Poster Session 7: Prostate Cancer (2)
June 28, 2016 0730-0900

MP-07.01
Rapid prediction of personalized response to chemotherapy using sub-millimeter ex-vivo biopsy samples on chip

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Introduction and Objectives: Evaluating prostate cancer response to therapy can often take three months and decisions should not be made before that time according to Prostate Cancer Clinical Trials Working Group (PCWG)-2 recommendations. Early response predictor identification is a major objective towards personalized medicine. The emergence of microfluidic devices has allowed for ex-vivo response measurement to a given therapy in 3D tumour tissue. We have optimized a method to obtain microdissected tissues (MDTs) from patient biopsies, with a viability that is maintained for 14 days. Using a microfluidic, on-chip system, we studied the ex-vivo response of the MDTs to a given chemotherapeutic drug by flow cytometry.
Methods: We have developed a method to precisely section biopsies into MDTs of sub-millimeter size. We have also designed a microfluidic chip, capable of trapping 25 MDTs, in which they can be exposed to different drugs. With our novel approach, we have initiated drug testing on patient samples using different combinations of docetaxel alone (100 nM) or in combination with bicalutamide (1 mM). The treatment regimen was initiated after 24-48 hours of tissue recovery, post-surgery. The following cycles of treatment was performed on chip: first treatment for 24 hours, first recovery for 48 hours, second treatment for 24 hpurs, second recovery for 48 hours, then cell viability analysis.
Results: After 24 hours in culture, we observed more than 85% viability of MDTs. We observed a variable response in individual patient samples treated with per protocol on chip (<65-100% survival). For each patient included in our study, we predicted a personalized potential drug response profile based on the ex- vivo response to tested drugs. We are presently comparing these profiles to the clinical response to ongoing therapy in these patients.
Conclusions: The ex-vivo drug response of MDTs from patient biopsy samples on-chip can be performed in a time-effective manner and may eventually contribute to a more personalized approach to clinical decision-making.

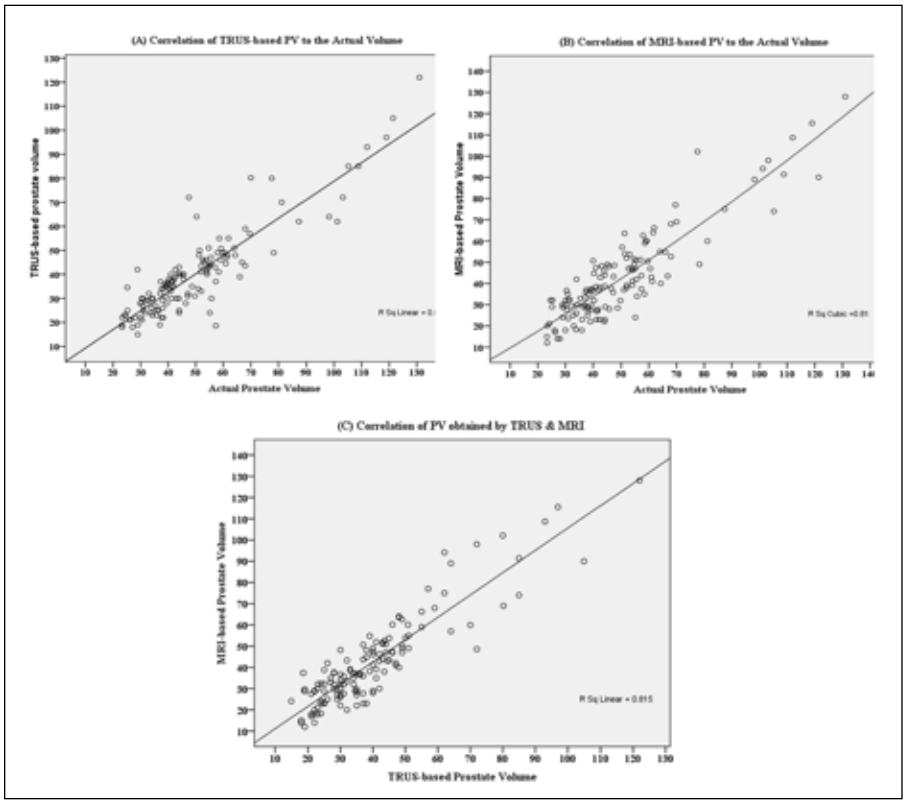

Fig. 1. MP-07.02. Correlation of PV obtained by ***(A)*** TRUS and ***(B)*** MRI to the actual volume and to each other ***(C)***.

MP-07.02
Prostate stereometry by transrectal ultrasonography and magnetic resonance imaging is significantly correlated to the actual volume measured after radical prostatectomy

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Introduction and Objectives: To compare prostate volumes obtained by transrectal ultrasonography (TRUS) and magnetic resonance imaging (MRI) to assess the reliability of both techniques in predicting the actual volume.
Methods: Data of 825 prostate cancer (PCa) patients who underwent radical prostatectomy between October 2010 and May 2014 was reviewed. A total of 134 had both preoperative TRUS and MRI for prostate evaluation and fulfilled the inclusion criteria. Prostate volume (PV) measured by TRUS and MRI were compared to the actual volume reported after surgery. Prostate size was estimated using the prolate ellipsoid formula (height x width x length xϖ/6); with the antero-posterior (A-P) diameter measured using a mid-sagittal view for TRUS and an axial view for MRI. Also, the relation of PV estimates to clinic-pathological parameters of PCa

Table 1. MP-07.02. Correlation of PV to other clinic-pathological parameters in PCa patients

		TRUS	MRI	Actual	PSA	Gleason	Stage	RISK	Surgery
TRUS	Pearson correlation	N/A	0.903**	0.898**	0.097	0.102	0.090	0.035	-0.206*
	Sig. (2-tailed)		0.000	0.000	0.267	0.240	0.301	0.684	0.017
MRI	Pearson correlation	0.903**	N/A	0.899**	0.091	0.092	0.063	0.025	-0.158*
	Sig. (2-tailed)	0.000		0.000	0.295	0.288	0.471	0.777	0.068
Actual	Pearson correlation	0.898**	0.899**	N/A	0.063	0.100	0.141	0.078	-0.179*
	Sig. (2-tailed)	0.000	0.000		0.471	0.253	0.104	0.371	0.038
PSA	Pearson correlation	0.097	0.091	0.063	N/A	0.355**	0.399**	0.439**	0.310**
	Sig. (2-tailed)	0.267	0.295	0.471		0.000	0.000	0.000	0.000
Gleason	Pearson correlation	0.102	0.092	0.100	0.355**	N/A	0.401**	0.454**	-0.334**
	Sig. (2-tailed)	0.240	0.288	0.253	0.000		0.000	0.000	0.000
Stage	Pearson correlation	0.090	0.063	0.141	0.399**	0.401**	N/A	0.861**	-0.230**
	Sig. (2-tailed)	0.301	0.471	0.104	0.000	0.000		0.000	0.007
RISK	Pearson correlation	0.035	0.025	0.078	0.439**	0.454**	0.861**	N/A	-0.286**
	Sig. (2-tailed)	0.684	0.777	0.371	0.000	0.000	0.000		0.000
Surgery	Pearson correlation	-0.206*	-0.158*	-0.179*	-0.310**	-0.334**	-0.230**	-0.286**	N/A
	Sig. (2-tailed)	0.017	0.068	0.038	0.000	0.000	0.007	0.001	

* Correlation is significant at the 0.1 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

was assessed. Pearson's correlation, linear regression, and paired t-test were performed to compare PV estimated via both imaging modalities.
Results: The mean PV was 39.9 ± 18.3, 42.5 ± 21.3, and 49.7 ± 21.3 for TRUS, MRI, and the actual volume, respectively. The average TRUS- and MRI-based PV was significantly correlated to and underestimated the actual volume (R=0.898; p<0.001 and R=0.899; p<0.001, respectively) and to each other (R=0.903; p<0.001). Stratifying our cohort into three groups using 30 and 60 ml actual volume as cutoff points, both techniques remained correlating to the actual volume and to each other and were underestimating the PV, which was only significant in the large prostate group. Also, neither preoperative estimates, nor the actual volume was correlated to any of clinic-pathological parameters in our patients.
Conclusions: PV estimations by TRUS and MRI are highly correlated to the actual volume. So, in the hands of an experienced sonographer, TRUS is not only efficient and economic, but also an accurate and reproducible modality to estimate prostate size.

