independent predictors of DMFS. PSA of 20 & TTN predicted neither FFS nor DMFS. **Conclusions:** Nadir PSA level was an independent predictor of FFS & DMFS. Undetectable PSA level was associated with prolonged FFS & DMFS. Dose escalation to prostate resulted in an improved FFS & Nodal irradiation in an improved DMFS. Further studies are required to identify subgroups that may benefit the most from nodal irradiation. Research Sponsor: None.

372 **Poster Session (Board #D4), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Stereotactic radiotherapy +/- HDR boost for unfavorable-risk prostate cancer: Comparison of efficacy, survival, and late toxicity outcomes.

Andrew Loblaw, Patrick Cheung, Danny Vesprini, Stanley K. Liu, William Chu, Hans T. Chung, Gerard Morton, Bindu Musunuru, Andrea Deabreu, Melanie Davidson, Ananth Ravi, Joelle Helou, Ling Ho, Liying Zhang; Odette Cancer Centre, Sunnybrook Health Sciences Centre, Toronto, ON, Canada; Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; Department of Radiation Oncology, Odette Cancer Centre, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; Toronto-Sunnybrook Reg Cancer Centre, Toronto, ON, Canada; University of Pittsburgh Medical Centre, Pittsburgh, PA; Radiation Medicine Program, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; Sunnybrook Hospital, Radiation Oncology, University of Toronto, Toronto, ON, Canada

Background: The ASCO/CCO guidelines recommend brachytherapy boost for all eligible intermediate- or high-risk localized prostate cancer patients. Stereotactic body radiotherapy (SBRT) is an emerging treatment for prostate cancer but its use in high risk disease is limited. We compare efficacy, survival and late toxicity outcomes in patients treated on 2 prospective, phase 2 protocols that both use pelvic SBRT and androgen deprivation therapy (ADT). One used MR-guided HDR brachytherapy boost (SPARE) and the other uses a SBRT boost (SATURN). **Methods:** SPARE was a phase I/II study where intermediate (IR) or high-risk (HR) prostate cancer patients received HDR-BT 15Gy x 1 to the prostate and up to 22.5Gy to the MRI nodule and followed by gantry-based SBRT 25Gy in 5 weekly fractions delivered to pelvis. ADT was used for 6-18 months. SATURN was a phase II study where high risk patients received 40Gy to prostate and 25Gy to pelvis along in 5 weekly fractions with 12-18 months ADT. CTCAEv3 was used to assess toxicities and was captured q6months x 5 years. Biochemical failure (BF; nadir + 2 definition), nadir PSA, proportion of patients with PSA $<$ 0.4 ng/ml at 4 years (4yPSARR), incidence of salvage therapy, cause specific survival were calculated. Day 0 was first day of RT for all time-to-event analyses. **Results:** Thirty-two patients (NCCN 3% favorable IR, 47% unfavorable IR (UIR), 50% HR) completed SPARE while 30 patients (7% UIR, 93% HR) completed SATURN. Median follow-up of 50 and 48 months, respectively. Actuarial 4-year BF was 11.5% and 0%. Median nPSA was 0.02 ng/ml for both studies. 4yPSARR was 69% and 93%. 4-year cause-specific survival was 96% and 100%. Toxicities are listed in Table. **Conclusions:** In the context of SBRT pelvis and ADT, SBRT boost provides similar efficacy for unfavorable risk prostate cancer with acceptable but worse toxicities compared to HDR boost. A randomized study is recommended to answer this question. Clinical trial information: 01953055. Research Sponsor: Prostate Cancer Cancer; Ride for Dad.

Domain	Timing	SPARE (HDR boost)	SATURN (SBRT)	p-value
Genitourinary	Grade 2*	38%	70%	0.025
	Grade 3*	3%	0%	
Gastrointestinal	Grade 2*	0%	30%	0.001
	Grade 3*	0%	0%	
BF	4-year	11.5%	0%	0.059
CSS	4-year	96%	100%	0.33

*cumulative 6-60 months

373 Poster Session (Board #D5), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM

PIVOTALboost Trial contouring RTQA.

