Podium Session 1: Early Prostate Cancer
June 25, 2017; 1040–1140

POD-01.01

Magnetic resonance imaging-targeted vs. systematic biopsies in men on active surveillance: Results of a prospective, randomized Canadian Urology Research Consortium trial

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Study Groups: This study was funded by the Ontario Institute for Cancer Research, This study was implemented and managed by the Canadian Urology Research Consortium (CURC)

Introduction: This is the first report of a multicentre, prospective, randomized phase 3 trial to determine if multiparametric magnetic resonance imaging (mpMRI) and targeted biopsy can improve selection of patients eligible for active surveillance through improved detection of clinically significant cancer compared to systematic biopsy. The primary outcome was the proportion of subjects whose biopsy was upgraded at their confirmatory biopsy to Gleason score 7 (3 + 4) or higher.

Methods: Eligible patients were diagnosed with favourable-risk prostate cancer (Gleason 6 and prostate-specific antigen [PSA] <10) within the previous 12 months. 296 patients were registered and 273 randomized between systematic 12-core biopsy and an MRI, with targeted and systematic biopsies, done between six and 13 months after the initial biopsy. There were no differences between treatment arms in terms of stratum, demographics, tumour characteristics, or prior treatments.

Results: 31 (23%) of transrectal ultrasound (TRUS)-guided biopsy patients had Gleason 7 or higher cancer compared with 29 (21.2%) of the MRI-guided biopsy (p=0.68). Independent, blinded pathology review was performed on 188 patients. Upgrading incorporating path review occurred in 36/132 (27.3%) of TRUS-guided and 42/127 (33.1%) of MRI-guided biopsy patients (p=0.34). The positive predictive value (PPV) for Gleason 7 or higher cancer for Prostate Imaging Reporting and Data System (PI-RADS) score 1–2, 3,4, and 5 was 13%, 29%, 24%, and 33%, respectively. 2/12 (16.7%) with a MRI score of 1, and 3/33 (9%) with MRI score of 2 had Gleason 7 or higher cancers on systematic biopsy. The negative predictive value (NPV) of PI-RADS 1–2 for Gleason ≥7 was 89%. The results of targeted vs. systematic biopsy in the MRI arm is listed in Table 1.

Conclusions: No significant difference was observed in the rate of upgrading between confirmatory biopsy with TRUS compared with MRI-guided targeted biopsy. No secondary outcome was statistically significant. Performing confirmatory targeted biopsy only in men with a PI-RADS lesion ≥3 would identify 89% of Gleason 7 or greater cancers.

POD-01.02

Germline mutations in the kallikrein 6 region and predisposition for aggressive prostate cancer

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Introduction: Prostate cancer (PCa) is a highly heterogeneous disease, ranging from indolent to rapidly progressing life-threatening metastatic disease. There is a need for markers identifying patients at increased risk of harbouring aggressive forms of PCa.

POD-01.01. Table 1. Patients in MRI-guided targeted biopsy arm: Targeted vs. systematic biopsy results

		MRI-targeted biopsies (n=127)				
		No cancer	Gleason 6	Gleason 7	Gleason 8	Total upgraded by MRI only
Systematic biopsies	No cancer	37	3	3	0	3
	Gleason 6	36	22	5	0	5
	Gleason 7	5	3	9	0	
	Gleason 8	2	0	1	1	
Total upgraded by systematic biopsy only		7	3			

MRI: magnetic resonance imaging.

Methods: We surveyed the Kallikrein (KLK) region (KLK1-15) for single nucleotide polymorphisms (SNPs) associated with aggressive PCa (Gleason score ≥8) in 1858 PCa patients. Discovery (Swiss arm of the European Randomized Study of Screening for PCa, n=379; Toronto, Canada, Princess Margaret Cancer Centre, n=540) and a validation cohort (Prostate, Lung, Colorectal, and Ovarian [PLCO], n=939) were analyzed. Fine-mapping was carried out by genotyping and imputation (discovery cohort) or provided by DbGaP (PLCO). Biochemical-free survival was evaluated in an intermediate-risk disease cohort (International Cancer Genome Consortium [ICGC]; n=130). Single- and multi-SNP association studies, as well as haplotype analyses were performed. All statistical tests were two-sided.
Results: Several SNPs in strong linkage disequilibrium in the KLK6 region, within the same haplotype (rs113640578, rs79324425, rs11666929, rs28384475, rs3810287), identified patients at increased risk of aggressive PCa in both discovery (odds ratio [OR] 3.51–3.64; 95% confidence interval [CI] 2.01-6.36; p=1.0 x 10^{-5}–8.4 x 10^{-6}) and validation (OR1.89–1.96; 95% CI 0.99–3.71; p=0.04–0.05) cohorts. The validation cohort revealed another important haplotype with two SNPs at the same locus (rs28665094, p=0.006 and rs268890; p=0.005) associated with aggressive PCa. The overall test of haplotype association was highly statistically significant in the discovery cohort (p=3.5 x 10^{-4}), in the PLCO cohort (p=0.006) and when combined (p=2.3 x 10^{-5}). These germline SNPs predicted relapse independently of standard clinical and molecular factors in the ICGC cohort (hazard ratio [HR] 3.15; 95% CI 1.57–6.34; p=0.001).
Conclusions: Our fine-mapping study has identified novel loci in the KLK6 region strongly associated with aggressive PCa.

POD-01.03

Association between germline genetic variation and progression in men with low-risk prostate cancer on active surveillance

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Introduction: Active surveillance (AS) is the preferred initial treatment for men with localized, low-risk prostate cancer (PCa). Challenges in AS include: identifying candidates, risk-stratifying followup, and defining clinically significant progression. Although the link between germline genetics and PCa outcomes has been investigated, their influence on AS remains unclear.
Methods: DNA from peripheral blood was available for 490 men followed for AS at our institution. All men had low-risk PCa: Gleason <7, <4 positive cores, <50% core involvement, and prostate-specific antigen (PSA) <10.0 ng/dL, and had ≥1 post-diagnostic biopsy. We genotyped 360, 346 single nucleotide polymorphisms (SNPs) using a custom array (OncoArray); all SNPs had a call rate ≥95% and a minor allele frequency ≥1%. Cox proportional hazards assessed SNPs and time to pathological (failing to meet low-risk criteria at rebiopsy) and therapeutic progression (first of pathological progression or initiation of medical therapy). Secondary analyses evaluated the same outcomes for 11 SNPs previously studied for PCa progression.
Results: Over a median 44 months of followup, 206 (42%) and 227 (46%) men progressed pathologically and therapeutically. Men who progressed had worse pathological characteristics at diagnosis (PSA, prostate volume, number of positive cores, and max % core involvement; p<0.05). After correcting for multiple analyses, one SNP (rs4464333) remained associated with pathological progression (hazard ratio [HR] 5.51, 95% confidence interval [CI] 3.01–10.1; p=3 x 10^{-8}) and one SNP (rs6583016) remained borderline-associated with therapeutic progression (HR 2.30, 95% CI 1.67–3.17; p=3 x 10^{-7}) (Table 1). Of the 11 previously studied SNPs, rs7141529 associated with therapeutic progression (HR 1.32, 95% CI 1.02–1.73; p=0.03).
Conclusions: We identified two novel germline genotypic variants that significantly associated with an increased risk of progression in men undergoing AS. These findings, if validated, may improve patient selection for, and followup on AS.

POD-01.04

Defining a cohort of men who may not require repeat prostate biopsy based on the negative predictive value of PCA3 and magnetic resonance imaging combined: The double-negative effect

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Introduction: Multiparametric magnetic resonace imaging (mpMRI) and the PCA3 urine test aim to limit prostate cancer (PCa) overdiagnosis and overtreatment by identifying less indolent cancer and more clinically significant cases. We explore whether the utility of the tests can be maximized by combining them for a group of patients with previous prostate biopsies.
Methods: We collected clinicopathological data from all patients with previous negative biopsies or on active surveillance (AS) for low-risk PCa that underwent urine PCA3 from 2011 to June 2016 at the University Health Network in accordance with ethics committee approval. We explored whether age, prostate-specific antigen (PSA), PCA3, mpMRI, digital rectal exam (DRE), family history, and prostate size predicted for clinically significant PCa on repeat biopsy as defined by Epstein criteria.

POD-01.03. Table 1. Most significant SNPs in primary analyses

	Chr	SNP ID	Base pair	Allele	MAF	MM	Mm	mm	HR	CI	p
Pathological progression	2	rs4464333	48673328	A	0.01	476	14	0	5.51	3.01–10.07	**3.01E–08***
	4	chr4:34796109	34796109	G	0.01	436	8	1	4.55	2.50–8.31	7.85E–07
	1	rs6583016	107763924	C	0.07	421	62	5	2.28	1.63–3.18	1.22E–06
	1	rs6682225	196432158	A	0.40	181	223	86	1.59	1.31–1.92	2.10E–06
	8	chr8:33944351	23944351	A	0.02	475	15	0	4.19	2.32–7.59	2.13E–06
Therapeutic progression	1	rs6583016	107763924	C	0.07	421	62	5	2.30	1.67–3.17	3.07E–07**
	1	rs6682225	196432158	A	0.40	181	223	86	1.55	1.29–1.86	2.42E–06
	9	rs10977897	9632921	G	0.15	357	115	16	1.68	1.35–2.11	4.69E–06
	1	rs10922071	196433870	A	0.32	230	207	53	1.54	1.28–1.86	5.40E–06
	16	rs4783689	68853671	A	0.36	192	241	57	0.61	0.49–0.76	6.16E–06

*Significant and **borderline-significant after adjusting for multiple comparisons (α<5x10^{-7}). Chr: chromosome; CI: confidence interval; HR: hazard ratio; MAF: minor allele frequency; MM: homozygous dominant genotype; Mm heterozygous genotype; mm: homozygous recessive phenotype; SNP ID: single nucleotide polymorphism cluster ID.