MP-07.03

An update on hospital admission rates for urological complications after transrectal ultrasound-guided prostate biopsy

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Introduction and Objectives: We were the first to report in 2010 rising rates of complications following transrectal ultrasound (TRUS)-guided prostate biopsy for prostate cancer detection from 1996-2005. Many centres have since confirmed these findings. We conducted a followup study from 2006 to 2013 to further examine these rates.
Methods: This was a retrospective, population-based study of men who underwent TRUS-guided prostate biopsy in Ontario, Canada between January 1, 2006 and December 31, 2013. Using the Canadian Institute of Health Information (CIHI) Registry, provincial fee codes, and the Ontario Cancer Care Registry, we were able to determine mortality rates and hospital admission rates within 30 days post-TRUS prostate biopsy for hematuria, urinary obstruction, and genitourinary infection.
Results: In total, 61 910 men underwent a TRUS-guided prostate biopsy from 2006-2013. The overall mortality rate was 0.08% and did not change throughout the study. We focused only on the healthy men (30 996/61 910) with no cancer from biopsy. The 30-day hospital admission rate was 3.45% for men without prostate cancer. Among them, 76.5% (1128/1460) men were admitted due to infection. The rates of 30-day hospital admission due to infection did not significantly increase from 2006-2013 (p=0.74). The adjusted odds ratio for admission for infection was 1.21 (95% CI 0.38-3.89) for patients from 2013, compared to patients in 2006. The number of TRUS biopsies performed annually remained stable and then abruptly fell by 30.6% in 2013 compared to the average annual biopsy rate. The rate of hospital admission in 2013, however, remained the same at 4.1% (compared to 4.0% in 2006).
Conclusions: The 30-day post-TRUS biopsy hospital admission rates remained stable for the duration of the study. Interestingly, we witnessed an abrupt drop in biopsy rates in 2013, which could be due to the recent U.S. Preventative Services Task Force (USPSTF) recommendation against PSA screening.

MP-07.04

Initial Canadian experience with 18 F fluoromethylcholine positron emission tomography/computed tomography in biochemical recurrence after definitive treatment of prostate cancer

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Introduction and Objectives: To correlate 18 F fluoromethylcholine positron emission tomography/computed tomography (18F-FCH PET/CT) results with patient characteristics and other conventional imaging modalities and to determine factors predictive of positivity.
Methods: Retrospective study including 44 18F-FCH PET/CT scans of patients with (biochemical recurrence (BCR) after initial radical prostatectomy (RP) or radiation therapy (RT). Results were compared to findings on magnetic resonance imaging (MRI), CT, bone scan (BS), and histological analysis when available. Univariate and multivariate analysis were performed to correlate results with qualitative and quantitative patient characteristics (age, trigger prostate-specific antigen (PSA), doubling time (PSADT), T/N stage, Gleason score, initial/salvage treatment, concomitant androgen-deprivation therapy).
Results: 26 PET scans (59%) were positive, 14 negative (32%), three equivocal (7%), and one non-diagnostic (2%). Of the positive PET scans, 11 demonstrated local recurrence (10 in patients with initial treatment consisting of RT and one for RP), 11 regional/distant lymph nodes (10 RP, one RT), two bone metastasis and two LN + bone metastasis. Among

the 26 positive PET scans, 15 underwent conventional imaging (CT, BS, and/or pelvic MRI), of which it was negative in three patients. The age (p=0.003), trigger PSA (p=0.03), PSA velocity (p=0.04), and PSADT (p=0.046) were significantly different when comparing positive and negative PET scans. Using univariate log regression analysis, patients with positive PET scans were significantly more likely to have had RT initially (OR 6.0, 95% CI 1.1-32.3) and a trigger PSA level higher than 2 ng/mL (OR 15.3, 95% CI 2.6-91.9). Trigger PSA of 2.6 ng/mL and PSADT of 4.3 months had the optimal capacity to differentiate between positive and negative scans (sensitivity 86% and 79%, specificity 71% and 50%, respectively; ROC curves).
Conclusions: 18 F-FCH PET/CT demonstrates high detection rate for local, lymph node and bone metastases in BCR patients. A trigger PSA above 2.6 ng/mL seems optimal for appropriate patient selection.

MP-07.05

Anatomic location of positive margins vary between surgeons during robotic radical prostatectomy

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Introduction and Objectives: Surgical technique is associated with risk of positive tumour margins during radical prostatectomy. The purpose of this study was to determine if the risk of a positive surgical margin at specific anatomic locations varied by surgeon.
Methods: All patients who received a robotic radical prostatectomy at The Ottawa Hospital between October 2011 and September 2015 were reviewed. Patient characteristics, clinical data, and pathological findings were obtained from the medical record. Prostatectomy specimens were reviewed by genitourinary pathologists. The presence of a positive surgical margin was reviewed at four anatomic locations of the prostate: anterior apex, posterior apex, non-apex posterolateral, and bladder neck.
Results: During the study period, 571 patients received a radical prostatectomy by one of six surgeons. The number of procedures per surgeon ranged from 24-185. Median preoperative prostate-specific antigen (PSA) was 6.9 (interquartile range (IQR) 5.0, 9.5) and 250 (43.9%) patients had palpable tumours. Gleason sum was 3 + 3 in 37 (6%), 3 + 4 in 325 (57%), 4 + 3 in 163 (29%), 4 + 4 in 8 (2%), and 4 + 5 in 35 (6%). Almost half of patients had pT3 tumours (259; 45%). There were no statistically significant differences in baseline characteristics between surgeons (p>0.05). Bilateral nerve-spare was performed in 325 (57%), unilateral nerve-spare in 135 (24%) and no nerve-spare in 111 (19%). There were statistically significant differences in positive surgical margins between surgeons at the posterior apex (range 5-27%; p<0.0001) and the bladder neck (range 0-7.4%; p=0.03). There was no difference between surgeons for the risk of a positive surgical margin at the anterior apex (36; 6.3%; p=0.9) or the non-apex posterolateral (85; 15%; p=0.9) locations.
Conclusions: Significant variability in the incidence of positive surgical margins between surgeons was observed at the posterior apex and bladder neck. These data suggest that an adjustment in surgical technique may improve oncologic outcomes.

MP-07.06

Baseline prostate-specific antigen levels in midlife predict total and aggressive prostate cancer in African-American men

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Introduction and Objectives: Prostate-specific antigen (PSA) level in midlife predicts prostate cancer (PCa) mortality in Caucasian populations. It is poorly studied whether PSA measured during midlife predicts aggressive PCa among African-American (AA) men.
Methods: We performed a nested case-control study among AA men age 40-65 years who gave blood at enrollment in the Southern Community Cohort Study between 2002 and 2009 and followed for median of nine years. Baseline kallikrein levels (total PSA, free PSA, intact PSA, and human kallikrein 2[hK2]) were measured in 197 PCa cases and 569 age-matched controls. 55 men had aggressive PCa defined as Gleason 4 + 3 = 7, AJCC Stage III or IV, or cancer-specific death. Exact conditional logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for association between PSA and risk of total/aggressive PCa. Area under the curve (AUC) for prediction of total/aggressive PCa by PSA and a previously reported four-kallikrein risk score was calculated using logistic regression.
Results: Median PSA among controls was 0.72, 0.80, 0.94, and 1.03 ng/mL for men 40-49, 50-54, 55-59, and 60-64 years, respectively. Risk of total PCa was strongly associated with baseline PSA in midlife. PSA was also highly predictive of aggressive PCa. All 22 aggressive cases in men <55 years occurred among those with PSA above the age-specific median; among men 40-49 years, all nine cases of aggressive PCa were among those with PSA >90th percentile. Across age groups, the OR of aggressive PCa for PSA >90th percentile vs. < median was 38.8 (95% CI 10.0-237), using age-specific cut-points. PSA in midlife predicted total (AUC 0.88, 95% CI 0.85-0.91) and aggressive (AUC 0.87, 95% CI 0.81-0.92) PCa with high discrimination. Among men with total PSA >2 ng/ml, the four-kallikrein risk score improved prediction of aggressive PCa compared to PSA alone.
Conclusions: PSA level in midlife strongly predicted total and aggressive PCa in a cohort of AA men subject to opportunistic screening.

MP-07.07

Inhibiting invadopodia formation can abrogate cancer cell extravasation and prevent prostate cancer metastasis

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Introduction and Objectives: Inhibition of Tks4 and Tks5 expression can block invadopodia formation in metastatic cancer cells, leading to the inability of these cells to undergo extravasation. We sought to determine if this was also the case in metastatic prostate cancer cells.
Methods: We used PC3MLN4 and LNCAP prostate cancer cell lines. Lentiviral infection was performed to knockdown four clones each for Tks4 and Tks 5 for both the cell lines. Gene knock-down efficiency was assessed by quantitatve reverse transcription polymerase chain reaction (qRT-PCR). Using CAM-model, we then assessed the extravasation efficiency of these cells (labeled with green fluorescent protein) using confocal microscopy.
Results: Using PC-3M-LN4 and LNCaP metastatic prostate cancer cells, we knocked down Tks4 and Tks5 mRNA levels with RNAi to 64% and 78% of control levels respectively. In our model of in vivo cancer cell extravasation, we determined that extravasation rates dropped to 12+/-3% and 3.4+/-1.6% compared to 37.3+/-5.8% in empty vector controls with the PC-3M-LN4 cell line. When the same cells were used to understand the impact on metastatic colony formation, 12.3+/-4.6 and 0.4+/-1.2 colonies were observed (n>8/group) for shTks4 and shTks5 PC-3M-LN4 cells compared to 47+/-9 in shLUC control cells. However, when in vitro gelatin-Alexa594 ECM degradation assays were performed, no degradation signal voids were observed in any of the cell lines including the controls. Instead, we performed intravital imaging experiments to determine the incidence of cell protrusions at t=5 hours post-injection, revealing few to no cells forming protrusions in vivo, whereas the control cells formed protrusions in 10% of cells at that time point.
Conclusions: Blocking the expression of Tks4/5 in prostate cancer cells abrogated cancer cell extravasation leading to no metastatic colonies

formed in vivo. These findings suggest that targeting key steps of the metastatic cascade may be a realistic approach for advanced prostate cancer treatment.