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Background: The PIVOTALboost trial (ISRCTN80146950) recruits patients with intermediate and high risk, localised prostate cancer; it tests the role of pelvic node radiotherapy and the effectiveness of a focal intra-prostate IMRT boost. Prior to opening to recruitment a contouring QA program was designed aiming to improve consistency in clinical outlining. **Methods:** Intra-prostatic boosting was a new treatment method for all but 3 trial centers. Guidelines for boost contouring and pelvic node outlining were circulated. Clinicians were sent two different cases with the clinical case description, biopsy details, the diagnostic pre-biopsy multi-parametric MRI (T2W and DWI sequences) and planning CT and MRI scans. They were asked to contour prostate, seminal vesicle (CTVp, CTVpsv), lymph node (CTVn) for 1 case and boost volume (GTVpb) for both cases. The 3 lead trial clinicians contoured the cases independently, agreed on gold standard outlines and criteria for failing the submission. Center' benchmark case submissions were reviewed and standardized feedback forms returned to each clinician. General issues were addressed during a trial launch workshop. **Results:** There was good agreement of the contours for CTVp, CTVpsv and CTVn between the 3 lead clinicians for the gold standard; more discussions were required to agree GTVpb. Criteria for re-submission were: contours >6mm beyond or >3mm inside the superior and inferior level, included OARs, excluded SV base or extracapsular extension. In addition, for GTVpb, the wrong segment, extension outside CTVp, outlining abnormalities <5mm in diameter or a volume > or < 50% of the gold standard. 35 center and 54 clinicians submitted outlines: for CTVp/psv 24/54 failed, CTVn 14/54 failed, GTVpb 23/48 failed (6 investigators did not submit a volume). All center passed the re-submission; for the on trial outlining review, 9 centres have not recruited a patient for the on trial review process, 18 passed and 8 failed. **Conclusions:** Errors and inconsistencies were common in the benchmark outlining exercises for the trial. Individual feedback, guidelines and clinical support has reduced outlining variations without delaying the opening of the trial; it has helped to standardize contouring and engage clinicians in the trial process. Clinical trial information: 80146950. Research Sponsor: CTAAC.

374 **Poster Session (Board #D6), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Adjuvant docetaxel after definitive radiotherapy for high-risk prostate cancer: A meta-analysis of randomized clinical trials.

Ray Manneh Kopp, Mauricio Lema, Linda Ibatá; Sociedad de Oncología y Hematología del Cesar, GOGUC Grupo de Oncología Genitourinaria de Colombia, Valledupar, Colombia; Clínica de Oncología Astorga, Medellín, Antioquia. Colombia, Colombia; Universidad Militar Nueva Granada, Bogotá, Colombia

Background: In order to improve long term results for high-risk prostate cancer, several clinical trials have tested the addition of docetaxel chemotherapy. The outcomes of this trials have not led to clear conclusions. We conducted a meta-analysis of randomized phase 3 trials testing the efficacy of docetaxel after radiotherapy in high risk prostate cancer patients. **Methods:** A systematic review of PubMed (Medline), Embase and the Cochrane Library was conducted. We followed the PRISMA guidelines, three investigators independently selected the articles and verified inclusion criteria. We compared the overall survival and disease-free survival between the intervention group (adjuvant chemotherapy with docetaxel) and the control group (without adjuvant chemotherapy) by calculating the hazard ratio (HR) with 95% confidence intervals (CIs). Pooled effects were calculated using random-effects or fixed-effects models based on the heterogeneity of included studies. **Results:** 382 publications were identified, four phase III trials (STAMPEDE, RTOG0521, SPCG-13, GETUG 12) comparing docetaxel vs standard of care after radiotherapy for high-risk prostate cancer fulfilled the inclusion criteria with data from 2034 patients (1135 in placebo group and 899 in adjuvant docetaxel group). Heterogeneity was not found between the included studies for OS (I^2 0%), but it was found between studies for disease-free survival (I^2 60%). Adjuvant docetaxel chemotherapy showed overall survival benefit when compared to ADT alone (HR 0,72 95% CI 0,54-0,96). Adjuvant docetaxel also improved the disease-free survival when compared to ADT alone (HR 0,74 95% CI 0,64-0,86). No evidence of publication bias was observed. **Conclusions:** This meta-analysis shows that docetaxel after definitive radiotherapy in high-risk prostate cancer is likely to be more effective than standard of care in terms of overall survival and disease-free survival. Further prospective studies are needed in order to increase the sample that would lead to show a more robust data. Research Sponsor: None.

375 **Poster Session (Board #D7), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Isotope selection and PSA failure in prostate seed implant: Experience with CS-131 in a community hospital system.

Jacquelyn G. Booher, Peter Domenig, Paul J. Chuba; Ascension St. John Macomb Oakland Hospital, Warren, MI; St John Ascension, Ferndale, MI; St. John Providence Webber Cancer Center, Warren, MI