We then stratified patients by mpMRI and PCA3 to detect whether any combination of tests has exemplary negative predictive value (NPV) and considered the optimal sequence of tests.
Results: 470 patients were included with a with median (interquartile range [IQR]) age and PSA of 62.5 ng/mL (58–68) and 6.3 (4.6–8.8), respectively. PCA3 was abnormal (≥35) in 32.5% of cases. In the multivariate model, only age (odds ratio [OR] 1.08; 95% confidence interval [CI] 1.01–1.16), mpMRI score 4 (OR 16.6; 95% CI 3.9–70) or 5 (OR 28.3; 95% CI 5.7–138), and PCA3 (OR 2.9; 95% CI 1.0–8.8) predicted for clinically significant PCa. No patients with a negative mpMRI and normal PCA3 had clinically significant PCa on biopsy (0 of 26, 100% NPV for double-negative test; p<0.0001). Using mpMRI as the initial test diminishes the number of overall tests (11 fewer tests per 100 patients) and adds spatial information for targeted biopsy.
Conclusions: Both PCA3 and mpMRI are useful tests for predicting clinically significant PCa on repeat prostate biopsy. In the one of six patients in our cohort with double-negative tests, no clinically significant PCa was found on biopsy, which raises the question of whether biopsy can be avoided in this group altogether.

POD-01.05

Prostate-specific antigen levels in men aged 60–70 and development of lethal prostate cancer over 30 years: Implications for risk-stratified screening

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Introduction: We sought to determine if a prediagnostic prostate-specific antigen (PSA) level in men aged 60–70 years predicts future risk of lethal prostate cancer and could be used to risk-stratify screening, potentially allowing men at low risk to be exempt from further screening.
Methods: We conducted a nested case-control study among men aged 60 (57.5–62.5), 65 (62.5–67.5), and 70 (67.5–72.5) years who gave blood before enrollment in the Physicians' Health Study of primarily white, U.S. male physicians initiated in 1982. Baseline PSA levels were available for 109 lethal prostate cancer cases that were matched to 327 age-matched controls or non-lethal prostate cancer cases. Lethal was defined as metastatic (to bones or distant organs) or fatal prostate cancer. Conditional logistic regression was used to estimate odds ratios (ORs) with 95% confidence intervals (CIs), of the association between PSA and risk of lethal disease.
Results: Median PSA (ng/mL) among controls was 1.10 for men aged 60, 1.51 for men aged 65, and 1.52 for men aged 70. The 90th percentile of PSA levels among controls was 3.97 for men aged 60, 5.38 for men aged 65, and 5.17 for men aged 70. Median time from blood draw to lethal event among lethal cases was 15.3 years. Risk of lethal prostate cancer was strongly associated with baseline PSA levels: ORs (95% CIs) comparing PSA in the >90th percentile vs. ≤median were 7.5 (2.9, 19.1) for men aged 60, 19.3 (4.5, 82.0) for men aged 65, and 11.4 (3.0, 44.2) for men aged 70. 87% of lethal cases were in men with baseline PSA above the median (Table 1).
Conclusions: Pre-diagnostic PSA level at age 60–70 strongly predicts future risk of lethal prostate cancer in a U.S. cohort subject to opportunistic screening. This supports risk-stratified screening, with consideration of exempting men with PSA below the median at age 60 onwards from further screening.

POD-01.05. Table 1. Proportion of lethal prostate cancers captured by percentiles of measured PSA levels at ages 60, 65, and 70

	PSA concentration (ng/mL)	Proportion of lethal prostate cancers in PSA category
Aged 60 (± 2) years at blood draw (n=50 lethal events)		
Top 10th percentile	≥3.97	48%
Quartile 4	≥2.29	62%
Above median	≥1.10	84%
Below median	<1.10	16%
Aged 65 (± 2) years at blood draw (n=30 lethal events)		
Top 10th percentile	≥5.38	63%
Quartile 4	≥2.70	73%
Above median	≥1.51	90%
Below median	<1.51	10%
Aged 70 (± 2) years at blood draw (n=29 lethal events)		
Top 10th percentile	≥5.17	66%
Quartile 4	≥2.96	69%
Above median	≥1.52	90%
Below median	<1.52	10%

PSA: prostate-specific antigen.

POD-01.06

Outcomes of an aggressive biopsy strategy in young men with prostate-specific antigen between 0.5 and 2.5

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Introduction: Prostate cancer (PCa) detection has increased over previous years with the widespread use of prostate-specific antigen (PSA). Incidence rates have also increased in younger men (<50 years). Longitudinal cohort studies and urological guidelines demonstrate that PSA ≥1 in young patients under 50 confer an increased risk of PCa metastases or death several decades later. As a result of this, we have adopted an aggressive strategy among young patients under 50 with PSA close to 1 and above. Our objective was to examine this practice adoption and describe cancer detection rates.
Methods: A local institutional prostate biopsy database was queried for all patients under 50 who were biopsied in the last two decades. Data collected included clinical and pathological parameters. Patients were analyzed according to their specific PSA values. Multivariate logistic regression was performed to predict covariates associated with positive biopsy results.
Results: For this analysis, we eliminated patients who have had prior prostate biopsies and were left only with patients who had their first biopsy (n=199) due to either a PSA close to 1 and above, positive family history, and suspicious lesion on transrectal ultrasound (TRUS). Table 1 demonstrates baseline clinical and biopsy pathological data. A total of 19.2% of patients were diagnosed with PCa and over a fifth of them had at least a Gleason 7 disease, with almost a third having PSA <1.5. More than half of the PCa patients had a worse disease than the Epstein criteria for active surveillance. Factors predicting PCa diagnosis in these patients (Table 2) include positive family history, PSA, and lower prostate volumes.
Conclusions: This data justifies aggressive prostate biopsy strategy for young men under 50 with a PSA close to 1 and above. Special attention should be paid to patients with family history and smaller prostates, despite low PSA levels.

POD-01.06. Table 1. Clinical and pathological data

	PSA (≤1)	PSA (1–1.5)	PSA (1.5–2)	PSA (2–2.5)	Total	p
Number of patients	56	38	57	48	199	
Mean age (SD)	45.2 (4.9)	46.4 (3.3)	45.5 (3.5)	46.7 (3.2)	45.9 (3.9)	0.185
Mean prostate volume (cc) (SD)	26.9 (10.6)	27.9 (7.5)	31.3 (9.8)	28.2 (7.5)	28.7 (9.2)	0.075
Mean number of cores taken (SD)	10.7 (1.7)	11.2 (1.2)	10.3 (1.8)	10.9 (1.5)	10.7 (1.6)	0.102
Family history of prostate cancer, n (%)	13 (23.2%)	11 (29.7%)	14 (25%)	17 (35.4%)	55 (27.9%)	0.298
Biopsy indication, n (%)						
Rising PSA	11 (19.6%)	9 (23.7%)	32 (56.1%)	35 (72.9%)	35 (72.9%)	35 (72.9%)
Significant family history	2 (3.6%)	2 (5.3%)	3 (5.3%)	0 (0%)	0 (0%)	0 (0%)
Suspicious DRE	36 (64.3%)	24 (63.2%)	19 (33.3%)	11 (22.9%)	11 (22.9%)	11 (22.9%)
TRUS lesion	7 (12.5%)	3 (7.9%)	3 (5.3%)	2 (4.2%)	2 (4.2%)	2 (4.2%)
Suspicious TRUS lesion, n (%)	26 (46.4%)	17 (44.7%)	24 (42.1%)	15 (31.3%)	82 (41.2%)	0.818
Diagnosis of cancer, n (%)	4 (7.5%)	8 (22.2%)	15 (26.8%)	10 (20.8%)	37 (19.2%)	0.071
Gleason score, n (%)						
6	4 (100%)	8 (100%)	10 (66.7%)	7 (70%)	29 (78.4%)	
7	0	0	3 (20%)	2 (20%)	5 (13.5%)	
8	0	0	0	0	0	0.738
9	0	0	1 (6.7%)	1 (10%)	2 (5.4%)	
10	0	0	1 (6.7%)	0	1 (2.7%)	
Disease worse than Epstein criteria, n (%)	2 (50%)	1 (12.5%)	9 (60%)	7 (70%)	19 (51.4%)	0.083

DRE: digital rectal exam; PSA: prostate-specific antigen; SD: standard deviation; TRUS: transrectal ultrasound.

POD-01.06. Table 2. Multivariable logistic regression predicting positive biopsy result

	p	OR	95% CI	
			Lower	Upper
Age	0.142	1.090	0.972	1.223
PSA	0.041	1.962	1.030	3.740
Positive family history	0.009	2.962	1.316	6.665
Prostate volume	0.025	0.933	0.879	0.991
Suspicious TRUS lesion	0.489	1.329	0.594	2.972

CI: confidence interval; OR: odds ratio; PSA: prostate-specific antigen; TRUS: transrectal ultrasound.

Podium Session 2: General Urology
June 26, 2017; 1250–1350

POD-02.01
Incidence, treatment, and risk of adverse birth outcomes for kidney stones in pregnancy: A population-based study

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Introduction: The contemporary incidence of symptomatic nephrolithiasis in pregnancy is unknown and there is conflicting evidence as to the risks for perinatal complications associated with stones. Our objective was to perform a population-based study to determine the incidence of nephrolithiasis in pregnancy, the risk of adverse perinatal/neonatal outcomes, and treatment trends for stones in pregnancy.
Methods: We performed a population-based, matched cohort study using Ontario's healthcare administrative databases. All pregnancies in the province from 2004–2014 were identified. The study exposure was hospital admission for nephrolithiasis during pregnancy. Each pregnancy with nephrolithiasis was matched to up to six pregnancies without nephrolithiasis based on age, region of residence, income quintile, year of cohort entry, prior births, and multiple births. The primary outcome was any adverse birth outcome (ABO) defined as preterm birth, low birth weight, and infant death. Secondary outcomes included premature rupture of membranes (PROM), pre-eclampsia, and caesarian section (C/S), as well as the type and frequency of intervention for stones in pregnancy. Logistic regression models, with generalized estimating equations, were used to assess any differences in study outcomes across the exposure groups.
Results: Of 1.39 million pregnancies identified, there were 2863 pregnancies with nephrolithiasis (0.2%), which were matched with 17 171 pregnancies without nephrolithiasis (baseline characteristics in Table 1). A pregnancy with nephrolithiasis had a significantly increased risk for ABO compared with matched pregnancies without nephrolithiasis (13.5% vs. 8.8%; odds ratio [OR] 1.62; 95% confidence interval [CI] 1.43, 1.82; p<0.0001). Pregnancies with nephrolithiasis also had a greater risk for pre-eclampsia (OR 1.42; p=0.04) and C/S (OR 1.39; p<0.0001), but not PROM.
Conclusions: Our study demonstrated an increased risk of ABO in women with a hospital admission for nephrolithiasis during pregnancy.