MP-07.08

Treatment trends and cost for localized prostate cancer in elderly patients

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Introduction and Objectives: The absolute and proportional numbers of elderly patients diagnosed with localized prostate cancer (PCa) are on the rise. We examined treatment trends and reimbursement figures in localized PCa patients aged 80 years and more.

Methods: Between 2000 and 2008, we identified 30 217 localized PCa patients aged 80 years and more in Surveillance Epidemiology and End Results (SEER)-Medicare-linked database. Alternative treatment modalities consisted of conservative management (CM), radiation therapy (RT), radical prostatectomy (RP), and primary androgen-deprivation therapy (PADT). For all four modalities, use and cost trends were examined.

Results: PADT was the most frequently used treatment modality between 2000 and 2005 in elderly patients. CM became the dominant treatment modality from 2005 to 2008. RP rates were marginal and RT ranked third. RT annual utilization rate increased from 20.77% in 2000 to 29.13% in 2008. The highest median individual cost was related to RT, ranging from $29 343 in 2000 to $31 090 in 2008, followed by RP (from $20 560 in 2000 to $19 580 in 2008), PADT (from $18 901 in 2000 to $8000 in 2008), and CM (from $1 824 in 2000 to $1938 in 2008). RT contributed to most of cumulative cost from 2003 (49.24%) to 2008 (72.97%). PADT share of cost ranked first from 2000 (54.56%) to 2002 (50.49%), but decreased by 19.40% in 2008. CMs contribution to cumulative cost increased from 4.42% in 2000 to 6.96% in 2008. RP share of cost was stable during the study period.

Conclusions: Our results, focusing on localized PCa treatment in patients aged 80 years and more, showed an important increase in rates, median cost, and proportion of cumulative cost related to RT. Moreover, a surprising elevated proportion of elderly patients received RT.

MP-07.09

Focal high-intensity focused ultrasound for localized prostate cancer: A single-centre experience

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Introduction and Objectives: Men with localized prostate cancer (PCa) are currently faced with the decision to either undergo radical therapy or enter active surveillance protocol. Focal high-intensity focused ultrasound (HIFU) may be an alternative treatment option for some of these men that may be spared the side effects of radical prostatectomy and radiation or released from anxiety of living with untreated cancer in active surveillance protocol. The objective of this study is to present preliminary outcomes in selected patients treated with focal HIFU.

Methods: We report preliminary findings of a prospective, single-centre, phase 2, single-arm, cohort study offering focal HIFU (Ablaterm®/Focal One®) to men with histologically proven localized, low-to-intermediate-risk PCa (prostate-specific antigen (PSA) <15, Gleason score (GS) ≤7) with a magnetic resonance imaging (MRI) index lesion confirmed by MR-targeted transrectal ultrasound (TRUS) biopsies. Factors assessed included PSA levels, control MR-targeted TRUS biopsy at six months post-HIFU, oncologic results, re-treatments, side effects, and validated questionnaires assessing urinary and bowel function, sexuality, and quality of life.

Results: A total of 21 patients have been recruited from September 2013 to January 2016, 14 of whom had control MRI-guided biopsy at six months. The mean followup is 9.9 months. In the group of patients with six-month control biopsy, the mean initial PSA was 6.9 ng/ml (standard deviation (SD) 2.8) and mean six-month PSA 3.2 ng/ml (SD 3.2). The mean prostate volume was 35.6 cc (SD 17.3) and the mean percent of volume treated was 41.8% (SD 6.6) of the prostate gland. Nine had negative biopsies (12 cores + targeted biopsies on the treated area) (64.2%). In five patients with positive biopsies, three had cancer in the treated area (considered as failures; 21.4%) and two in a non-treated part of the gland. Four patients have been re-treated, one underwent a radical prostatectomy, one was referred for external beam radiation and hormone therapy, and two underwent repeat focal HIFU with no complication. There have been no serious adverse events Side effects included erectile dysfunction needing phosphodiesterase type-5 inhibitor (IPDE5) in two patients (9.5%), lower urimart tract symptoms (LUTS) in three patients (14.2%), two mild hematuria, one mild rectal bleeding, and one epididymitis.

Conclusions: Focal therapy may be a strategy that could complement the current choices available to men with localized PCa. Our preliminary experience tells us it is a safe procedure, very well-accepted by patients. However, longer followup and larger numbers of patients are needed to confirm our early results. The impact it may have on function and quality of life, in addition to its cost-effectiveness, are currently being assessed.

MP-07.10

ATLAS: A randomized, double-blind, phase 3 study of ARN-509 in patients with high-risk localized or locally advanced prostate cancer receiving primary radiation therapy

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Introduction and Objectives: At present, high-risk localized and locally advanced prostate cancer (PCa) patients receiving primary radiation therapy (RT) and long-term androgen-deprivation therapy (ADT; gonadotropin-releasing hormone [GnRH] agonist +/- antiandrogen) have a high risk of metastases and PCa-specifc death. We hypothesize that the addition of ARN-509 (JNJ 56021927), a selective androgen receptor (AR) antagonist, to GnRH agonist will improve metastasis-free survival in high-risk patients treated with primary RT.

Methods: This is a randomized, multicentre, double-blind, placebo-controlled, phase 3 trial evaluating the efficacy and safety of ARN-509 in patients with high-risk localized or locally advanced PCa (Gleason score of ≥8 and ≥cT2c or a Gleason score of ≥7 and prostate-specific antigen ≥20 ng/mL and ≥cT2c) receiving primary RT. Stratification: Gleason score (7 or ≥ 8), N0 or N1, brachytherapy boost (yes or no), and region (North American,

European Union, or other). All patients will receive active treatment with a GnRH agonist throughout the 30 28-day treatment cycles. Randomization: 1:1 to ARN-509 or control. Neoadjuvant/concurrent (cycles 1-4) to RT (74-80 Gy): ARN-509 240 mg/d vs. bicalutamide 50 mg/d; adjuvant to RT (cycles 5-30): ARN-509 240 mg/d vs. placebo. Primary endpoint: metastasis-free survival. Secondary endpoints: time to local-regional recurrence, time to castration-resistant disease, time to distant metastasis, and overall survival. Imaging with computed tomography (CT) or magnetic resonance imaging (MRI) and bone scan will be conducted at baseline and then every six months following biochemical failure until documented distant metastasis by blinded-to-arm independent central review or death. Approximately 1500 patients will be accrued globally to provide appropriate statistical power to detect the hypothesized risk reduction (25%) in metastasis or death. An independent data monitoring committee is commissioned to review trial data.
ClinicalTrials.gov Identifier: NCT02531516.

MP-07.11 *WITHDRAWN*

MP-07.12

MRI-fused cone beam CT-guided biopsy of the prostate: A novel method of prostate biopsy

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Introduction and Objectives: Real-time 3D fluoroscopy guidance using a cone beam computed tomography (CT) fused to a magnetic resonance imaging (MRI) can project an MRI-detected lesion on to the screen of a cone beam CT scan (Fig. 1). This allows an operator to advance a needle directly into the software-generated lesion using real-time fluoroscopy to confirm biopsy needle placement within the lesion (Fig. 2). To date, there have been no reports or investigations on the use of this new technology for prostate biopsies. We prospectively assessed the safety and feasibility of MRI-fused cone beam CT-guided prostate biopsies.
Methods: We prospectively identified six patients who had either negative transrectal ultrasound of the prostate (TRUSP) biopsies or TRUSP biopsies showing small volume Gleason 6 disease with a clinical suspicion of higher-volume, higher-grade disease. All patients had an MRI showing a prostate imaging reporting and data system (Pi-RADS) 4 or 5 lesion in the prostate. Patients underwent site-directed MRI-fused cone beam CT-guided biopsies through a transgluteal approach. Biopsy results and immediate and 30-day complication rates were recorded.
Results: The biopsies were well-tolerated by all patients. No patient experienced an immediate or 30-day complication. Of the six patients, three had previous negative biopsies and three had biopsies harbouring low-volume Gleason 6 disease. Of the three patients with previous negative biopsies, one patient had a positive CT-guided biopsy with seven of nine cores positive for Gleason 4 + 4 = 8/10. Of the three patients with low-volume Gleason 6 disease, two patients had CT-guided biopsies showing prostate cancer; one patient with similar low-volume Gleason 6 disease and the second patient's CT-guided biopsy showed upgrading with five out of five cores positive for Gleason 3 + 4 = 7/10 prostate cancer.
Conclusions: MRI-fused cone beam CT-guided biopsy of the prostate appears to be technically feasible with a reasonable safety profile. Additional experience will be required to further delineate the diagnostic accuracy of this novel method of prostate biopsy.