Background: A recent large single institutional study reported excellent long-term biochemical control and survival for Cs-131 prostate implant. This isotope has short half-life (9.7 days) with clinical advantages including shorter duration of symptoms. We previously showed Cs-131 dosimetry to be quantitatively similar to I-125 with improved homogeneity (mean percent V150 36% for I-125 versus 27% for Cs-131 ($p < 0.0001$). Our objective was to evaluate PSA failure rates and dosimetric outcomes in a multi-institutional community based setting. **Methods:** Within an IRB approved retrospective study, we compared outcomes for three groups of permanent prostate implant patients treated at Ascension Macomb Oakland, Ascension Saint John, and Ascension Providence Rochester Hospitals over a 10 year time interval. The comparison groups included isotopes Cs-131 (n = 66; t1/2 9.7 days), I-125 (n = 60; t1/2 60 days), and Pd-103 (n = 60; t1/2 17 days). Kaplan Meier estimates of PSA failure used the nadir plus 2 (Phoenix) definition. **Results:** Standard permanent implant doses employed were 145 Gy for I-125 monotherapy or 109 Gy for combination therapy. The dose for Cs-131 was 115 Gy for monotherapy and 85 Gy for combination therapy. For Pd-103, the doses employed were 125 Gy and 90 Gy for mono- and combination therapy, respectively. Median age at diagnosis was Cs-131; 69 (range 49-80), I-125; 71 (49-78), and Pd-103; 70 (60-82). Mean pretreatment PSA values were Cs-131 5.73 ng/ml, I-125 6.62 ng/ml, and for Pd-103 8.87 ng/ml. Median PSA follow up was 30 months and the median PSA value at 60 months was 0.11 ng/ml. There was excellent PSA control for all three groups of cases (p = NS), however with fewer failures using Cs-131. **Conclusions:** Permanent interstitial brachytherapy continues to be an attractive option for treatment early stage prostate cancer. Only a few large single institutional studies have examined PSA failure rates or dosimetric aspects of shorter half-life Cs-131 seed implants. This series confirms wide applicability of Cs-131 permanent prostate seed implant in the community hospital setting. Research Sponsor: None.

376 **Poster Session (Board #D8), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

High-dimensional single cell-based immune profiling of the tumor immune microenvironment in prostate cancer.

Michela Masetti, Federica Portale, Roberta Carriero, Bianca Partini, Nicolò Morina, Andrea Ponzetta, Piergiuseppe Colombo, Maria Grazia Elefante, Alberto Saita, Giovanni Lughezzani, Nicolo' Buffi, Paolo Casale, Clelia Peano, Paolo Kunderfranco, Javier Cibella, Giorgio Ferruccio Guazzoni, Massimo Lazzeri, Diletta Di Mitri; IRCCS Humanitas Clinical and Research Center, Rozzano, Italy; IRCCS Humanitas, Rozzano, Italy; IRCCS Humanitas Clinical and Research Hospital, Rozzano, Italy

Background: Genetic lesions that drive prostate cancer (PCa) development are able to modify the immune response and tumor infiltrating immune subsets, resulting in tumor progression. We investigated the profile of the immune microenvironment in PCa by high dimensional single cell analysis. **Methods:** We conducted an immune profiling study based on integrated RNA single cell sequencing and multiparametric flow cytometry in order to dissect the immune landscape of PCa. CD45+ immune cells infiltrating tumoral and adjacent non tumoral tissues were isolated from patients with PCa who underwent software assisted fusion biopsy, based on MRI, and/or radical prostatectomy, and analyzed by single cell sequencing. The primary endpoint was to evaluate the effectiveness of single cell RNA sequencing on CD45+ cell sorted from tumoral and adjacent non-tumoral tissues. Secondary endpoint was the identification of tumor-driven immune changes in prostatic lesions. **Results:** The cohort consisted of 3 patients who underwent radical prostatectomy (RP) and 45 patients with positive prostate biopsy; the negative control was checked by pathological assessment. In patients who underwent RP the gene expression analysis identified a modulation in the abundance of several immune subsets infiltrating the tumoral tissue, when compared with the non tumoral, evident for Tumor associated macrophages (TAMs), Natural Killer cells (NK) and T regulatory cells. We then implemented a 22 parameters flow cytometry panel that we tested on fresh prostatic tissue and peripheral blood from positive PCa biopsies. We identified a subset of tumor infiltrating macrophages showing an altered gene expression profile when compared with macrophages infiltrating the non-tumoral tissue. Importantly we derived a genetic signature from this subset of tumoral TAMs that resulted to be associated with cancer progression. **Conclusions:** Our findings support the effectiveness of single cell RNA sequencing in the dissection of the immune landscape in PCa and identified immune changes in patients when comparing neoplastic tissue with non tumoral areas. Such data may be useful for understanding the role of immune system in PCa carcinogenesis. Research Sponsor: None.

377 **Poster Session (Board #D9), Fri, 12:15 PM-1:45 PM and 5:15 PM-6:15 PM**

Significance of distinct specifically enriched missense TP53 mutations in prostate cancer.