POD-02.01. Table 1. Baseline characteristics for pregnancies with nephrolithiasis and matched pregnancies without nephrolithiasis in Ontario between April 2004 and December 2014.

	Not exposed n=17 171	Exposed n=2863	St diff*
Age at index			
Mean (SD)	28.84 (2.16)	28.81 (5.4)	0.01
Median (IQR)	29 (25–33)	29 (25–33)	
Income quintile			
Quintile 1 (lowest income)	24.9%	24.9%	0
Quintile 2	22.0%	22.0%	0
Quintile 3	20.1%	20.1%	0
Quintile 4	19.1%	19.1%	0
Quintile 5 (highest income)	13.8%	13.8%	0
Year of index date			
2004–2006	25.1%	25.1%	0
2007–2009	28.5%	28.5%	0
2010–2012	30.0%	30.0%	0
2013–2014	16.4%	16.3%	0
Residential status			
Urban	82.2%	82.2%	0
Rural	17.8%	17.8%	0
Number of prior pregnancies			
0	47.1%	47.1%	0
1	33.6%	33.6%	0
2	13.0%	13.0%	0
3+	6.3%	6.3%	0
Multibirth (e.g., twins)			
Yes	1.5%	1.5%	0
ADG score			
Mean (SD)	7.79 (1.62)	8.71 (4.19)	0.29
Median (IQR)	8 (5–11)	9 (6–12)	
Comorbidities			
History of kidney stones	0.3%	6.1%	0.33
Hypertension	2.3%	3.5%	0.07
Diabetes	1.6%	1.6%	0
Inflammatory bowel disease	0.8%	1.5%	0.07
Gout	0.0%	0.0%	0

*St diff: standardized differences. This metric describes differences between group means relative to the pooled standard deviation; differences greater than 10% reflect the potential for meaningful imbalance. ADG: Aggregated Diagnosis Groups; IQR: interquartile rage; SD: standard deviation.

POD-02.02
Surgeon leadership in the operating room: The effects of positive and negative behaviours on surgical team performance

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Introduction: Leadership in the operating room has been widely studied, yet the effects of surgeons' leadership on team performance are not well-understood. The purpose of this study was to examine the effects of transformational, passive, abusive supervision and over-controlling leadership behaviours by surgeons on surgical team performance. We hypothesized that transformational leadership and the three negative leadership behaviours would positively and negatively influence surgical team performance, respectively.

Methods: Trained observers attended 150 randomly selected operations at a tertiary care teaching hospital, including 20 urology cases. Observers recorded instances of leadership behaviours enacted by the surgeon. Postoperatively, members completed validated questionnaires rating cohesion and collective efficacy. To test our hypotheses, regression analyses were computed with psychological safety and collective efficacy. Data were analyzed using the complex modeling function in MPlus.
Results: Surgeons' abusive supervision was negatively associated with psychological safety (unstandardized b=-0.352; p<0.01). There were no significant associations between the other three leadership types and psychological safety (p>0.05). Both surgeons' abusive supervision (unstandardized b=-0.237; p<0.01), and over-controlling leadership (unstandardized b=-0.230; p<0.05) were negatively associated with collective efficacy. Neither transformational nor passive leadership were linked with collective efficacy.
Conclusions: This study is the first to assess the simultaneous effects of surgeons' leadership behaviours on intraoperative team performance. Significant effects only surfaced for negative leadership behaviours; transformational leadership did not positively influence team performance. Surgeons' negative leadership appear to suppress the effects of transformational leadership. Educating surgeons about leadership behaviours offers the opportunity to enhance team performance.

POD-02.03

Evaluating the efficacy and safety of intravesical onabotulinumtoxinA in older patients with idiopathic overactive bladder

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Introduction: Intravesical injection of onabotulinumtoxinA (BoTN-A) is a successful and safe treatment option for patients with overactive bladder (OAB).[1] While the incidence of OAB increases with age, the bulk of clinical data on the use of BoTN-A for OAB focuses on a younger patient cohort than is observed in the general population.[2] Our aim was to evaluate the efficacy and adverse effects of BoTN-A in older adults (>65 years).
Methods: A retrospective cohort study was performed by identifying patients with idiopathic OAB who were older than 65 years at the time of their first BoTN-A injection. Ethics approval was obtained and patient data was systematically extracted, including demographics, effectiveness data, and adverse events. Patient treated between 2008 and 2016 were included. Patients with idiopathic OAB who were treated with BoTN-A before age 65 during the same time period were used as a comparison group.
Results: 141 patients had sufficient data available and were included in the final data analysis (81 patients younger than 65 years at first BoTN-A injection and 60 patients older than 65 years). Mean age of the older patient group was 71.9 years (standard deviaton [SD] 5.5 years), while the younger group was 59.7 years (SD 2.6 years). Female patients comprised a larger proportion of the younger group (86% vs. 76%). A majority of patients in each group received multiple treatments with BoTN-A. Younger patients received a mean of three treatments (interquartile range [IQR] 2–5) while older patients received a mean of two treatments (IQR 2–5). Treatment dose was increased in 61% of younger patients and 54% of older patients. Concurrent treatment with BoTN-A and oral medication (including anticholinergics or ß3-agonists) was required in 29.3% of older patients compared to 12.4% of younger patients (p<0.01). Adverse events following BoTN-A treatment were more common in the older patient group. Post-injection urinary tract infection occurred in 31.7% of older patients and 25.9% of younger patients (p<0.05). 31.7% of older patients developed post-treatment urinary retention requiring self-catheterization compared to 9.9% of younger patients (p<0.01).
Conclusions: Intravesical injection of BoTN-A is an effective treatment option in patients with OAB, but is associated with a higher incidence of adverse events in older adults. These findings may be associated with age-related bladder and detrusor muscle changes. Inclusion of urodynamics data will help further evaluate treatment outcomes in this patient group.
References:

1. Nitti VW, Dmochowski R, Herschorn S, et al. OnabotulinumtoxinA for the treatment of patients with overactive bladder and urinary incontinence: Results of a phase 3, randomized, placebo-controlled trial. *J Urol* 2013;189:2186-93. https://doi.org/10.1016/j.juro.2012.12.022
2. Wagg A, Gibson W, Ostaszkiewicz J, et. al. Urinary incontinence in frail elderly persons: Report from the 5th International Consultation on Incontinence. *Neurourol Urodyn* 2015;34:39-406. https://doi.org/10.1002/nau.22602

POD-02.04

Low risk of clean intermittent catheterization and improved treatment response in a post-hoc analysis of a diverse age group of onabotulinumtoxinA-treated patients with overactive bladder

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Introduction: We assessed the risk of clean intermittent catheterization (CIC) and efficacy and quality of life (QOL) outcomes after onabotulinumtoxinA (OBTA) 100 U treatment in a post-hoc analysis of overactive bladder (OAB) patients of diverse ages.
Methods: Data from two phase 3 trials and a post-marketing study were pooled for analysis (n=1177) and grouped by age: <40 (n=90), 40–49 (n=156), 50–59 (n=263), 60–69 (n=343), and ≥70 (n=325) years. Assessments at Week 12 post-treatment were CIC rate and duration, % change from baseline in urinary incontinence (UI) episodes/day, and proportions of patients with ≥50 and 100% UI reduction, with minimally important difference (MID; -5 points) on the King's Health Questionnaire (KHQ) domains and with a positive response (urinary symptoms 'improved'/'greatly improved') on the treatment benefit scale (TBS). Adverse events (AEs) were assessed.
Results: CIC rate was lowest in the <40 age group (1.1%) and increased slightly with age (3.2%, 5.3%, 5.3%, and 7.2% in 40–49, 50–59, 60–69, and ≥70 groups, respectively). Mean (median) CIC duration was 3 (3) and 44 (26) days in the <40 and 40–49 groups and ranged from 78 (68) to 88 (74) days in the other groups. OBTA treatment resulted in substantial % UI reductions in all groups (range -46.8 to -64.4%). High proportions of patients achieved ≥50% UI reduction in all groups (range 58.2–71.1%), and nearly half (45.6%) the patients in the <40 group achieved 100% UI reduction. Similarly, a high proportion of patients in all groups had ≥MID improvements in KHQ domains (range: role limitations 58.2–72.2%; social limitations 51.7–63.1%) and a positive TBS response (range 66.2–73.8%). Urinary tract infection was the most common AE.
Conclusions: The risk of CIC increased slightly with age in OAB patients after treatment with OBTA, but was low in all age groups and accompanied by substantial UI reductions, QOL improvements, and treatment benefit. The <40 group had the lowest CIC rate (1.1%). OBTA was well-tolerated.

POD-02.05

Randomized, controlled trial comparing narrow vs. wide focal zones for shock wave lithotripsy of renal calculi

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Introduction: Ex-vivo data on the Modulith SLK-F2 electromagnetic lithotripter Storz Medical AG (the first lithotripter on the market designed to allow for a dual focus system: narrow or wide) shows that disintegration capacity and renal vascular injury are independent of the focal diameter of the shock wave generator at the same peak positive pressure and disintegration power. The objective of this study is to compare the single-treatment success rates of narrow and wide focal zones for shock wave lithotripsy (SWL) of renal stones.

Methods: 263 patients with a previously untreated ≥5 mm radio-opaque solitary kidney stone were randomized to receive narrow- or wide-focus lithotripsy. Patients were followed with KUB X-rays and renal ultrasound at two and 12 weeks post-lithotripsy to assess stone area and stone-free status. Primary outcome was success rate, defined as stone-free or adequate fragmentation (sand or asymptomatic fragments ≤4 mm) at three months following a single SWL treatment.