MP-07.13

The impact of public awareness campaigns on internet searches for prostate cancer and PSA testing: Comparison to breast and colon cancer

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Introducation and Objectives: Cancer Awareness Months (CAMs) aim to raise awareness and funds for cancer charities and research. The American Cancer Society recognized 12 distinct CAMs. Over 2/3 of people seek health information on the internet. We used internet search volumes to identify changes in relative volume of cancer- and screening-specific searches during CAMs.
Methods: We used Google Trends to identify relative search volumes for prostate, breast, and colon cancer, as well as "PSA test," "mammogram," and "colonoscopy" from 2004-2014. We searched volumes in Canada, the United States (U.S.), Britain (U.K.), and Australia. Google Trends reports search terms as a proportion of all Google searches in the same time period; relative results over time are normalized to values between 0 and 100. We used ANOVA to compare mean search volumes for each month against all other months; the Tukey-Kramer post-hoc test assessed CAMs agains each other month.
Results: Breast cancer search volume was always much higher than that for prostate or colon cancer. Prostate cancer searches are not higher

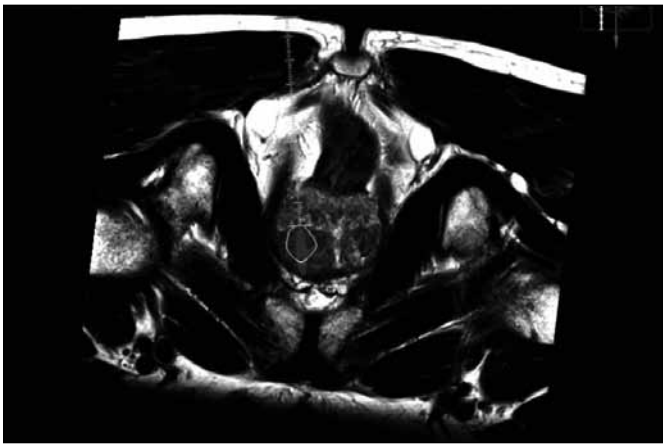

Fig. 1. MP-07.12. Needle guidance planning image with fused image of the patient's MRI lesion projected on to a cone beam CT scan with computer-generated needle tract. Green graduated marker represents the planned needle tract. Orange perimeter indicates the lesion identified on MRI. Magenta elongated oval represents the expected biopsy trajectory through the lesion. (Colour version available online)

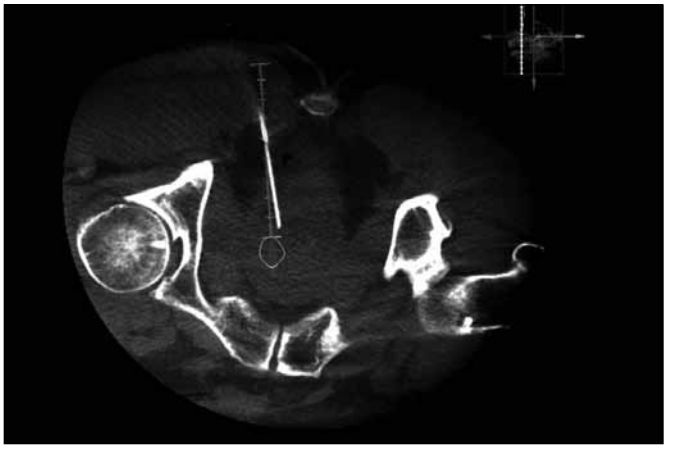

Fig. 2. MP-07.12. Real-time cone beam CT of the same patient as in Fig. 1 with the biopsy needle in place. This image shows the real-time feedback available and the need to reposition the biopsy needle to adequately sample the target lesion.

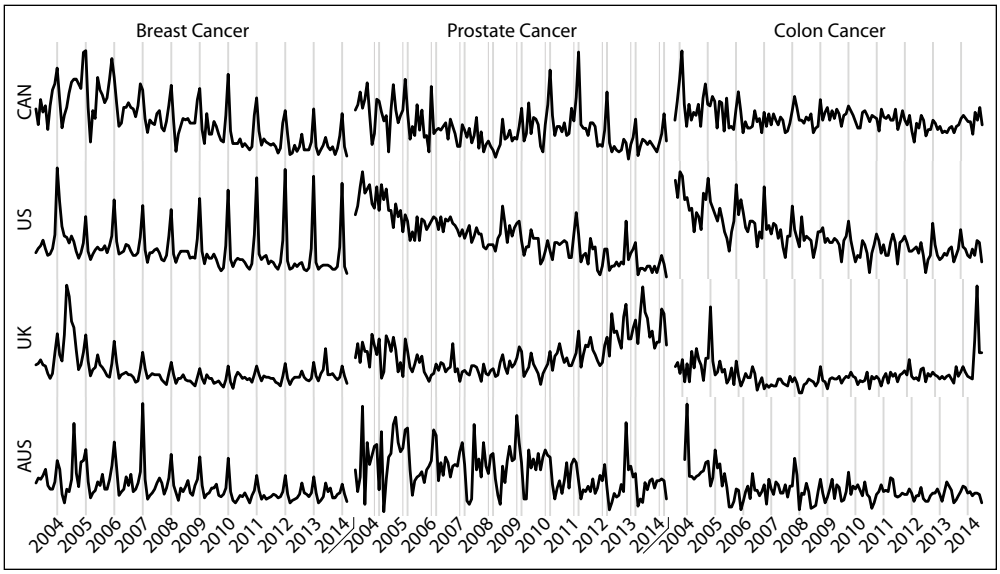

Fig. 1. MP-07.13. Monthly relative search volume (normalized values).

in September (prostate CAM), but yearly peaks are seen in Canada in November, corresponding to the "Movember" campaign. Colon cancer searches peak in March (colon CAM) in the U.S.; breast cancer searches universally peak each October (breast CAM). Data from specific CAMs vs. all other months are presented in Table 1. Among screening tests, only "mammogram" was searched significantly more often in breast CAM in the U.S.

Conclusions: The Movember campaign, but not prostate CAM, appears to have traction in influencing disease-specific internet searches in Canada, but not elsewhere; neither affects searches regarding PSA testing. Breast CAM is universally associated with higher internet search volume for the disease and for mammography in the U.S. Cancer organizations should note these results as an opportunity to reach patients who are already online in significant numbers.

MP-07.14

Paternal family history of prostate cancer among patients undergoing radical prostatectomy across Quebec is associated with better pathologic parameters and greater familial breast cancer

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Introduction and Objectives: Men with a positive family history of prostate cancer (PCa) have a higher risk of developing prostate cancer. Several hereditary diseases have a higher incidence in Quebec due to the "founder effect." The relationship of degrees of familial PCa, clini-

Table 1. MP-07.13.