Irina Vasilevskaya, Jennifer McCann, Christopher McNair, Neermala Poudel Neupane, Peter Gallagher, Karen E. Knudsen; Sidney Kimmel Cancer Center at Jefferson University, Philadelphia, PA

Background: The most common *TP53* alterations are missense mutations occurring in the DNA binding domain. The majority of missense p53 mutants (mut-p53) demonstrate oncogenic gain-of-function (GOF) abilities, irrespective of wild-type p53 presence, and thus contribute to a more aggressive disease. In prostate cancer (PCa), characterized by comparatively low overall mutational burden, *TP53* is frequently mutated in both primary and advanced disease. Despite significant progress made in the field, detailed mechanisms of GOF in PCa remain undefined due to differing features of p53 mutants. **Methods:** Analysis of available datasets was performed to assess *TP53* mutational status in PCa patient samples and its correlation with the clinical outcome. Using hormone therapy sensitive and CRPC cells, a panel of cell lines was generated to model the two most frequently occurring mutations in the presence or absence of wild-type *TP53*, as occurs clinically. CHIP-seq, gene expression arrays, and *in vitro* and *in vivo* biological assays were performed to interrogate the significance of mut-p53 in PCa. **Results:** In PCa, missense mutations are significantly associated with decreased progression-free and overall survival. In PCa patient samples these mutations most commonly occur at the R273 residue, demonstrating specific enrichment when compared to other cancers, with R273C alteration being the most frequent. Using our cell panel, CHIP-seq data revealed an expansion of the p53 cistrome upon expression of R273C and R273H mutants in a manner distinct from p53 stabilization in the presence of wt-p53. Moreover, analysis of the *TP53* missense mutant-sensitive transcriptomes demonstrated differential gene expression between these mutants, related to the expression of wild-type *TP53* in those cells. Finally, R273C and R273H p53 mutants elicited context dependent effects on canonical p53 functions, thereby modulating distinct downstream biological outcomes. **Conclusions:** These data expand our knowledge of the underlying mechanisms by which distinct gain-of-function p53 mutants affect prostate cancer, and can lead to identification of novel therapeutic targets to improve clinical outcomes in PCa patients harboring these mutations. Research Sponsor: U.S. National Institutes of Health.

TPS378 **Trials in Progress Poster Session (Board #P20), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

MRI-targeted biopsies in prostate cancer screening and the value of its combination with blood-based risk-prediction: The randomized, diagnostic study STHLM3MRI.

Tobias Nordström, Andrea Discacciati, Fredrik Jäderling, Stefan Gosta Karlsson, Markus Aly, Henrik Gronberg, Martin Eklund; Karolinska Institutet, Department of Medical Epidemiology and Biostatistics, Stockholm, Sweden; Karolinska Institutet, Stockholm, Sweden; Karolinska Institutet, Department of Clinical Sciences, Danderyds Hospital, Danderyd, Sweden

Background: Blood-based biomarkers and magnetic resonance imaging followed by targeted biopsies have been suggested to improve detection of prostate cancer by increasing sensitivity to detect significant disease, decrease over-detection of low-risk cancers and avoid benign biopsies. The STHLM3-MRI projects aims to assess the value of combining blood-based risk prediction with bi-parametric MRI (bpMRI) in the prostate cancer diagnostic chain. **Methods:** The STHLM3MRI Main Study is a randomized, diagnostic study recruiting ≈10,000 Swedish men aged 50-74 for prostate cancer testing in a screen-by-invitation setting. The study design includes a first paired step (blood-test) followed by a randomized step (biopsy technique). Participants with elevated blood-test levels (PSA≥3ng/ml or Stockholm3 test≥11% risk of GG≥2 cancer) are recommended further work-up and randomized 2:3 to 12-core systematic biopsies (standard arm) or to bpMRI followed by MRI-targeted biopsies and systematic biopsies in men with PI-RADSv2 ≥3 lesions (experimental arm). Endpoints include number of detected prostate cancers, number of performed biopsy procedures and number of performed MRIs. The study is centralized to three biopsy sites, one radiology department and one pathology department. A data safety and monitoring board monitors study progress and participant safety. There are two pre-planned main analyses. First, we will report the first large randomized evidence comparing MRI-targeted biopsies and systematic biopsies for prostate cancer detection in a screen-by-invitation setting. Second, we will report a comparison of a diagnostic strategy including the Stockholm3 blood-test and MRI-targeted biopsies with standard practice using PSA and systematic biopsies. A third analysis will compare the use of the bloodtests PSA and Stockholm3 for risk-stratification of men undergoing MRI-targeted biopsy. 9 Oct 2019 the study had included 47% of planned participants (n = 4,701), aiming to close inclusion by March 2020 with first report during 2020. The study is registered at ClinicalTrials.gov: NCT03377881 and has regional ethical approval (2017-1280/31). Clinical trial information: NCT03377881. Research Sponsor: Swedish Cancer Society; Vetenskapsrådet; Erling Perssons Stiftelse.

TPS379 **Trials in Progress Poster Session (Board #P21), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Incorporating mpMRI and biomarkers in active surveillance protocols: The prospective Stockholm3 Active Surveillance trial (STHLM3AS).