Results: 130 patients were randomized to narrow-focus lithotripsy vs.133 to wide-focus lithotripsy. The overall success rates were statistically different at two weeks post-treatment (narrow 69.2% vs. wide57.1%; p=0.042) and also at three months (narrow 69.2% vs. wide 57.1%; p=0.042). For smaller stones (area <100 mm^2), there was a greater benefit with narrow-focus lithotripsy (72.6% vs. 60.3%; p=0.05). The SWL retreatment rate for the same stone was significantly higher when wide-focus was used (44.4% vs. 30.8%; p=0.023). Overall, the complication rates were comparable in both groups (narrow 23.3% vs. wide 15.9%; p=0.135); however, the narrow group required significantly fewer ancillary procedures within the initial three-month followup period (narrow 30.8% vs. wide 42.9%; p=0.042).

Conclusions: Narrow-focus lithotripsy yields better outcomes than wide-focus lithotripsy, particularly for stones <100 mm^2, with lower retreatment rates and without increase in morbidity.

POD-02.06

Understanding simple cystectomy for benign disease: A unique patient cohort with significant risks

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Introduction: Cystectomy with urinary diversion can be performed for severe refractory voiding dysfunction. The limited data in this cohort is limited to small case series. The objective is to explore complications of simple cystectomy for benign disease.

Methods: Current Procedural Terminology codes identified patients within the National Surgical Quality Improvement Program database who underwent cystectomy (2005–2014). ICD9 codes were used to classify patients with benign or malignant diagnoses. 30-day perioperative complications were identified and logistic regression analysis identified factors associated with morbidity.

Results: We identified 389 patients who had a cystectomy for benign diagnosis. 235 (60.4%) had recorded complications. The most frequently reported complication was bleeding (requiring a transfusion within 72 hours) in 150 (38.6%) patients. Other complications were wound infection (63; 16.2%), respiratory complications (29; 7.5%), wound dehiscence (8; 2.1%) renal complications (9; 2.3%), cardiovascular complications (6; 1.5%), and postoperative deep vein thrombosis (8; 2.1%). The reoperation rate was 5.7%. Four patients (1.0%) had a recorded death in the database. Diabetes (odds ratio [OR] 1.9; p=0.04) and smoking (OR 1.8; p=0.03) were associated with increased odds of any complication. Compared to those with cystectomy for malignancy, this cohort was younger, with higher American Society of Anesthesiologists (ASA) scores and chronic kidney disease (CKD) stages. In the benign cohort, fewer had chronic obstructive pulmonary disease (COPD), hypertension, or smoked, and more had preoperative wound infections (Table 1). Operative time was shorter for simple cystectomy (327 + 125 vs. 353 + 124 minutes; p=0.001) and there was no difference in postoperative hospital stay.

Conclusions: This is the first multicentre, nationwide study to examine morbidity of cystectomy for benign diseases. Our data suggest that the benign and radical cystectomy patients are different, with benign patients being younger with higher ASA class. Even for benign disease, cystectomy carries risk and patients should be counselled accordingly.

POD-02.06. Table 1. Characteristics of simple and radical cystectomy cohorts

	Simple	Radical	p
Age (yrs)	59.1 ± 16.4	68.4 ± 10.2	<0.001
BMI	29.1 ±7.6	28.5 ± 5.7	0.15
Mean ASA score	2.88 + 0.50	2.80 + 0.54	0.005
ASA score			0.02
1	2 (0.5%)	24 (0.5%)	
2	69 (18%)	1163 (25%)	
3	291(75%)	3197 (68%)	
4	26 (7%)	275 (6%)	
Diabetes mellitus	66 (17%)	940 (20%)	0.13
Cardiovascular	10 (3%)	218 (5%)	0.06
COPD	18(5%)	397 (9%)	0.007
Smoker	76 (20%)	1139 (24%)	0.03
Hypertension	201(51%)	2853(61%)	<0.001
CKD stage			<0.001
1	124 (34%)	779 (17%)	
2	122 (33%)	2056 (45%)	
3	84 (23%)	1514 (33%)	
4	23 (6%)	140 (3%)	
5	17 (5%)	33 (1%)	
Wound infection	49 (13%)	34 (1%)	<0.001

ASA: American Society of Anesthesiologists; BMI: body mass index; CKD: chronic kidney disease; COPD: chronic obstructive pulmonary disease.

Podium Session 3: Pediatrics, Reconstruction, Infertility
June 26, 2017; 1250–1350

POD-03.01

Reducing same day or delays and cancellations using the model for improvement

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Introduction: Delays and cancellations in the operating room (OR) are both costly and inconvenient. In our institution, >20% of first cases do not start on time or are cancelled. We hypothesized that patient-related factors (PF), rather than systems factors (SF), were primarily responsible for OR delays and cancellations. We employed the "model for improvement" (MFI) in an attempt to reduce these occurrences.

Methods: The MFI uses plan-do-study-act (PDSA) cycles to promote continuous process improvement (CPI). A series of cycles were instituted, involving prolonged NPO and earlier arrival, and we assessed their impacts on cancellations and on time first case starts.

Results: Delays prior to this initiative were found to be primarily related to SFs, while cancellations were almost always related to PF. After changing NPO and arrival instructions, 13/14 (92%) consecutive days started on time. 100% of 67 consecutive patients were NPO-compliant. Of these patients, three cancelled same day due to a change in their decision. All 67 families surveyed were satisfied with revised NPO and arrival instructions and nursing teachback confimed instructions were well-understood. Stakeholder engagement, however, was complex and demonstrated polarity within different care team components.[1]

Conclusions: With healthcare costs and value being increasingly scrutinized, Lean/Six sigma and the MFI have been used to promote CPI. CPI in OR start times evidenced in our study may be due to "Hawthorne effect," as this series involved a single surgeon. As a result, PDSAs are ongoing, with expansion of this methodology to other surgeons. In addition, studying changes in OR booking and scheduling, and enhancing patient and family education and buy-in are ongoing in order to maximize OR efficiency and use, as well as the sustainability of our project. Silos and inherent institutional culture represent formidable obstacles.

Reference:

1. Girotto JA, Koltz PF, Drugas G. Optimizing your operating room: Or why large, traditional hospitals don't work. *Int J Surg* 2010;8:359-67. https://doi.org/10.1016/j.ijsu.2010.05.002

POD-03.02

Glans groove, not preoperative testosterone stimulation, is the main risk factor for complications post-tubularized incised plate repair

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Introduction: The effect of preoperative testosterone stimulation (PTS) on complications following tubularized incised plate (TIP) repair remains unclear; however, components of the Glans-Urethral Meatus-Shaft (GMS)

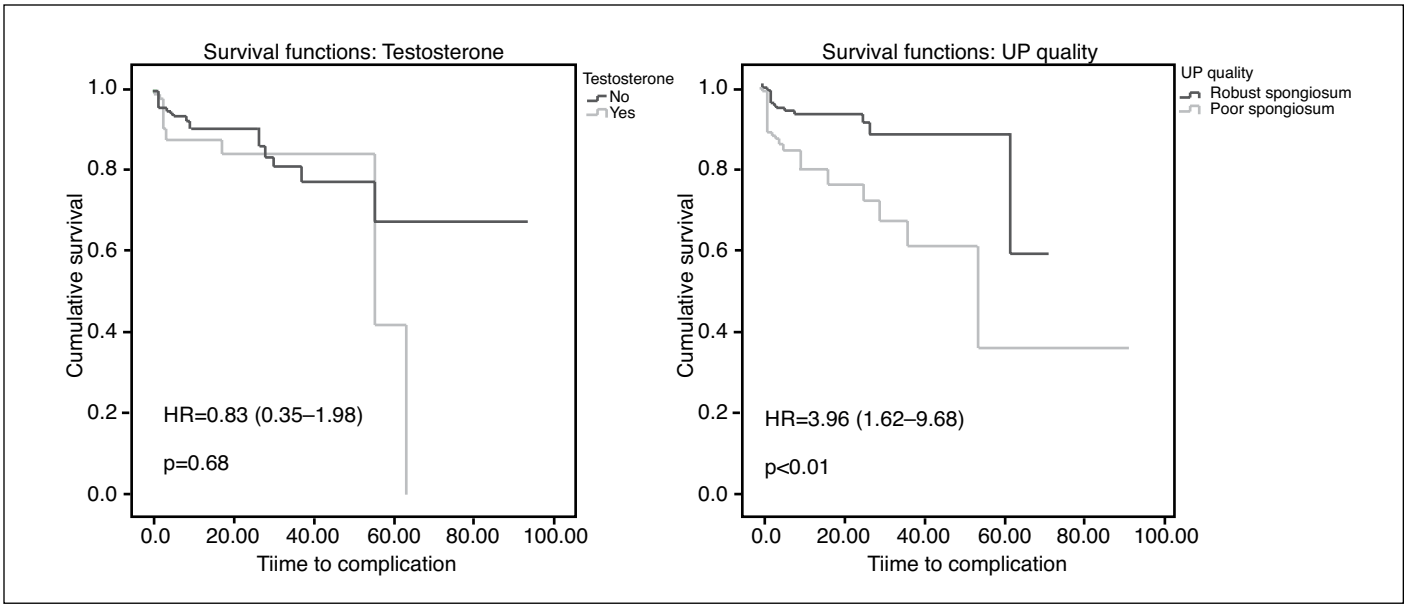

Fig. 1. POD-03.02. Cox proportion regression analysis of preoperative testosterone stimulation (PTS) and urethral plate (UP) quality. HR: hazard ratio.