Country	Awareness month	ANOVA *p* value	Number of months CAM search volume > other months	ANOVA *p* value	Number of months CAM search volume > other months
		Breast cancer		**Mammogram**	
Canada	October	<0.001	11	<0.001	2 (2005-14)
USA	October	<0.001	11	<0.001	11
Australia	October	<0.001	11	0.004	2 (2007-14)
UK	October	<0.001	11	<0.001	7 (2005-14)
		Prostate cancer		**PSA test**	
Canada	September	<0.001	0	0.042	0 (2006-14)
USA	September	<0.001	0	0.006	1
Australia	September	<0.001	3	0.401	0 (2010-14)
UK	September	<0.001	0	0.065	0 (2007-14)
Canada	November	<0.001	9	0.042	0 (2006-14)
USA	November	<0.001	1	0.006	0
Australia	November	<0.001	3	0.401	1 (2020-14)
UK	November	<0.001	4	0.065	0 (2007-14)
		Colon cancer		**Colonoscopy**	
Canada	March	<0.001	0	<0.001	0
USA	March	<0.001	11	<0.001	5
Australia	June	<0.001	0	<0.001	0 (2005-14)
UK	April	0.008	1	0.008	0

copathologic parameters, and outcome is unclear. Our objective was to examine the association of family history in the PROCURE cohort of PC patients with clinicopathologic parameters.
Methods: 1856 PCa patients scheduled for radical prostatectomy in four Quebec teaching hospitals (2007-2012) filled a self-administered and then verified questionnaire as part of enrolment in PROCURE Biobank.
Results: 686 men (36.4%) reported a family history of PCa, including father (n=347), brothers, grandfathers, uncles, and cousins. The 347 patients with paternal PCa (pPCa) were diagnosed at an earlier age compared to no pPCa (61.5 vs. 62.5; p=0.0007). Patients with pPCa had better clinicopathologic parameters: 2.0% vs. 17.4% had a serum prostate specific antigen (PSA) level >10ng/ml, less extraprostatic extension (30.3% vs. 35.7%), and less seminal vesicle invasion (8.6% vs. 11.2%). Patients with pPCa had one or more family members with PCa (41% vs. 22%) and came from a smaller family (three siblings vs. five; p<0.0001). Brothers accounted for 50% of these PCa. Patients with pPCa reported more breast cancer (BrCa) (27.0% vs. 18.4%) in their family. More than 80% had up to two family members with BrCa with more mothers affected (41.1% for pPCa vs. 30.9% for no pPCa). Patients with pPCa who had additional family members with PCa had lower PSA (5.8 vs. 9.3 ng/ml; p=0.033), extraprostatic extension (25.2% vs. 33.8%), seminal vesicle invasion (5.6% vs. 10.8%), and reported more BrCa (32.2% vs. 24.0%).
Conclusions: Paternal family history of PCa in the PROCURE cohort of Quebec men undergoing radical prostatectomy, was associated with better clinicopathologic parameters, and additional family members with PCa and BrCa.

UP-07.01

Differential regulation of mechanistic target of rapamycin pathways in hormone-dependent and independent prostate cancer

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Introduction and Objectives: Mechanistic target of rapamycin (mTOR), which is the downstream target of PI3K/Akt pathway, is a complex central hub for various signaling pathways regulating protein synthesis, cellular differentiation, proliferation, and transformation. In prostate cancer (PCa), alterations in the signaling members of the PI3K/Akt/mTOR pathway have been reported in 42% of primary and 100% of metastatic PCa. The mTOR signaling is often dysregulated in human cancer, including PCa and has been pursued as a therapeutic target. The activation of PI3K/Akt/mTOR pathway has been demonstrated in castration-resistant prostate cancer (CRPC). N-myristoyltransferase (NMT) catalyzes myristoylation of proteins that regulate mitogenic pathways. We previously demonstrated that activation of Akt1 leads to phosphorylation of NMT1, which attenuates its activity. However, the mechanism of regulation of NMT by activated Akt is not known. Therefore, we investigated whether NMT is mediated via mTOR.
Methods: To determine differential alteration in PI3K/Akt/mTOR pathway in hormone-dependent and independent PCa, we treated LNCaP (hormone-dependent), PC3, and Du145 (both hormone-independent) PCa cells with metformin and/or rapamycin. Both metformin and rapamycin inhibit mTOR through different effectors.
Results: We demonstrate high levels of NMT activity in hormone-independent cell lines as compared to our hormone-sensitive cell line. There was increased expression of pAMPK in PC3 cells treated with rapamycin and metformin and rapamycin.
Conclusions: We observed differential effect of metformin and rapamycin on hormone-independent and dependent PCa cells. We also report for the first time that NMT is a downstream target of mTOR in PCa. Together, our data suggest PI3K/Akt/mTOR pathway is differentially regulated in hormone-dependent and independent PCa cells and regulation of NMT by mTOR may provide further insight into the pathogenesis and progression of PCa.

UP-07.02

What false negative rate are active surveillance patients willing to accept in order to avoid prostate biopsy?

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Introduction and Objectives: Prostate biopsies are associated with significant complications. Imaging and blood/urine-based non-invasive tests are being developed in order to better predict disease grade and volume. We conducted a survey among active surveillance (AS) patients (and their partners) to determine what thresholds of false-negative (FN) they would accept in such a tests(s) to avoid biopsies, and their willingness to pay out-of-pocket for these tests if they were not reimbursed by our public healthcare system.
Methods: We developed a validated eight-question survey for men and their partners to determine the acceptable FN rate for non-invasive test(s) and their acceptable out-of-pocket cost should they not be reimbursed by third-party payers. All patients had confirmed prostate cancer and were managed by AS at our centre. Data was collected on age, level of education, annual income, marital status, number of prior prostate biopsies in order to determine if these covariates were associated with responses.
Results: 130 men completed the survey (number of spouses 23). 90.6% of patients were comfortable with the concept of a non-invasive test in place of a prostate biopsy. 82.8 % would accept a test(s) with a FN rate of 1%, while 64.8% would accept a test(s) with a FN rate of 5%. Significantly, 10% of patients were not comfortable with any alternative to biopsy. Demographics were not associated with response, and spousal responses were similar to those of patients. As for expenditures, 9% would not pay out-of-pocket, while 16.4% would pay $1000 or more and 26.5% $500 or more.
Conclusions: Our results suggest that the vast majority of patients would accept a non-invasive test in place of a transrectal ultrasound (TRUS)

Table 1. UP-07.02. Patient's false negative rate threshold for non-invasive test(s)

False negative rate threshold		Valid percent	Cumulative percent
Valid	80 times out of 100, the biopsy could be safely omitted	13.3	13.3
	90 times out of 100, the biopsy could be safely omitted	21.1	34.4
	95 times out of 100, the biopsy could be safely omitted	30.5	64.8
	99 times out of 100, the biopsy could be safely omitted	18.0	82.8
	995 times out of 1000, the biopsy could be safely omitted	7.8	90.6
	I am not comfortable with a non-invasive test in place of prostate biopsy	9.4	100.0
	Total	100.0	
Missing	System		
Total			

prostate biopsy, however it appears that FN rate of 1% will need to be achieved. Given the limitation of current imaging/biomarkers, periodic prostate biopsy will be needed in routine management of men on AS for low-risk prostate cancer.

UP-07.03

Does surgical delay for radical prostatectomy affect patient pathological outcome: A retrospective analysis on 1258 patients

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Introduction and Objectives: Given limitations to resources in a publically funded healthcare system, we sought to assess the impact of surgical wait time (SWT) to robot-assisted radical prostatectomy (RARP) on final pathological outcome.

Methods: Retrospective review of 1258 patient records operated by RARP performed between 2006 and 2015 was conducted. SWT was defined as period from prostate biopsy to surgery. Primary outcome was the impact on postoperative Cancer of the Prostate Risk Assessment (CAPRA) score, which has been well-documented to correlate with biochemical recurrence, cancer-specific and overall survival. Patients were stratified according to D'Amico risk categories. Univariate and multivariate analysis with a generalized linear model was used to evaluate the effect of SWT and other predictive factors (age, body mass index (BMI), biopsy Gleason score, clinical stage and, percentage of positive cores) on pathological outcome in each risk group and on the overall sample.

Results: 835 patients were eligible for analysis. High and intermediate D'Amico risk categories were grouped together in the same strata, due to the limited number of men (55) in D'Amico high-risk category. Mean SWT was significantly different between the two groups: 162.9 days in high/intermediate-risk group vs. 179.3 in low-risk group (p=0.009). After stratification on D'Amico risk group, SWT did not significantly affect postoperative CAPRA score on univariate analysis in both strata. In multivariate analysis, SWT was significantly correlated to CAPRA score only in high/intermediate-risk group (p=0.049). There was no correlation in multivariate analysis in the low-risk group and in the overall cohort. Predictors of higher CAPRA score in the multivariate model were: older age (p=0.030), biopsy Gleason score (p<0.001), percentage of positive cores (p=0.001), clinical stage (p<0.001), and SWT (p=0.049).

Conclusions: In the present study, evaluating SWT for Canadian men in a publically funded system, increased delay for surgery could affect the pathological outcome. Further studies are needed to give more solid proof and assess the impact of SWT on biochemical-free survival, cancer-specific survival, and disease-free survival.

UP-07.04

Prostate cancer patients' met and unmet supportive care needs: A cross-sectional, population-based survey

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Introduction and Objectives: To determine the met, unmet, and total supportive care needs of prostate cancer patients.

Methods: Surveys were conducted in three provinces (BC, AB, SK) from 2014-15, using a modified Dillman mail-survey methodology. A random sample of ~55% of men in each provincial registry diagnosed with prostate cancer in the last half of 2012 was surveyed. Supportive care needs were assessed using a modified version of the 34-item Supportive Care Needs Survey, supplemented with the eight-item Prostate Cancer Survey.