Anna Lantz, Henrik Olsson, Tobias Nordström, Fredrik Jäderling, Lars Egevad, Magnus Annerstedt, Henrik Gronberg, Martin Eklund; Karolinska Institute, Uppsala, Sweden; Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden; Karolinska Institutet, Department of Medical Epidemiology and Biostatistics, Stockholm, Sweden; Karolinska Institutet, Stockholm, Sweden; Karolinska Institutet, Department of Oncology-Pathology (OnkPat), Karolinska University Hospital, Stockholm, Sweden

Background: Level one evidence shows that men with low-risk prostate cancer undergoing active surveillance (AS) with repeated PSA tests and systematic biopsies have low mortality. However, monitoring sometimes misses significant cancer progression and causes patient morbidity. The objective of this study is to evaluate a new proposed protocol for AS using the combination of the Stockholm3 test and MRI targeted biopsies in comparison to conventional follow-up using PSA and systematic biopsies. **Methods:** A prospective multicenter study with paired design was used to evaluate our proposed protocol (Stockholm3, MRI, targeted biopsies) compared with the conventional protocol according to Swedish National Guidelines (PSA, systematic biopsies) for follow-up of men on AS. The STHLM3 study was performed between 2012-2014. In the study 1 374 men were diagnosed with ISUP grade 1 disease. Out of these, 541 men currently on AS were invited to the STHLM3AS study. Eligible individuals had to be alive without any severe comorbidity, without contraindications for MRI and without a history of initiating prostate cancer treatment. The primary endpoint ISUP grade $\geq$2 cancer and the secondary endpoint number of performed biopsies will be evaluated using relative sensitivity (RS). At baseline a blood test for PSA and Stockholm3 test as well as a bi-parametric MRI was performed. For men with PIRADS $\geq$ 3 targeted and systematic biopsies were performed. For men with PIRADS $<$ 3 only systematic biopsies were performed. The study is registered at ClinicalTrials.gov (NCTNCT03956108). **Results:** 301 men on AS have been included in the study. Since this is a trial in progress, no results will be presented. **Conclusions:** To our knowledge, this is the largest prospective multicenter study evaluating the performance of MRI for disease monitoring in an AS-cohort. Prediction models using biomarkers and MRI will likely both have an increasing role in the monitoring of AS patients in the future. We hypothesise that the sequential use of first Stockholm3 test followed by MRI will decrease the number of biopsies, while retaining the sensitivity to detect ISUP grade $\geq$2 cancer compared with using systematic biopsies in all men. Clinical trial information: NCTNCT03956108. Research Sponsor: Stockholm County Council, Sweden.

TPS380 **Trials in Progress Poster Session (Board #P22), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Intraoperative application of platelet-rich plasma to the neurovascular bundles during radical prostatectomy: A prospective clinical trial.

Vidhu B. Joshi, Tristan Juvet, Paige E. Nichols, Stephen A. Boorjian, Jeffrey Karnes, Matthew K. Tollefson, Matthew Gettman; Mayo Clinic, Rochester, MN; Mayo Clinic Rochester, Rochester, MN

Background: Radical prostatectomy (RP) is the most common surgical treatment for prostate cancer (PC). Yet even with nerve-sparing RP (NS-RP), a significant proportion of men experience transient or permanent erectile dysfunction (ED) partially due to intraoperative neurovascular bundle (NVB) damage from thermal or mechanical trauma. Studies have shown that platelet released growth factors counteract trauma and facilitate healing. We evaluate the use of platelet rich plasma (PRP) to facilitate early nerve healing and decrease ED after NS-RP. **Methods:** A prospective, open label, 20 subject human trial evaluating intraoperative topical NVB PRP application was approved by the IRB and FDA under an Investigational Device Exemption (IDE 16915) for the investigational use of an approved blood separation device. Men aged 50-60 with newly diagnosed, localized PC and normal preoperative sexual and urinary function, defined as a Sexual Health Inventory for Men (SHIM) score of >19 and an answer of "none" on question 5 of the Expanded Prostate Cancer Index Composite (EPIC) are eligible. Intraoperatively, a 10ml PRP product is created from a 180 mL sample of the patient's whole blood using the Angel Concentrated Platelet Rich Plasma System (Cytomedix, Inc., Gaithersburg, MD USA). PRP is applied via mechanical transfer to the NVB after completion of the vesicourethral anastomosis. The primary endpoint is the safety and tolerability of PRP on the NVB after NS-RP. Secondary endpoints include feasibility of intraoperative PRP application and longitudinal assessment of erectile function and urinary continence by questionnaire administration at 3, 6, 9, 12 and 18 months after NS-RP. Clinical trial information: NCT02957149. Research Sponsor: None.

TPS381 **Trials in Progress Poster Session (Board #Q1), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

Prostate oncologic therapy while ensuring neurovascular conservation (POTEN-C): A phase II randomized controlled trial of stereotactic ablative body radiotherapy (SAbR) with or without neurovascular sparing for erectile function preservation in localized prostate cancer.