POD 03.02. Table 1. Univariate and multivariable analyses of risk factors for complications post-TIP repair

	Complications n=38 (%)	Univariate		Multivariable	
		Total n=312	p	HR (95% CI)	p
Preoperative testosterone					
No	25 (11)	230	0.24		
Yes	13 (16)	82		Ref	0.81
Glans diameter				1.1 (0.4–3.3)	
>13 mm	21 (13)	163	0.69		
≤13 mm	17 (11)	149			
Meatal location					
Distal	22 (9)	236	<0.01		
Midshaft/proximal	16 (21)	76		1.5 (0.5–4.1)	0.45
Ventral curvature					
≤30	26 (10)	258	0.01		
>30	12 (22)	54			
Glans groove					
Moderate/deep	16 (8)	191	0.01		
Absent/shallow	22 (18)	121		2.8 (1.3–6.1)	0.01
Urethral plate quality					
Robust spongiosum	19 (8)	244	<0.01		
Poor spongiosum	19 (28)	68			
Anesthesia					
Caudal	35 (13)	265	0.19	2.2 (0.6–7.4)	0.24
Dorsal penile block	3 (6)	47			
GMS score at surgery					
<7	18 (9)	212	<0.01	1.6 (0.7–3.9)	0.25
≥7	20 (20)	100			

CI: confidence interval; HR: hazard ratio; TIP: tubularized incised plate.

score have been described as important risk factors. Although the correlation between meatal location and ventral curvature (VC) has been well-established, the role of urethral plate (UP) quality is debatable. Herein, we assess these covariates (glans groove, UP quality, and PTS) with TIP repair complications.

Methods: Of a prospectively collected hypospadias database (n=536), consecutive TIP repairs from 2008–2016 were selected. Staged repairs, other techniques, and redo cases were excluded. Primary outcome was postoperative complication rate (fistula, glans dehiscence, and meatal stenosis). Age at repair, modified GMS score, PTS (for glans width <14 mm), regional block (caudal vs. dorsal penile), VC, and complications were recorded. GMS score, calculated using glans groove (deep/moderate and shallow/absent), UP characteristics (robust vs. poor spongiosum), meatal location and VC (<30°, 30°–70°, >70°), ranged from 4 to 11 (worst). Student's t and Fisher's exact tests, binary logistic, and Cox proportional regressions were used for statistical analyses.

Results: Of 312 patients, 235 (75%) had distal, 48 (15%) midshaft, and 29 (9%) proximal penile hypospadias. Median age at surgery was 16 (3–171) months and mean followup was 16 ± 15 months.;82 (26%) boys received PTS and 265 (85%) had a caudal block. Mean GMS score at initial exam was higher in PTS group vs. no PTS (7.5 ± 1.6 vs. 5.4 ± 1.3; p<0.01). The mean GMS score for PTS patients decreased at surgery, but was still significantly higher than that of non-PTS (6 ± 1.4 vs. 5.5 ± 1.3; p<0.01). Overall complication rate was 12% (9% distal, 17% midshaft, and 31% proximal) and the median time to complication was 2.5 (0–63) months. Contrary to previous studies, glans width and PTS were not independently associated with complications. Logistic (Table 1) and Cox proportional regression analyses (Fig. 1) revealed a combination of glans groove/UP quality was the main independent risk factor significantly associated with TIP complications (p=0.01).

Conclusions: Previous literature has demonstrated an association between increased GMS scores and higher complication rates. Although PTS reduced GMS scores at surgery, our findings suggested that PTS, and the subsequent lower GMS score, did not significantly impact postoperative complications. Rather, glans groove depth/UP quality was the main risk factor for complications post-TIP repair.

POD-03.03

The scope and management of urethral complications after radiotherapy for prostate cancer

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Introduction: Complications arising from radiotherapy for prostate cancer are not well-defined. Our objective is to better define the scope and management of lower urinary tract complications after prostate radiotherapy.

Methods: Patients with severe urethral complications from prostate radiotherapy referred to a single urologist from December 2004 to December 2015 were reviewed. Patient demographics, signs, and symptoms were recorded, as well as the number and types of treatments. Descriptive statistics, Fishers exact test, and unpaired t-test were used to summarize clinical findings.

Results: 120 patients were identified at a mean age of 67.8 years and a mean Radiation Therapy Oncology Group (RTOG) score of 3.9. The mean time to first complication was 57.7 months (1–219) and number of complications per patient was 5.1(± 2.2). 55.8% of patients had external beam radiotherapy, 38.3% had brachytherapy, and 5.8% had combined radiation modalities. The most common complications were urethral stricture/stenosis (88.3%), refractory urgency (88.3%), incontinence (45.8%), erectile dysfunction (60.0%), and hematuria (42.5%). Other notable complications included prostate necrosis (14.2%), pubic osteomyelitis (3.3%), de novo cancer (5.8%), and rectourethral fistula (0.8%). Patients required a mean of 7.4 (1–30) treatments for radiation complications and 49.2% required major urological surgery. Procedures included urethral dilation/urethrotomy (77.5%), urethroplasty (44.2%), incontinence surgery (6.7%),

transurethral resection (43.3%), cystolithopaxy (11.7%), indwelling suprapubic catheter (13.3%), and urinary diversion (6.7%). Patients with combined radiotherapy had more complications (7.0 vs. 5.0; p=0.02) and required a higher number of procedures (10.1 vs. 7.2; p=0.08).
Conclusions: Lower urinary tract complications caused by radiotherapy are very seldom an isolated problem and require a tremendous amount of resources and urological intervention, this is particularly true for those patients with combined radiotherapy complications.

POD-03.04

Do symptoms correlate with urodynamic findings in post-prostatectomy incontinence?

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Introduction: Persistent bothersome urinary incontinence occurs in up to 10–15% of men after radical prostatectomy (RP). Urodynamics (UDS) are often used in the assessment of men with post-prostatectomy incontinence (PPI). Our objective is to determine how well patient symptoms correlate with UDS in men with PPI.
Methods: We perfromed a retrospective review of 496 men referred to our institution with PPI. All patients with a history of RP were included. All patients had a standardized history, as well as the original multichannel UDS and interpretation.
Results: 496 patients with an average age of 64 years underwent 513 studies. UDS were performed on average three years after RP. On history, 91% patients complained of stress urinary incontinence (SUI) and 48% urgency urinary incontinence (UUI). 52% of patients had only SUI, 8% only UUI, and 40% mixed urinary incontinence (MUI) symptoms. On UDS, 356 of the 471 patients with SUI symptoms had SUI for a positive predictive value (PPV) of 75%. The negative predictive value (NPV) for SUI symptoms was 78%. 6% of men with SUI symptoms on history had only detrusor overactivity incontinence (DOI) and 18% demonstrated no incontinence on UDS. PPV and NPV for UUI symptoms was 43% and 85%, respectively. Of the 42 men complaining only of UUI symptoms, 14% had only SUI, 50% had only DOI, and 17% had both SUI and DOI on UDS. 19% of men with only UUI symptoms demonstrated no incontinence on UDS. 77% of patients with MUI symptoms had SUI on UDS.
Conclusions: 91% of men in this study with PPI presented with some element of SUI symptoms on history. SUI symptoms on history accurately predicts SUI on UDS and rarely identifies only DOI. These data question the routine use of UDS in the workup of men presenting with SUI symptoms after RP prior to treatment. The complaint of UUI symptoms on history also predicts for DOI on UDS. UDS may be helpful in this patient group to further guide treatment decisions if initial treatment fails and to rule out SUI. Most men with MUI symptoms will have SUI identified on UDS.

POD-03.05. Table 1. Enrollment and followup by treatment group

Category	Number of patients	
	AMDC-USR	Placebo
Planned enrollment	164	82
Randomized and treated	93	50
Completed 1-month visit	92	50
Completed 3-month visit	93	50
Completed 6-month visit	92	50
Completed 12-month visit	91	50
Opted to receive open-label AMDC-USR	--	49
Completed 2-year visit	80	47
Remain in followup	3	--

AMDC-USR: autologous muscle-derived cells for urinary sphincter repair.

POD-03.05

Autologous muscle-derived cells for urinary sphincter repair in women with stress urinary incontinence: Results of a randomized, double-blind, placebo-controlled study

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Study Groups: Study sponsored by Cook MyoSite, Incorporated, Writing support provided by Patricia Kultgen, Cook Research Incorporated, Statistical analyses provided by Min Chen, Cook Research Incorporated.
Introduction: This multicentre study assessed the effect of autologous muscle-derived cells for urinary sphincter repair (AMDC-USR) in women with stress urinary incontinence (SUI).
Methods: Women with predominant SUI who presented with a mean incontinence episode frequency (IEF) of ≥1 stress leak/day were randomized 2:1 to receive intrasphincteric injection of 150 x 10^6 AMDC-USR or placebo and 1:1 to receive one or two treatments. Second treatments were

POD-03.05. Table 2. Baseline characteristics of AMDC-USR and placebo groups

Characteristic	AMDC-USR (n=93)	Placebo (n=50)	p
Mean age (years) ± SD (range)	51.4 ± 11.1 (24–81)	51.7 ± 9.9 (37–80)	0.89
Mean BMI ± SD (range)	26.3 ± 4.4 (19.2–34.9)	27.0 ± 3.9 (18.7–34.7)	0.30
Post-menopause (n affected)	43.0% (40)	30.0% (15)	0.15
Prior hysterectomy (n affected)	21.5% (20)	26.0% (13)	0.54
Current stage 1–2 pelvic organ prolapse (n affected)	28.0% (26)	26.0% (13)	0.85
Prior vaginal prolapse surgery (n affected)	4.3% (4)	4.0% (2)	>0.99
Pure stress urinary incontinence (n affected)	67.7% (63)	66.0% (33)	0.83
Mixed urinary incontinence, stress predominant (n affected)	32.3% (30)	34.0% (17)	0.83
Prior continence surgery (n affected)	11.8% (11)	12.0% (6)	0.98
Median number of stress leaks over 3 days (range)	12 (3–117)	15.5 (4–111)	0.17
Median 24-hour pad test (g) (range)	28.5 (4–340.2)	29.2 (4.1–416.4)	0.91
Median in-office pad test (g) (range)	11.8 (3.2 – 201.0)	15.9 (3.5–161.5)	0.29
Median IQOL score (range)	59.1 (18.2–90.9)	52.3 (3.4–88.6)	0.09

AMDC-USR: autologous muscle-derived cells for urinary sphincter repair; BMI: body mass index; IQOL: Incontinence Quality of Life; SD: standard deviation.