Results: Response rates ranged from 46-55% (n=1007). Overall mean age was 69 years. Most were either receiving followup monitoring after active treatment (49%) or were on active surveillance or watchful waiting (22%). Respondents reported more met (M=7.7, SD=9.1) than unmet needs (M=3.8, SD=6.2), t (937)=10.9; p<0.001. In order of frequency, domains of need (based on average frequency of reported total met or unmet need) were: sexual (41%), health system and information (39%), psychological (25%), care and support (24%), prostate cancer specific (21%) and physical and daily living (19%). Top five met needs were being informed about test results as soon as possible (45%), being informed that the cancer is under control (37%), being treated as a person (34%), being informed about benefits and side effects of treatments (33%), and being informed about the things one can do to help get well (32%). Top five unmet needs were related to sexual feelings (24%), changes in sexual relationships (23%), perceived loss of manhood (21%), uncertainty about the future (17%), and being given information about sexual relationships (17%). Respondents who received active treatment (surgery, external beam radiation, or brachytherapy) reported more total (met or unmet) needs (M=16.3, SD=15.1) than those who received surveillance or watchful waiting (M=10.5, SD=13.6) (t (890)=3.78; p<0.001), but did not report significantly more unmet needs (t (890)=1.58; p<0.12).

Conclusions: A considerable proportion of prostate cancer patients have unmet supportive care needs. Most unmet needs relate to changes in sexual feelings or sexual relationships, and uncertainty about the future. Interventions are needed to assist prostate cancer patients in adapting to sexual changes, address their information needs, and support their psychological well-being.

UP-07.05

Castration-resistant prostate cancer patients in Quebec: Medication use in the last year of life

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Introduction and Objectives: The current management of metastatic castration-resistant prostate cancer (mCRPC) has become very complex with the approval of several new drugs. The study objective was to describe medication use in the last year of life of patients dying of prostate cancer in Quebec.

Methods: The study cohort consists of patients who received medical or surgical castration, became castration-resistant and died between January 2001 and July 2013 in Quebec. CRPC was defined as patients who received chemotherapy, abiraterone (Abi), palliative radiotherapy, bone-targeted therapy (BTT) or an anti-androgen. For each patient in the study cohort, medication use (CRPC-related and overall) was identified from the RAMQ pharmaceutical database by 12-, six-, three- and one-month periods prior to death.

Results: The cohort consists of 1692 patients who died of CRPC in the study period. 767 (45.3%) and 169 (10.0%) patients had received BTT and Abi, respectively. Of the patients receiving BTT at any time, 54.4%, 73.7%, 80.8% and 89.8% received a prescription in the one-, three-, six- and 12-month period before death, respectively. Among the patients receiving Abi at any time, the corresponding figures were: 49.1%, 65.7%, 79.9%, and 96.5%, respectively. The percentage of patients receiving androgen-deprivation therapy (ADT) in the one-, three-, six- and 12-month period before death were: 10.7%, 59.6%, 74.8%, and 83.6%, respectively. The median number of prescriptions per month was 7.1 (interquartile range (IQR 4.6-10.1) in the last 12 months of life, 7.8 (IQR 5.1-11.3) in the last six months, 8.7 (IQR 5.1-12.8) in the last three months, and 1.7 (IQR 0-5.7) in the last month of life.

Conclusions: In the CRPC group, a large proportion of patients maintained their medications in their last months of life. Persistent ADT, BTT, and Abi during the last few months of life are common, associated with significant costs, yet debatable benefit.

UP-07.06

TrueNTH peer navigation for prostate cancer patients and their caregivers: Initial discovery and lessons learned

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Introduction and Objectives: As part of TrueNTH initiatives, we are developing a program of peer navigation to improve prostate cancer (PCa) patients' experience of care. PCa survivors are trained as peer providers of informational and emotional support services. The discovery phase aims to review the status and challenges of existing peer-support programs in order to define the TrueNTH intervention.

Methods: A systematic review of published literature, an environmental scan, and semi-structured interviews of stakeholders were undertaken.

Results: Only six of the 34 Canadian programs are peer-led and none are specific to PCa patients, suggesting the existence of a care gap in this group. Identified peer-led programs provide one-time connects (single phone call or visit) or short-term communication. Evaluation of outcomes show high satisfaction and acceptability rates among the majority of cancer patients who participated in peer-support programs. Two one-on-one peer-support intervention studies were specific to PCa, one indicated improvement in psychological distress from baseline and another identified lower depression and higher self-efficacy for the intervention group. Our interviews with healthcare professionals (HCPs) found positive and supportive perspectives to peer navigation for PCa patients. The best point of entry is suggested to be immediately after diagnosis. HCPs believe anything that helps patients make more informed and considered decisions is beneficial to clinical practice. A well-designed training program for peer navigators is necessary for provision of appropriate personal support to PCa patients.

Conclusions: Drawing from available resources and the literature, well-trained and experienced cancer survivors provide cognitive and emotional support to cancer patients to help reduce the psychosocial burden of cancer. Our intervention will provide a unique opportunity for PCa patients, matched with peers based on their individual preferences and communication needs, move forward through their cancer journey in a supportive environment.

Funded by Prostate Cancer Canada through Movember Foundation. (http://au.movember.com/programs/prostate-cancer).

UP-07.07

Real-world experience of degarelix, a luteinizing hormone-releasing hormone antagonist in prostate cancer

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Introduction and Objectives: Luteinizing hormone-releasing hormone (LHRH) antagonists showed remarkable response in trials. There are few case series outside clinical trials. This is the first report in a Canadian community setting.

Methods: Data from patients in electronic medical records were entered and analyzed. The primary outcome is response rate.

Results: From January 2011 to April 2015, degarelix was recommended to 176 patients. Seven patients declined due to drug interaction, comorbidities, or inconvenience. The remaining patients were categorized as Group Adjuvant (27), Biochem (49, asymptomatic prostate-specific antigen (PSA) relapse), Met (74), and Primary (19 primary treatment for non-metastatic disease). Group Biochem had a PSA response of 80% (20/25 evaluable patients) with first-line degarelix and 62% (8/20) after failing LHRH agonist with/without anti-androgens; while group Met had a 76% (29/38) and 28% (7/25) response, respectively. 25 patients were given degarelix monotherapy initially and at time of PSA progression, 21 responded when bicalutamide was added. Some patients have multiple side effects, which mainly included 13 local pain, three local swelling, eight fever/chills, five rashes, five hot flashes, and one pulmonary embolism (possibly related). There were no other documented cardiovascular complications. There were 24/133 (18%) patients requested to stop the drug due to side effects, without any supportive medications to prevent or treat them. However, only 1/22 (4.5%) patients stopped degarelix if given Benadryl, Tylenol, topical lidocaine or steroid, and/or dexamethasone 0.5-1 mg. Patients with non-severe reactions were compliant to continue after physician explanation of the superiority of degarelix over LHRH agonists.

Conclusions: The addition of an anti-androgen to degarelix as total androgen blockade improves its effectiveness. Improved communication with patients and family doctors, and supportive medications can help patients to stay on degarelix longer.

UP-07.08

Feasibility and early experience of a multidisciplinary prostate cancer clinic at a community hospital

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Introduction and Objectives: Patients with prostate cancer represent a diverse patient population with often complex medical needs. Treatment options for patients in all disease states have expanded in the last several years. Not all patients have ready access to a tertiary care cancer centre. We sought to assess the feasibility of a dedicated multidisciplinary prostate cancer clinic at a community hospital and to assess the impact of the clinic on cost and quality of care.

Methods: The planning, development, and early experience of the prostate cancer clinic are described. Data was prospectively collected during the initial six months of clinic operation. Clinic volumes, patient satisfaction, and patient characteristics, such as disease state and Eastern Cooperative Oncology Group (ECOG) status, are presented. Patient use of hospital resources and impact on hospital revenue is also described.

Results: During six months of the clinic, there were 602 patient visits. 374 unique patients were seen; 118 patients had multiple visits to the clinic. Patients with biochemical failure represented 17% of visits. Patients with metastatic disease or castrate-resistant disease represented 32% of visits. 17% of patients had ECOG scores of 2-4. 22% of the visits involved use of the hospital outpatient laboratory. 45% of visits involved use of the hospital outpatient pharmacy. The use of the hospital pharmacy led to $29 216 in additional hospital revenue, as well as direct savings for many patients. Community support for this program has resulted in $80 000 in donations through the hospital foundation. Wait times for surgery were within provincial targets 100% of the time. Patient satisfaction was high, with 100% of patients reporting the care they received as positive.

Conclusions: The creation of a dedicated prostate cancer clinic at a community hospital is feasible and offers several potential advantages to the patient, clinician, and institution.

UP-07.09

Association between obesity and pathologic upgrading in localized prostate cancer

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Introduction and Objectives: Obesity is an increasingly prevalent health concern worldwide. Studies have tested the association between obesity and prostate cancer with conflicting results. Obesity (body mass index (BMI) of ≥30 kg/m^2) has been linked to higher prostate cancer incidence, grade, risk of biochemical recurrence, and cancer-specific mortality. Gleason score on biopsy remains one of the strongest prognostic indicators for predicting prostate cancer aggressiveness. Gleason score upgrading (GSU) rates of up to 57% have been reported. As such, there remains a significant risk of undertreating prostate cancer using the biopsy Gleason score alone. Identifying GSU risk factors is an increasingly important issue. A paucity of data exists that address the risk of GSU and obesity.