Neil Bipinchandra Desai, Michael Ryan Folkert, Andrew Leiker, Yulong Yan, Daniel N. Costa, Robert Timothy Dess, Daniel Eidelberg Spratt, Aurelie Garant, Raquibul Hannan, Robert D. Timmerman; UT Southwestern, Dallas, TX; UT Southwestern Medical Center, Dallas, TX; UT-Southwestern, Dallas, TX; University of Michigan, Ann Arbor, MI; Memorial Sloan Kettering Cancer Center, New York, NY; University of Texas Southwestern Medical Center, Dallas, TX

Background: Radiotherapy (RT) associated sexual dysfunction occurs in half of men following treatment for localized prostate cancer. Proposed mechanisms include vascular injury of adjacent internal pudendal arteries (IPA), penile bulb (PB), corpora cavernosa (CC) or neurovascular bundles (NVB). Ability to spare these structures has been limited by a presumed need to treat the entire prostate gland, while also preventing rectal injury. Recent innovations have challenged this issue: a) precise dose delivery with stereotactic ablative RT (SAbR), b) improved spatial mapping of clinically significant disease with mpMRI, c) rectal avoidance with rectal spacer use. **Methods:** POTEN-C is a multi-center phase II randomized control trial, which includes men with a) low-intermediate risk prostate cancer eligible for SAbR without ADT, b) potent by sexual composite score $\geq$60 on EPIC patient-reported quality of life instrument, c) mpMRI delineated disease (PIRADS v2 score 3-5) $\geq$5mm to at least one 'spared' NVB. After placement of rectal spacer gel and CT/MRI simulation, men are randomized to standard SAbR to 40-45Gy/5fx or neurovascular-sparing SAbR. In the sparing experimental arm, the prostate PTV is given 30Gy/5fx excluding unilateral 'spared' NVB, while a 40-45Gy PTV further excludes a 5mm protective shell on the unilateral 'spared' NVB+IPA+PB+CC. Centralized rapid review of initial contours/plans and online training materials are integrated. The primary endpoint is 2-year patient-reported potency, measured by EPIC sexual composite score. We hypothesize that neurovascular sparing SAbR will reduce 2-year EPIC score decline from a control of 20 to 10 (corresponding to a MCID). Assuming standard deviation 20, two-sided significance level 0.10 with two-sample t-testing, and 15% attrition, we intend to enroll 120 patients to provide 80% power to detect this difference. Secondary endpoints include sexual medication/aid use, relapse rates, GU/GI toxicity. Enrollment is ongoing. Details: http://www.poten-c.org. Clinical trial information: 03525262. Research Sponsor: Boston Scientific.

TPS382 **Trials in Progress Poster Session (Board #Q2), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

A phase Ib/II trial of perioperative intratumoral MVA-BN-brachyury (MVA) plus systemic PROSTVAC and atezolizumab (Atezo) for intermediate-risk and high-risk localized prostate cancer (AtezoVax).

Benjamin Louis Maughan, Alejandro Sanchez, Brock B. O'Neil, William Thomas Lowrance, Christopher B. Dechet, Daniel Joseph Albertson, Deepika Sirohi, Sumati Gupta, Umang Swami, Neeraj Agarwal; Huntsman Cancer Institute at the University of Utah, Salt Lake City, UT; Huntsman Cancer Institute, University of Utah, Salt Lake City, UT; University of Utah Hunstman Cancer Institute, Salt Lake City, UT; University of Utah Huntsman Cancer Institute, Salt Lake City, UT; University of Utah and ARUP Laboratories, Salt Lake City, UT; Huntsman Cancer Institute-University of Utah Health Care, Salt Lake City, UT