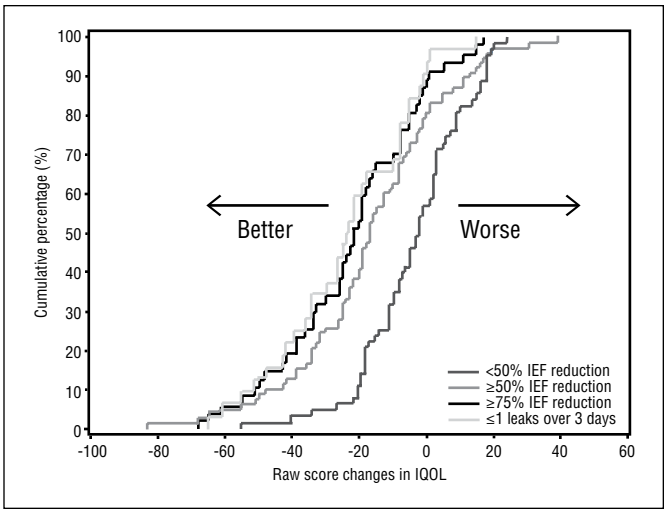

Fig. 1. POD-03.05. Cumulative distribution function plot examining Incontinence Quality of Life (IQOL) score change and incontinence episode frequency (IEF) reduction at 12 months. Results analyzed independently of treatment received.

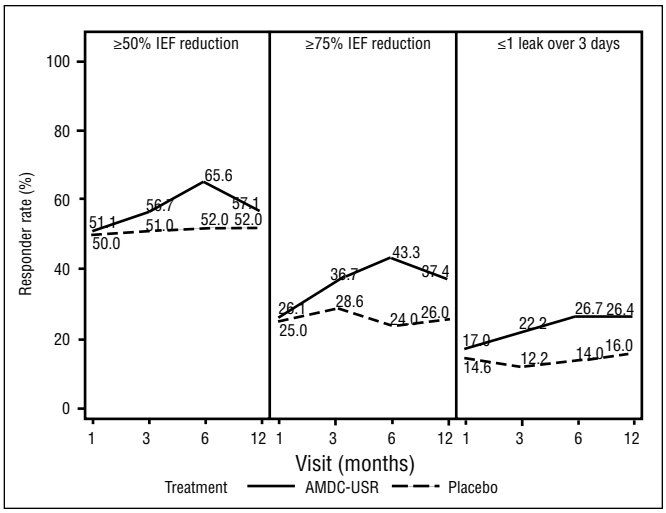

Fig. 2. POD-03.05. Percentage of autologous muscle-derived cells for urinary sphincter repair (AMDC-USR) and placebo patients with ≥50% incontinence episode frequency (IEF reduction), ≥75% IEF reduction, or ≤1 stress leak over three days.

administered six months after first treatments. At baseline and followup, three-day diaries, 24-hour pad tests, in-office pad tests, and Incontinence Quality of Life (IQOL) questionnaires were collected. The primary composite efficacy endpoint was the percentage of patients 12 months post-treatment with ≥50% IEF reduction or ≥50% reduction in either pad test. Patients were followed for two years, but were unblinded after 12-month visits. After unblinding, placebo patients received AMDC-USR.

Results: The study treated 58% (143/246) of the planned enrollment; 99% (141/143) of patients completed 12-month visits (Table 1). Enrollment was halted early due to an unexpectedly high placebo responder rate with the composite endpoint. Baseline characteristics were similar for both AMDC-USR and placebo (Table 2). No AMDC-USR safety signals were identified. Post-hoc analyses correlated IQOL score improvement with IEF reduction to identify alternate, clinically meaningful endpoints. Patients with ≥50% IEF reduction had greater IQOL score improvement than those with <50% IEF reduction, and patients with ≥75% IEF reduction or ≤1 stress leak/three days had even greater IQOL improvement (Fig. 1). With alternate IEF reduction endpoints, placebo rates were reduced and a potential treatment effect was detected (Fig. 2).

Conclusions: AMDC-USR is safe in women with SUI. The composite endpoint, which included pad tests, was too liberal to detect treatment differences between AMDC-USR and placebo; however, IEF reduction endpoints suggest efficacy.

POD-03.06

Microscopic evaluation of the vasal fluid for sperm at the time of vasectomy reversal: Do we really need to check?

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Introduction: During vasectomy reversal (VR), intraoperative microscopic evaluation of the vasal fluid for sperm presence and quality can inform of the possibility of epididymal obstruction and need for a vasoepididymostomy (VE). Despite its potential utility, the practice of intraoperative microscopic vas fluid evaluation is not universal. To validate the utility of microscopic vasal fluid evaluation, the current initiative correlates vasal fluid characteristics with sperm presence and quality in a large series of VRs.

Methods: 1108 bilateral VRs performed by a single surgeon yielded a total of 2216 vasal units for analysis. During VR, vasal fluid was expressed from the testicular end vas and the fluid was characterized (thick-paste/opaque/translucent/clear). Each aspirated sample underwent microscopic evaluation for sperm quality and categorized as: motile sperm/intact non-motile sperm/sperm parts/no sperm. The predictive utility of the gross vasal fluid characteristics with respect to sperm presence and quality was analyzed.

Results: Table 1 summarizes the relationship between the gross vasal fluid characteristics and the microscopic presence and quality of sperm. When thick-pasty fluid was observed, no sperm were seen in the samples in 50% of cases and if present, only non-motile sperm were observed. Importantly, even in the setting of more favourable vasal fluid characteristics (clear, translucent, and opaque fluid), no sperm were seen in 7–11% of cases, suggesting the possibility of epididymal obstruction and the need for a VE.

Conclusions: Intraoperative microscopic evaluation of the vasal fluid for sperm is a necessary practice during VR to optimize surgical outcomes. The gross characteristics of the vasal fluid alone does not universally predict sperm presence and quality. Reliance on vasal fluid characteristics in isolation, may lead to unrecognized epididymal obstruction, and the possible need for a VE, in approximately 10% of cases of VR.

POD-03.06. Table 1. Microscopic sperm presence and quality stratified by intraoperative vassal fluid characteristics

	No sperm	Sperm parts	Non-motile intact sperm	Motile sperm
Thick-paste	49%	42%	9%	0%
Opaque	11%	58%	24%	7%
Translucent	7%	30%	42%	21%
Clear	7%	20%	50%	23%

Podium Session 4: Other Oncology
June 27, 2017; 1105–1205

POD-04.01

Safety of minimizing intensity of followup on active surveillance for clinical stage I testicular germ cell tumours

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Introduction: The Princess Margaret Cancer Centre began recommending non-risk adapted active surveillance (AS) for all clinical stage I (CSI) testicular germ cell tumours (TGCT) in 1981. Over time, the frequency of visits, blood work, imaging, and radiation dose have been reduced in order to achieve lower cumulative radiation dose, number of lost work days for patients, and to reflect the understanding that very few relapses occur after two years. To date, the consequence of our reduced intensity surveillance has not been studied.

Methods: Our seminoma and non-seminoma TGCT AS cohorts were analyzed from 1981–2014 (allowing a minimum of two years followup). Surveillance schedules were meaningfully changed four times for non-seminoma and three times for seminoma. Primary endpoints included relapse rate, time to relapse, stage at relapse, and burden of relapse treatment during each schedule. Chi-square tests were used to examine differences between surveillance iterations.

Results: Overall, 710 seminoma and 552 non-seminoma patients underwent AS, with median followups of 6.76 and 5.21 years, respectively. Over the study period for non-seminoma, the number of computed tomography (CT) scans decreased from 11 to five, and chest X-rays from 27 to 0. For seminoma, the number of CT scans decreased from 20 to 10, and chest

POD-04.01. Table 1. Relapse data for clinical stage 1 seminoma and non-seminoma patients

Non-seminoma

Schedule iteration	1981–1985 (n = 53)	1986–1989 (n = 62)	1990–2009 (n = 329)	2010–2016 (n = 108)	p
Number relapsed n (%)	25 (47.2)	21 (33.9)	83 (25.2)	23 (21.3)	0.0023
Median (range) time from orchiectomy to relapse (months)	6.67 (2.63–148.99)	7.36 (3.06–327.82)	7.75 (1.87–75.53)	4.14 (2.33–26.78)	0.0290
N at relapse n (%)					
N0	7 (28.0)	5 (23.8)	17 (20.5)	6 (26.1)	
N1	10 (40.0)	7 (33.3)	40 (48.2)	9 (39.1)	0.0510
N2	3 (12.0)	5 (23.8)	24 (28.9)	8 (34.8)	
N3	2 (8.0)	2 (9.5)	2 (2.4)	0 (0.0)	
Unknown	3 (12.0)	2 (9.5)	0 (0.0)	0 (0.0)	
M at relapse n (%)					
M0	21 (84.0)	16 (76.2)	62 (74.7)	17 (73.9)	
M1a	4 (16.0)	5 (23.8)	18 (21.7)	6 (26.1)	0.9483
M1b	0 (0.0)	0 (0.0)	3 (3.6)	0 (0.0)	
Unknown	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
S at relapse n (%)					
S0	7 (28.0)	6 (28.6)	36 (43.4)	9 (39.1)	
S1	17 (68.0)	14 (66.7)	40 (48.1)	14 (60.9)	0.3897
S2	0 (0.0)	1 (4.8)	6 (7.2)	0 (0.0)	
S3	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	
Unknown	1 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)	
IGCCCG class n (%)					
Good	24 (96.0)	20 (95.2)	74 (89.2)	23(100.0)	
Intermediate	1 (4.0)	1 (4.8)	5 (6.0)	0 (0.0)	0.8574
Poor	0 (0.0)	0 (0.0)	4 (4.8)	0 (0.0)	
Unknown	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Modes of therapy required n (%)					
Single mode	10 (40.0)	6 (28.6)	20 (24.1)	4 (17.4)	0.3227
Multimodal	15 (60.0)	15 (71.4)	61 (73.5)	19 (82.6)	
Unknown	0 (0.0)	0 (0.0)	2 (2.4)	0 (0.0)	

IGCCCG: International Germ Cell Cancer Collaborative Group.