Methods: We retrospectively analyzed the records of a consecutive series of men who underwent robot-assisted radical prostatectomy (RARP) a single academic tertiary centre. Patient age, preoperative prostate-spe-

cific antigen (PSA), biopsy and pathological Gleason scores, and prostate weight were analyzed against BMI.
Results: 204 patients met the inclusion criteria. Of this patient population, by using calculated BMI, 37% were obese. No significant difference in the age at surgery (61.7 vs. 62.0 years; p=0.84) or PSA level (8.06 vs. 10.04 ng/ml; p=0.14) was found between groups. However, prostate weight (51.0 vs. 56.9 g; p=0.04) was larger in the obese group. No difference was found in the rate of pathologic upgrading in obese vs. non-obese patients (27.5% vs. 33%; p=0.52).
Conclusions: In patients undergoing RARP for clinically localized prostate cancer, in our sample obesity was not associated with a higher rate of pathologic upgrading. These results contribute to the paucity of existing data on whether obesity is a significant contributor to pathologic upgrading. Our study suggests that obese patients undergoing RARP are not more likely to have aggressive prostate cancer. As data entry is ongoing, we anticipate have over 500 cases for further evaluation.

UP-07.10

The androgen-deprivation therapy educational program: A Canadian True NTH initiative

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Introduction and Objectives: Androgen-deprivation therapy (ADT) is commonly used to treat prostate cancer, but has many adverse effects that can directly impair patients' quality of life and, indirectly, that of their intimate partners. In five Canadian cities, we offer a program on how patients and their partners can stay physically and emotionally healthy and co-supportive when the patient is on ADT.
Method: Patients recently prescribed ADT and their partners attend a 1.5-hour class and receive the book *Androgen-Deprivation Therapy: An essential guide for men with prostate cancer and their partners* (Wassersug et al., 2014). Attendees learn strategies for managing ADT side effects and use goal-setting exercises to make beneficial lifestyle adjustments to help manage ADT side effects. To evaluate the effectiveness of the educational program, participants complete questionnaires before attending the class and again 2-3 months later. The questionnaires assess: 1) ADT side effect frequency and bother; 2) self-efficacy in side effect management; 3) physical activity; and 4) relationship adjustment.
Results: As of December 2015, 232 patients and 150 partners have attended the program in Halifax, Toronto, Victoria, Vancouver, and Calgary. 86 participants consented to participate in the evaluation of the ADT Educational Program. Participant feedback has been overwhelmingly positive.
Conclusions: The ADT Educational Program is becoming usual care at these centres. It remains to be seen how effective the program is in limiting the bother from ADT side effects and helping couples maintain strong relationships. An online version of the program will soon be available for patients across Canada.

UP-07.11

Quality assessment of the Canadian Prostate Cancer Biomarker Network platform using the validated prostate cancer biomarker nuclear factor-kappa B p65

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Introduction and Objectives: The Canadian Prostate Cancer Biomarker Network (CPCBN) is a program that gathers researchers from several institutions from four different Canadian provinces. This network assembled a validation tissue-microarray (TMA) resource composed of 1508 patients treated by radical prostatectomy (RP) separated within test-TMA and full TMA series. This richly annotated resource is available for prostate cancer researchers who wish to access a large cohort to validate their prognostic biomarkers.[1] Over the last decade, we and others have uncovered a robust association between the nuclear localisation of nuclear factor-kappa B (NF-kB) p65, prostate cancer aggressiveness, and biochemical recurrence (BCR).[2,3] Thus, for quality assurance, the CPCBN series was challenged for p65 expression analysis.
Methods: Automated immunohistochemistry staining of p65 was performed using the CPCBN test-TMAs. This test series contains a minimum of three cores of tumour tissues and two cores of adjacent benign tissues from 250 RP specimens. Two independent observers scored percent of nuclear staining. Statistical analyses were performed using SPSS software.
Results: By Kaplan-Meier analysis, we validated the significant association between an increase in nuclear frequency of NF-kB p65 and biochemical relapse (log rank, p=0.05, cutoff of 3%) while Cox regression analyses showed a trend (dichotomized p65: p=0.06, Exp(B) 1.58, 95% CI 0.99-2.53). Nuclear frequency of p65 was also associated with increase risk of developing bone metastasis (Cox regression, p=0.03, Exp(B) 1.06, 95% CI 1.006-1.117), although this will need to be confirmed on a larger cohort.
Conclusions: Our study recapitulates previous observation linking NF-kB p65 with disease progression using a large cohort of Canadian men and also highlight its role as a predictor of bone metastasis.

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UP-07.12

Describing perspectives of healthcare professionals about active surveillance

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Introduction and Objectives: Practice of active surveillance (AS) for men with low-risk prostate cancer (PCa) is growing across Canada. This study seeks to gain a deeper understanding of healthcare professionals' (HCP) perspectives in regards to AS and the factors that influence men's decision to follow this course of action.
Methods: Focus groups (n=5) were held with HCP who care for men with PCa and are engaged in conversations about AS. Sessions were

conducted in four Canadian provinces within academic hospitals (CHUM and MUHC in Quebec, UHN in Ontario, Cancer Care in Manitoba and VCH in British Columbia). Viewpoints were captured regarding current practice regarding AS, the factors that influence the decision to engage in conversations about AS with patients, and observations about the factors that influence men to elect to follow an AS protocol. A content and theme analysis was performed on the verbatim transcripts from the sessions.
Results: 48 HCPs participated in the focus groups and included family physicians, urologists, surgeons, and radiation oncologists. Most described thinking about PCa on a continuum from low-risk to high-risk and saw the need to tailor their recommendations for AS to men based on several factors: status of the disease, patient comorbidity, and perception of the person's ability to cope. There was broad support for the practice of AS, but little consensus about age being a determining factor in its practice, definitive categorization of marginal patients, the ideal protocol for AS, protocols for long-term followup of men on AS, and AS practices beyond academic centres. Variation was evident in the actual explanations provided and the processes used to inform men about AS.
Conclusions: Currently, there are various AS protocols in place across Canada. This is especially true after the initial year of surveillance. Men need to have tailored approaches to their surveillance and clear explanations to make informed decisions about following this approach.

UP-07.13

Age at diagnosis and natural history of stage IV prostate cancer: A population-based analysis

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Introduction and Objectives: There are few data regarding the impact of age on the natural history of stage IV prostate cancer (PCa). To address this limitation, we examined the relationship between age at diagnosis and the rates of single vs. multiple metastatic sites in patients with metastatic PCa.
Methods: Patients with metastatic PCa were abstracted from the Nationwide Inpatient Sample (1998-2010). Most common metastatic sites within the entire population were described. Stratification was performed according to the presence of single or multiple (≥ 2 sites) metastases. Additionally, age at diagnosis was stratified into four groups: ≤60, 61-70, 71-80, and >80 years. Cochran-Armitage trend test and multivariable logistic regression tested the relationship between age and the rate of multiple metastatic sites.
Results: 74 826 patients with metastatic PCa were identified. The most common metastatic sites were bone (84%), distant lymph nodes (11%), liver (10%), lung (9%), and brain (3%). Overall, 18% of patients had multiple sites involved. The average age of individuals with multiple vs. single metastatic sites was 72.6 and 74.3 years ($p<0.001$), respectively. After age stratification, the rate of patients with multiple metastatic sites decreased with increasing age: 21%, 21%, 19%, and 15% for patients aged ≤60, 61-70, 71-80, and >80 years ($p<0.001$), respectively. These results were confirmed in patients with bone, liver, lung, and brain metastases (all $p< 0.01$).
Conclusions: The proportion of patients with multiple metastatic sites is higher in younger patients. These findings are similar to studies focusing on other urological malignancies, suggesting that younger individuals are more likely to present with more aggressive disease phenotype.

UP-07.14

Patterns of care in castration-resistant prostate cancer: Impact of initial primary treatment

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Introduction and Objectives: Management of castration-resistant prostate cancer (CRPC) has become very complex. Little is known about the impact of initial treatment for prostate cancer on patterns of care in the CRPC phase. Our study aimed to analyze treatment patterns in CRPC in Quebec by initial treatment received.