Background: Many patients with intermediate or high-risk localized prostate cancer relapse after prostatectomy, identifying an unmet need. Cancer vaccines increase the infiltrating lymphocyte concentration in localized and metastatic prostate cancer (PMID 25255802, 29858218). We hypothesize that treatment with a combination of two vaccines plus PD-L1 inhibition will be safe and significantly stimulate immune infiltration within the tumor microenvironment. MVA is a modified vaccinia virus that is replication-deficient, inducing the generation of tumor antigen-specific killer T-cells. PROSTVAC is a poxviral based cancer vaccine using a vaccinia virus prime and fowlpox based boost along with co-stimulatory molecules B7.1, leukocyte function-associated antigen-3, and intercellular adhesion molecule-1. **Methods:** This study is a single-arm,, phase I/II investigator initiated trial (NCT04020094). Primary objectives: 1) Safety, 2) Quantitative change in infiltrating CD8+ lymphocytes between the biopsy and prostatectomy as measured by immunofluorescence. Secondary endpoints: 1) 6- and 12-month undetectable PSA rate; 2) PSA-PFS compared to institutional historic control. Inclusion criteria: unfavorable intermediate to very high-risk prostate adenocarcinoma (per NCCN). Exclusion criteria: non-adenocarcinoma histology and metastatic disease (including regional nodal metastasis). A total of 22 patients will be enrolled starting with a 6 patient safety lead in. Prostate MRI will be obtained prior to treatment. Treatment schema: 2 neoadjuvant cycles (Atezo + MVA + PROSTVAC), followed by prostatectomy then 6 additional adjuvant cycles (Atezo + PROSTVAC). Neoadjuvant cycle 1: atezolizumab (1200mg IV Q3wks), PROSTVAC-V (Prime, $2x10^8$ Inf.U subcutaneous), MVA (2×10^8 Inf.U/0.5 ml, intra-tumoral injection, volume determined by MRI). Neoadjuvant cycle 2: atezolizumab, PROSTVAC-F (Boost, $1x10^9$ Inf.U, subcutaneous), MVA. Adjuvant: atezolizumab and PROSTVAC-F. Clinical trial information: NCT04020094. Research Sponsor: Bavarian-Nordic and Genetech/Roche.

TPS383 **Trials in Progress Poster Session (Board #Q3), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

PROTEUS: A randomized, double-blind, placebo (PBO)-controlled, phase III trial of apalutamide (APA) plus androgen deprivation therapy (ADT) versus PBO plus ADT prior to radical prostatectomy (RP) in patients with localized high-risk or locally advanced prostate cancer (PC).

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Background: Patients (pts) with localized high-risk PC have disease progression rates of ~50% after RP (Kane et al. *J Urol*. 2007). Neoadjuvant studies show that androgen blockade can improve local disease control at the time of RP (McKay et al. *Prostate Cancer Prostatic Dis*. 2017; Taplin et al. *JCO*. 2014; Efstathiou et al. *Eur Urol*. 2019). This study will determine if treatment with APA + ADT before RP in pts with localized high-risk or locally advanced PC improves pathologic complete response (pCR) rate and if neoadjuvant and adjuvant peri-operative treatment with APA + ADT improves metastasis-free survival (MFS) compared with PBO + ADT. **Methods:** This international multicenter trial is enrolling candidates for RP with localized high-risk or locally advanced PC. Eligibility criteria: any combination of Gleason score (GS) 4 + 3 (= Grade Group [GG] 3) and GS 8 (4 + 4 or 5 + 3) from ≥ 6 systematic biopsy cores (SB) or targeted biopsy cores (TB) (with ≥ 1 core GS 8 [4 + 4 or 5 + 3] included); any combination of GS 4 + 3 (= GG 3) and GS 8 (4 + 4 or 5 + 3) from ≥ 3 SB or TB (with ≥ 1 core GS 8 [4 + 4 or 5 + 3]) included and prostate-specific antigen (PSA) ≥ 20 ng/mL; GS ≥ 9 (GG 5) in ≥ 1 SB or TB; or ≥ 2 SB or TB with continuous GS ≥ 8 (GG 4), each with ≥ 80% involvement. Stratification: GS (7 or ≥ 8), cN0 or N1, and region. Randomization: 1:1 to APA (240 mg) + ADT or PBO + ADT. Pts will receive 6 months neoadjuvant treatment and RP + 6 months adjuvant treatment. Dual primary end points: pCR rate (assessed by blinded independent central pathology review) and MFS (assessed by blinded independent central radiology review). Secondary end points: PSA-free survival and progression-free survival. Imaging with CT or MRI and bone scan at screening, after RP, and then every 6 months following biochemical failure until documented distant metastasis, or death. ~1500 pts will be enrolled globally over 3 years at 240 sites in 19 countries. An independent data monitoring committee is commissioned to review trial data. Clinical trial information: NCT03767244. Research Sponsor: Janssen Research & Development.

TPS384 **Trials in Progress Poster Session (Board #Q4), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

INTREPId (INTermediate Risk Erection PreservatIon Trial): A randomized trial of radiation therapy and darolutamide for prostate cancer.