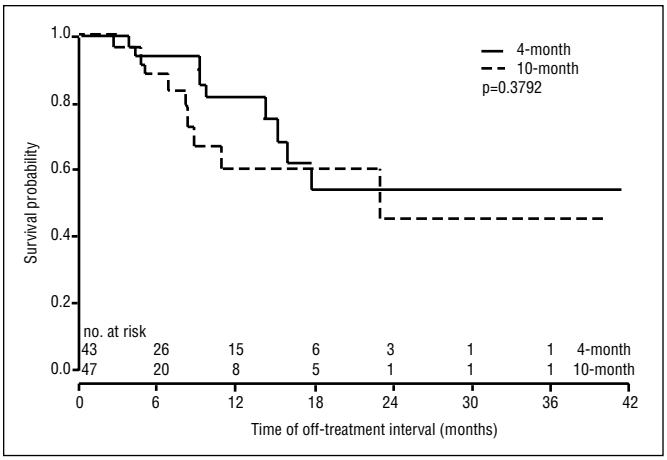

Fig. 1. POD-04.02. Median time of off-treatment intervals at 4 and 10 months.

X-rays from 13 to four. For both cohorts, the relapse rate decreased over time, with no increase in stage or treatment burden at relapse (Table 1). For seminoma, there appeared to be a decrease in N, M, and S stages at relapse. On the most recent schedules, 100% of seminoma and 82.6% of non-seminoma patients were cured with monotherapy only.
Conclusions: After substantial reductions in the intensity of AS and radiation exposure over time in our CSI TGCT AS protocols, we observed no significant change in the ability to detect relapse, the severity of relapse, or the burden of treatment upon relapse. This suggests our reduced intensity schedules are sufficiently safe for active surveillance.

POD-04.02

Four vs. 10 months of induction androgen-deprivation therapy for intermittent therapy (the FIT trial): A prospective Canadian Urology Research Consortium randomized trial

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Study Groups: Canadian Urology Research Consortium. This study was funded by a grant from Ferring Canada.
Introduction: Intermittent androgen-deprivation therapy (IADT) is widely used for the treatment of men with prostate cancer. However, the optimal duration of ADT induction is unknown. IADT induction varies from 3–12 months in phase 2 and 3 studies, but different periods of induction have never been compared prospectively. This is the first report of a prospective, randomized, multicentre Canadian Urology Research Consortium (CURC) trial comparing the effect of four months vs. 10 months of degarelix induction on the length of the off-treatment interval in men with biochemical failure.
Methods: This was a prospective, open-label, multicentre, randomized trial. 101 patients were enrolled, and 91 were randomized between four and 10 months of degarelix. Eligible patients had biochemical recurrence after definitive local therapy with surgery or radiation, a rising prostate-specific antigen (PSA) >5.0, and no bone metastases. Patients were stratified for PSA < or >10, and Gleason score ≤ or >7. The primary endpoint was the time until PSA reached 5.0 during the off-treatment interval.
Results: The median age was 75, and median PSA was 12. There was no difference between the two groups in median age, PSA, body mass index (BMI), racial distribution, Gleason score, T stage, Eastern Cooperative Oncology Group (ECOG), smoking history, or baseline testosterone. The median time off treatment was 22.8 months. There was no difference between four and 10 months of ADT induction in the median off-treatment interval (p=0.38) (Fig. 1). PSA nadir <0.1, but not baseline PSA ≤ or >10, predicted for more prolonged time off treatment. There was no difference in time to testosterone recovery between the groups (median 7.2 months).
Conclusions: There was no difference in the duration of the off-treatment interval between the four- and 10-month groups. This study suggests that a shorter course of ADT induction offers comparable benefit with respect to the duration of the off-treatment interval in men with PSA failure and may reduce the side effects and costs of ADT.

POD-04.03

Long-term followup of small renal masses: A prospective cohort study

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Introduction: Active surveillance (AS) has become the preferred treatment for small renal masses (SRM) in elderly and the infirm. The vast majority of data comes from small retrospective series with short-term followup. We report the natural history of SRM in patients with a five-year median followup.
Methods: This prospective cohort included patients undergoing AS for SRMs diagnosed between 2001 and 2011 in Nova Scotia. Age, sex, symptoms at presentation, diameters at diagnosis (cm), tumour location (central, peripheral), degree of endophytic component (1–100%), tumour consistency (solid, cystic), and renal mass biopsy were evaluated. Outcomes observed included progression to treatment or metastatic disease and death, as well as tumour growth rate and its predictors.
Results: Of the 324 patients in the initial cohort, 103 patients with 107 SRMs were included in our analysis. Median followup time for patients on continued AS was 59.2 months and the median maximum diameter and volume at diagnosis were 2.1 cm (min 0.7 cm, max 6.6 cm) and 4.8 cm^3 (min 0.1 cm^3, max 129.7 cm^3), respectively. 1.9% of patients developed metastatic disease. In total, 45.6% of the population died from other causes and 1.9% died from kidney cancer. Of the patients on continued AS, 51.5% were alive without metastatic disease and 1.0% were alive with metastatic disease. The average growth rate of all SRMs was 6.2 cm^3/year (standard error=2.2 cm^3/year), with an average volume at diagnosis of 9.3 cm^3 (p=0.0043). Tumour growth rate was significantly different between peripheral and central SRMs (p=0.0007), with peripheral masses growing at a rate of 1.75 cm^3/year (volume at diagnosis=7.9 cm^3) and central masses growing at a rate of 17.3 cm^3/year (volume at diagnosis=11.4 cm^3). Tumour growth rate of SRMs that were ³3 cm at diagnosis was approximately 15 times greater than masses that had an initial diameter of <1 cm (23.5 cm^3/year vs.3.0 cm^3/year; p=0.0067).
Conclusions: In this cohort with a median followup of five years, 45.6% of patients died from other causes and only 1.9% developed metastatic disease. This demonstrates that AS is the preferred treatment for patients who are elderly or infirm. Tumour growth rate can be predicted by initial tumour size and tumour location.

POD-04.04

Dense dose combination of methotrexate/vinblastine/doxorubicin/cisplatin vs. gemcitabine/cisplatin in patients with cT3-4a bladder cancer treated with radical cystectomy: A real-world experience

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Introduction: Level I evidence supports the utility of neoadjuvant chemotherapy (NAC) for muscle-invasive bladder cancer (BCa). Although this evidence is derived primarily from phase 3 trials that used the combination of methotrexate/vinblastine/doxorubicin/cisplatin (MVAC) or cisplatin/methotrexate/vinblastine (CMV), the alternative and less toxic regimen gemcitabine/cisplatin (GC) is currently used more commonly for NAC. Since dose dense (ddMVAC) has mostly replaced traditional MVAC, we aimed to compare pathological response and survival rates in patients with locally advanced BCa receiving ddMVAC vs.GC.
Methods: We retrospectively reviewed records of patients with urothelial cancer who received NAC and underwent cystectomy at 19 contributing institutions from 2000–2015. Patients with cT3-4aN0M0 were selected for this analysis. The primary outcome was pathological stage at cystectomy. The rates of pT0N0 and ≤pT1N0 were compared between GC and ddMVAC regimens. Univariable and multivariable analyses were used to determine factors predictive of pT0N0 and ≤pT1N0 stage. Two multivariable Cox proportional hazards regression models for overall mortality were also generated using preoperative and postoperative data.
Results: Of patients undergoing NAC and RC during the study period, 319 met our inclusion criteria. A significantly lower rate of pT0N0 was observed in the GC arm compared to ddMVAC (14.6% vs. 28.0%; p=0.005). The rate of ≤pT 1N0 was 30.1% for GC compared to 41.0% for ddMVAC (p=0.07). The Kaplan-Meier mean estimates of overall survival for GC and ddMVAC patients were 4.2 and 7.0 years, respectively (p=0.001). In multivariable Cox regression analysis based on preoperative data, GC patients were at higher risk of death compared to ddMVAC patients (hazard ratio [HR] 2.12; 95% confidence interval [CI] 1.29–3.50; p=0.003). Presence of lymphovascular invasion (HR 2.03; 95% CI 1.19–3.47; p=0.009) and hydronephrosis (HR 2.18; 95% CI 1.44–3.30; p≤0.001) were also associated with higher risk of death.
Conclusions: In our retrospective cohort of locally advanced BCa patients, ddMVAC was associated with a higher rate of complete pathological response and improved survival when compared to GC. A clinical trial is warranted to validate these hypothesis-generating results testing the superiority of neoadjuvant ddMVAC in patients with locally advanced BCa.

POD-04.05

A propensity score analysis of radical cystectomy vs. bladder-sparing trimodal therapy in the setting of a multidisciplinary bladder cancer clinic

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Introduction: Multidisciplinary management improves complex treatment decision-making in cancer care, but its impact for bladder cancer (BC) has not been documented. While radical cystectomy (RC) is currently viewed as the standard of care for muscle-invasive bladder cancer (MIBC), radiotherapy-based, bladder-sparing trimodal therapy (TMT) has emerged as a valid treatment option. In the absence of randomized studies, we compared the oncological outcomes between patients managed by RC or TMT.
Methods: Patients seen in our multidisciplinary bladder cancer clinic (MDBCC) from 2008– 2013 were retrospectively reviewed and those who received TMT for MIBC were identified and matched, using propensity scores, to patients who underwent RC. Overall survival and disease-specific survival (DSS) were assessed with Cox proportional hazards modeling and competing risk analysis, respectively.
Results: 112 patients with MIBC were included after matching, 56 treated with TMT and 56 by RC. Median age was 68.0 years and 29.5% were cT3/cT4. At a median followup of 4.51 years, there were 20 (35.7%) deaths (13 from BC) in the RC group and 22 (39.3%) deaths (13 from BC) in the TMT group. Five-year DSS was 73.2% and 76.6%, in the RC and TMT groups, respectively (p=0.49). Salvage cystectomy was performed in 6/56 TMT patients (10.7%).
Conclusions: In the setting of an MDBCC, TMT yielded survival outcomes similar to matched RC patients. Appropriately selected MIBC patients should be offered the opportunity to discuss treatment options, including organ-sparing TMT.