Table 1. UP-07.13. Descriptive characteristics of patients diagnosed with metastatic prostate cancer, nationwide inpatient sample, 1998-2010

	Overall	≤60 years	61-70 years	71-80 years	>80 years	*p* value
No. of patients	74 826	8853	16 885	25 791	23 300	
Site of metastases (%)						
Bone	63 134 (84.4)	6766 (76.4)	13 605 (80.6)	22 361 (86.7)	20 402 (87.6)	<0.001
Distant lymph nodes	7912 (10.6)	1875 (21.2)	2513 (14.9)	2236 (8.7)	1288 (5.5)	<0.001
Liver	7615 (10.2)	1038 (11.7)	1925 (11.4)	2575 (10.0)	2077 (8.9)	<0.001
Lung	6366 (8.5)	670 (7.6)	1349 (8.0)	2307 (8.0)	2040 (8.8)	<0.001
Brain	2355 (3.1)	347 (3.9)	748 (4.4)	785 (3.0)	475 (2.0)	<0.001
Other[a]	4502 (6.0)	560 (6.3)	1148 (6.8)	1528 (5.9)	1266 (5.4)	<0.001
No. of metastatic sites (%)						
1	61 095 (81.6)	7030 (79.4)	13 411 (79.4)	20 858 (80.9)	19796 (85.0)	<0.001
≥2	13 734 (18.4)	1823 (20.6)	3474 (20.6)	4934 (19.1)	3503 (15.0)	
Race (%)						
Caucasian	38 682 (51.7)	3652 (41.3)	7898 (46.8)	13 341 (51.7)	13 791 (50.2)	<0.001
African-American	11 980 (16.0)	1999 (22.6)	3351 (19.8)	4011 (15.6)	2619 (11.2)	
Hispanic	4724 (6.3)	812 (9.2)	1244 (7.4)	1577 (6.1)	1091 (4.7)	
Other[b]	2338 (3.1)	304 (3.4)	449 (2.7)	869 (3.4)	716 (3.1)	
Unknown	17 104 (22.9)	2085 (23.6)	3942 (23.3)	5994 (23.2)	5083 (21.8)	
CCI (%)						
0	51 619 (69.0)	6862 (77.5)	11 664 (69.1)	17 218 (66.8)	15 875 (68.1)	<0.001
1	17 449 (23.3)	1618 (17.1)	3963 (23.5)	6442 (25.0)	5526 (23.7)	
2	4852 (6.5)	412 (4.7)	1056 (6.3)	1782 (6.9)	1603 (6.9)	
≥3	910 (1.2)	62 (0.7)	202 (1.2)	351 (1.4)	295 (1.3)	

CCI: Charlsonn comorbidity index
[a] Includes small intestine, large intestine, other metastases in the digestive system, kidney, adrenal gland, pleura, mediastinum.
[b] Includes Asian, Pacific Islander, Native American, and other unspecified.

Table 2. UP-07.13. Multivariable logistic regression analysis predicting the rate of multiple (≥2) metastatic sites dichotomized according to age groups (≤60 vs. >60 years) within the entire population and according to the most common metastatic sites

Site of metastasis	Odds ratio (95% CI)[a] ≤60 vs. >60 years	*p* value
Overall	1.055 (1.05-1.06)	<0.001
Bone	1.32 (1.24-1.40)	<0.001
Distant lymph nodes	0.45 (0.41-0.51)	<0.001
Liver	1.23 (1.05-1.45)	<0.001
Lung	2.47 (1.91-3.18)	<0.001
Brain	1.05 (0.81-1.38)	0.5

CI: confidence interval

[a]Model adjusted for Charlson comorbidity index, year of diagnosis, hospital region, and race.

Methods: The cohort selected patients with evidence of CRPC from January 2001 to June 2013 from the public healthcare insurance programs (Régie de l'Assurance Maladie du Québec (RAMQ) and Med-Echo databases). Multivariate logistic regression was used to measure associations between initial primary treatment and patterns of care in CRPC, adjusted for many covariates including comorbidities in the one-year period prior to CRPC.

Results: Our cohort consists of 2898 patients. Initial treatment for prostate cancer was radical prostatectomy (RP) in 713 patients (24.6%), external-beam radiotherapy (EBRT) in 465 patients (16.1%), and androgen-deprivation therapy (ADT) in 1720 (59.4%). Median age at CRPC was 77.0 (72.0-82.0), 75.0 (70.0-79.0) and 74.0 (70.0- 79.0) in the ADT, EBRT, and RP groups, respectively. In the CRPC phase, 547 patients received chemotherapy (overall 18.9%; 15.5%, 26.7%, and 22% in ADT, EBRT, and RP groups, respectively), 159 patients received abiraterone (overall 5.5%; 4.1%, 8.0%, and 7.2%, respectively). When adjusted for covariates, RP (OR 1.30, 95% CI 1.06-1.61) was associated with greater use of bone-targeted therapy compared to the ADT group. EBRT was associated with greater chemotherapy use (OR 1.73, 95% CI 1.33-2.25) compared to the ADT group. Both local treatments were associated with increased use of palliative radiation vs. ADT patients (OR EBRT 1.78, 95% CI 1.39-2.28; OR RP: 1.37, 95% CI 1.10-1.71). A significant decrease in usage for all CRPC treatments was observed for older patients (OR age between 0.94 and 0.98).

Conclusions: In our cohort, the type of initial primary treatment was associated with certain treatment patterns in the CRPC phase.

UP-07.15

Ten-year trends in prostate MRI use, referral patterns, and clinical utility at the Massachusetts General Hospital

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Introduction and Objectives: Use of prostate magnetic resonance imaging (MRI) is rapidly increasing despite the lack of strong clinical evidence to support its use. We examine trends in prostate MRI use to better characterize the volume of prostate MRI examinations, underlying examination indications, referral patterns, and diagnostic findings.

Methods: We conducted a retrospective analysis of all prostate MRIs performed between 2005 and 2015 at a single, large-volume, academic institution in the United States. Studies were categorized based on the clinical history provided in the radiology order and study interpretations. Studies missing dates or radiology interpretations were excluded.

Results: A total of 2273 studies were performed from 2005-2015. Prostate MRIs performed per year were less than 100 prior to 2011 and increased rapidly to over 600 per year in 2015. The top 20% of ordering providers accounted for 91% of all studies ordered. Urologists accounted for the largest number of studies ordered (57.2%), followed by hematologist/oncologists (14.1%), and radiation oncologists (15.1%). The most common indications for ordering a prostate MRI were initial staging/restaging patients who had not undergone treatment and were not on active surveillance (51.1%), rising prostate-specific antigen (PSA) with negative biopsy (18.5%), active surveillance (10.9%), and surveillance following prostatectomy or radiation (7.7%). Age was not significantly different across the different indications. The MRI results revealed positive findings in 28.6%, negative findings in 23.7%, and indeterminate findings in 17.4% of cases.

Conclusions: This study demonstrates a rapidly rising trend in the use of prostate MRIs despite the absence of established guidelines to support its use. Clear guidelines for prostate MRI use will be necessary, given the rapid trend in use.

UP-07.16

A pragmatic Canadian study of abiraterone acetate in the community urology setting: COSMiC

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Introduction and Objectives: A Canadian Observational Study in Metastatic Cancer of the Prostate (COSMiC) is a non-interventional observational study (Phase 4, ClinicalTrials.gov: NCT02364531) specifically designed to examine the use of abiraterone acetate in the community urology setting and to evaluate patient-reported outcomes (PRO). This data will serve to complement existing safety and efficacy information, prompting increased understanding of the castration-resistant prostate cancer (CRPC) patient experience with abiraterone acetate.

Methods: Functional Assessment of Cancer Therapy Prostate (FACT-P), Montreal Cognitive Association (MoCA) testing for cognitive impairment and evaluation of adverse events (AE) associated with treatment with abiraterone acetate were assessed. Descriptive and basic statistics and univariate analysis were used to summarize categorical and continuous data. Changes from baseline to Week 12 were summarized with an estimate of the 95% confidence interval (CI) for the mean change.

Results: 53 initial patients with the median age of 78.8 (64.0-91.0) for whom data was available for both baseline and Week 12 followup were included in this analysis. Five patients did not complete Week 12 FACT-P data and 18 patients had both baseline and Week 12 MoCA assessments. Comparison of FACT-P total scores did not show a statistically significant change (95% CI for the means -1.0, 6.4]. At baseline, median score for MoCA from 20 patients was 24.9 (range 12-30) with no statistically significant change at 12 weeks (median 23.8; range 3.0-30, 95% CI for differences in the means -2.5, 0.7]. In addition, 39 patients had reported some type of AEs with peripheral edema most commonly reported in six patients (15.4%) and fatigue reported in one patient (2.6%).

Conclusions: In this preliminary analysis, FACT-P and MoCA assessments did not demonstrate statistically significant changes at Week 12 compared to baseline. There appeared to be no degradation in the functioning (physical, social, emotional, functional or cognitive) after 12 weeks of therapy. In addition, 12-week followup safety evaluation of treatment with abiraterone acetate appears in line with the previously reported Phase 3 clinical trial data,[1] with no new patterns or safety signals identified.

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