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Background: Men with intermediate risk prostate cancer are often recommended external beam radiation therapy (EBRT) with or without 4-6 months of androgen deprivation therapy (ADT). However, ADT can be associated with prolonged erectile dysfunction due to delayed testosterone recovery. Darolutamide is a second-generation androgen receptor with low blood-brain barrier penetration. We hypothesize that men who receive Darolutamide with RT rather than ADT with RT are able to achieve surrogate PSA endpoints indicative of long-term disease control while preserving erectile function. **Methods:** This is an open label, phase 2B, multi-center, randomized controlled trial. Eligibility criteria include intermediate risk prostate cancer, good erectile quality per the EPIC-26 questionnaire, and archival tissue suitable for submission to Decipher Biosciences (San Diego, CA). Men will be stratified by Decipher score (low/intermediate vs high), RT modality (EBRT vs Brachytherapy/stereotactic body radiation therapy/combination RT), and age (>65 vs <65). Men with a Decipher high score will be strongly encouraged to undergo extreme RT dose-escalation. The primary endpoint is PSA nadir ≤ 0.5 within 6 months from end of treatment (EOT). The hierarchical endpoint is maintenance of good erectile quality at 3 months from EOT. The key secondary endpoint is interval to PSA failure at 3 years from EOT. Endpoints will be analyzed in a fixed-sequence hierarchical method. 220 patients will be accrued over 3 years. Non-inferiority margins for the primary and key secondary endpoints are 9% (90% power) and 4.9% (80% power), respectively. Men will be randomized to 6 months of GnRH agonist plus bicalutamide 50 mg daily with RT or 6 months of darolutamide 600 mg twice daily with RT. Assessments will occur at baseline, during treatment, EOT, and at regularly scheduled intervals up to 36 months from EOT. Correlative endpoints include discovering transcriptomic and radiomic predictors of response. Clinical trial information: NCT04025372. Research Sponsor: Bayer HealthCare Pharmaceuticals Inc.

TPS385 **Trials in Progress Poster Session (Board #Q5), Thu, 11:30 AM-1:00 PM and 5:30 PM-6:30 PM**

DASL-HiCAP (ANZUP1801): The impact of darolutamide on standard therapy for localized very high-risk cancer of the prostate—A randomized phase III double-blind, placebo-controlled trial of adding darolutamide to androgen deprivation therapy and definitive or salvage radiation in very high-risk, clinically localized prostate cancer.

Tamim Niazi, Scott Williams, Ian D. Davis, Martin R. Stockler, Andrew James Martin, Wendy Hague, Karen Bracken, Margot Gorzeman, Felicia Roncolato, Sonia Yip, Lisa Horvath, Shomik Sengupta, Simon Hughes, Raymond S. McDermott, James WF Catto, Neha Vapiwala, Wendy R. Parulekar, Christopher Sweeney; Jewish General Hospital, McGill University, Montreal, QC, Canada; Peter MacCallum Cancer Centre, Melbourne, Australia; Monash University Eastern Health Clinical School, Melbourne, Australia; NHMRC Clinical Trials Centre, The University of Sydney, Sydney, Australia; NHMRC Clinical Trials Centre, University of Sydney, Sydney, Australia; Macarthur Cancer Therapy Centre, Sydney, Australia; Sydney Catalyst Translational Cancer Research Centre, Sydney, Australia; Sydney Cancer Centre, Sydney, Australia; Olivia Newton-John Cancer Wellness and Research Centre, Melbourne, Australia; Guy's Cancer, Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom; Adelaide and Meath Hospital (Incorporating the National Children's Hospital), Dublin, Ireland; Academic Urology Unit, University of Sheffield, Sheffield, United Kingdom; University of Pennsylvania, Philadelphia, PA; Canadian Cancer Trials Group, Kingston, ON, Canada; Lank Center for Genitourinary Oncology, Dana-Farber Cancer Institute, Boston, MA

Background: Radiation therapy (RT), plus androgen deprivation therapy (ADT) with a luteinising hormone releasing hormone analogue (LHRHA) for at least one year, is standard of care for men with very high-risk localised prostate cancer (PC), or with very high-risk features and persistent PSA after radical prostatectomy (RP). Despite this, incurable distant metastases develop within 5 years in 15% of men with very high risk features. Darolutamide is an androgen receptor antagonist with favourable tolerability. Our aim is to determine the efficacy of adding darolutamide to ADT and RT given in the setting of either primary definitive therapy (RP or RT), or adjuvant therapy for very high-risk PC. **Methods:** This study is a randomised (1:1) phase III placebo-controlled, double-blind trial for men planned for RT who have very high-risk localised PC, or very high-risk features with PSA persistence or rise within one year following RP. The trial will be stratified by: use of adjuvant docetaxel; pelvic nodal involvement; RP. 1100 participants will be randomised to darolutamide 600 mg or placebo twice daily for 96 weeks. Participants will receive LHRHA for 96 weeks, plus RT starting week 8-24 from randomisation. Participants are allowed nonsteroidal antiandrogen (up to 90 days) in addition to LHRHA up until randomisation. Early treatment with 6 cycles of docetaxel completed at least 4 weeks prior to RT is permitted. The primary endpoint is metastasis-free survival, with secondary endpoints overall survival, PC-specific survival, PSA-progression free survival, time to subsequent hormonal therapy, time to castration-resistance, frequency and severity of adverse events, health related quality of life, fear of recurrence. Tertiary endpoints include incremental cost-effectiveness, and identification of prognostic and/or predictive biomarkers of treatment response, safety and resistance to study treatment. Clinical trial information: NCT04136353. Research Sponsor: Bayer.