POD-04.06

Phase 2 randomized trial of rectus sheath vs. epidural blockade for postoperative analgesia in bladder cancer patients undergoing open radical cystectomy: Results of a data monitoring committee-mandated interim analysis

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Introduction: Enhanced recovery after surgery (ERAS) protocols have been introduced in surgical oncology to facilitate postoperative recovery. Current ERAS guidelines suggest multimodal postoperative analgesia, including an epidural blockade, but high-level data supporting this recommendation are lacking. Here we report a data monitoring committee (DMC)-mandated interim analysis of a single-centre, phase 2, randomized trial comparing the efficacy of rectus sheath blockade (RSB) and

epidural blockade (EB) in patients undergoing open radical cystectomy for bladder cancer.

Methods: Eligible subjects were those with histologically proven urothelial carcinoma of the bladder (cTanyN1–3M0) undergoing curative intent open radical cystectomy and urinary diversion by one of two fellowship-trained urological oncologists at the University of Alberta Hospital from January 2014 to present. Subjects were randomly assigned to RSB or EB. The primary outcome was patient-controlled analgesia (PCA) total morphine consumption at 24 hours after surgery. A t-test was used to compare the primary outcome between groups ($p \leq 0.05$).

Results: The DMC-mandated interim analysis included 46 randomized subjects (EB, n=21; RSB, n=26). Baseline demographic, clinical, and pathological characteristics did not differ between groups (all comparisons, $p \geq 0.05$). PCA total morphine consumption at 24 hours after surgery was 37.8 mg in the RSB group and 43.8 mg in the EB group (between-group difference 6 mg; p=0.53). The similar PCA total morphine consumption at 24 hours after surgery met predefined criteria for futility and early closure of the trial occurred.

Conclusions: This trial showed no statistically significant difference between RSB and EB for postoperative analgesia in bladder cancer patients undergoing radical cystectomy and urinary diversion. Pending final results from the analysis of secondary outcomes, RSB may be a viable alternative to EB for postoperative analgesia in this patient population.

Poster Session 1: Reconstruction, Neurogenic Bladder, Trauma
June 25, 2017; 1600–1730

IPD-01.01
Anastomotic bulbar urethroplasty: To transect or not transect?
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Introduction: Anastomotic urethroplasty is an effective, but occasionally controversial treatment for short bulbar urethral strictures. Non-transecting variations of anastomotic urethroplasty were created in part to address this controversy. The objective of this study is to assess current outcomes of anastomotic urethroplasty and compare outcomes of transecting and non-transecting techniques.
Methods: 171 patients with complete followup underwent anastomotic bulbar urethroplasty from September 2003 to May 2016. The primary (objective) outcome was success defined as urethral patency >16 Fr on routine cystoscopy. Secondary outcome measures included 90-day complications (Clavien ≥2) and de novo sexual dysfunction. Statistical comparisons were made using Cox regression analysis and Chi-square, when appropriate.
Results: 131 patients underwent transecting anastomotic urethroplasty while 41 had a non-transecting anastomotic urethroplasty. Mean stricture length was 1.5 with a mean patient age of 43.0 years. 78.9% of patients failed prior endoscopic treatment and 2.4% failed prior urethroplasty. Overall, there was a 98.2% success rate, with a mean followup of 74.9 (± 46.7) months. 7.0% of patients experienced a 90-day postoperative complication of Clavien ≥2. When comparing transecting and non-transecting technique success using Cox regression analysis, there was no difference in urethroplasty success (97.7% vs. 100%; p=0.63) and no difference in postoperative complications (7.7% vs. 4.9%; p=0.73), but patients undergoing transecting anastomotic urethroplasty were more likely to report an adverse change in sexual function (13.1%; vs. 0%; p=0.013).
Conclusions: Anastomotic urethroplasty remains a highly effective treatment for short-segment bulbar urethral strictures with relatively minimal associated morbidity. Newer non-transecting anastomotic urethroplasty techniques appear to compare favourably in the short-term and may reduce the risk of associated sexual dysfunction.

IPD-01.02
Outcomes of single-stage urethroplasty for long, multisegment anterior urethral strictures: A tale of two tissues?
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Study Groups: Dr. WH Lakey Urology Fund Endowment.
Introduction: Long, multisegment urethral strictures are a reconstructive dilemma. Increased stricture length is often associated with urethroplasty failure and reconstruction of strictures 6–12 cm often requires either two buccal mucosal grafts (BMGs) or one penile fasciocutaneous flap (PFF). Our aim is to critically assess outcomes of urethroplasty for 6–12 cm multisegment urethral strictures and assess factors affecting these outcomes.
Methods: Patients undergoing single-stage anterior urethroplasty for 6–12 cm urethral strictures from January 2004 to September 2015 were analyzed. Patients undergoing staged urethroplasty, lichen sclerosus strictures and panurethral strictures (>12 cm) were excluded. Primary outcome measure was urethral patency and secondary outcome measures were 90-day complications, sexual dysfunction, and patient satisfaction. Failure was defined as a lumen <16 Fr on routine cystoscopy. Descriptive statistics and Cox regression analysis were used for analysis.
Results: 94 patients with a mean age of 45.5 years and average stricture length of 7.8 cm were analyzed. 90.4% of patients failed prior endoscopic treatment, while 16.0% failed prior urethroplasty. 88.3% of patients underwent urethroplasty using two BMGs, while the remainder had reconstruction using a PFF. Overall success was 85.1%, with a mean followup of 66.3 months. 90-day complications, patient satisfaction, erectile dysfuction, and ejaculatory dysfunction were 7.4%, 97.1%, 6.4%, and 4.3%, respectively. Technique was not associated with success (p=0.67), complications (p=1.0), or sexual dysfunction (p=1.0). On univariate and multivariate Cox regression analysis, increasing patient comorbidity (hazard ratio [HR]1.5; 95% confidence interval [CI] 1.0–2.2; p=0.03) and infectious strictures (HR 4.3; 95% CI 1.1–16.0; p=0.03) were associated with urethroplasty failure, whereas tissue source, patient age, obesity, and prior treatment were not.
Conclusions: Single-stage reconstruction of long, multisegment urethral strictures yields satisfactory outcomes. Patient comorbidity and stricture etiology most influence urethroplasty success in this population.

IPD-01.03
Incidence and predictors of complications due to urethral stricture in patients awaiting urethroplasty
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Introduction: Urethroplasty is a definitive treatment for many refractory urethral strictures; however, patients often wait a significant period of time for surgery and incur further risk of complications due to urethral stricture. The objective of this study is to examine the incidence and predictors of complications due to urethral stricture in patients awaiting urethroplasty.
Methods: A single-centre, retrospective chart review of patients undergoing urethroplasty from 2009–2013 was performed. The primary outcome was complications, defined as any unplanned interaction with the healthcare system due to the urethral stricture during the period between decision for surgery and urethroplasty. These included urinary tract infection (UTI), urolithiasis, acute urinary retention (AUR), pain, and catheter-related issues. Patients outside of the regional health authority were excluded to minimize missed complications.
Results: 276 patients were identified for analysis. Mean stricture length was 4.5 cm and most were in bulbar (67.4%) and penile (15.2%) locations. Idiopathic (47.8%), traumatic (15.9%), and iatrogenic (10.9%) were the most common stricture etiologies. Overall, 15.9% of patients presented with a complication with a mean time to complication of 65.9 days. The mean surgical wait time was 164 days. Complications included UTI (56.8%), AUR (20.5%), genitourinary pain (5.8%), and catheter-related issues (15.9%). Univariate analysis for factors predicting complications yielded catheter status (clean intermittent catheterization or suprapubic catheter) (p<0.001) and number of prior endoscopic treatments (p=0.005) as significant, with prior urethroplasty (p=0.06) trending towards significance. Multivariate analysis found catheter status (p<0.001; odds ratio [OR] 2.3; 95% confidence interval [CI] 1.5–3.4) and prior urethroplasty (p=0.013; OR 1.7; 95% CI 1.1–2.5) to be significant predictors of complications
Conclusions: Our study is the first to examine and quantify the morbidity of urethroplasty wait times. Approximately 16% of patients presented with a complication while awaiting urethroplasty at a mean of 66 days after the decision for surgery. The optimal urethroplasty wait time should be less

than 66 days and patients with prior urethroplasty and catheters at time of surgical decision should be prioritized, as they may be more likely to develop complications.

IPD-01.04

Outcomes in the first year following transvaginal and abdominal pelvic organ prolapse repair

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Introduction: We evaluated satisfaction, quality of life (QOL), and additional treatments after transvaginal (TV) and abdominal (ABD) pelvic organ prolapse (POP) repair.

Methods: Adult women enrolled in a prospective POP database were reviewed. Baseline and outcomes data one year after surgery were collected from validated Pelvic Floor Distress Inventory (PFDI) and mailed surveys, and analyzed with descriptive statistics, Fishers exact, and two sample t-tests.

Results: 222 patients were identified; 147 (66%) had TV and 75 (34%) had ABD repair. TV patients were older (mean 64.1 vs. 59.7 years; p=0.003), but no differences in other characteristics were identified. Preoperative mean anterior (TV 2.7 vs. ABD 3.1; p=0.003) and apical (TV 2.1 vs. ABD 3.1; p<0.001) POP grades were more severe in the ABD patients compared to the TV patients. Baseline PFDI scores, however, were similar between groups (TV 115.8 vs. ABD 111.6; p=0.605). One-year PFDI scores were improved in both groups, though were significantly higher in the TV group (45.6 vs. 32.6; p=0.032). Absolute score improvement did not differ (TV -67.6 vs. ABD -76.1; p=0.353). The majority of patients in both groups reported moderately or markedly improved overall symptoms (TV 79/101 [78%] and ABD 51/59 [86%]; p=0.199) and QOL (80/101 [79%] and 51/59 [87%]; p=0.252). Similar proportions of patients (TV 52/109 [48%] vs. ABD 21/62 [34%]; p=0.108) had additional POP treatments, including pelvic floor physical therapy, coping strategies, and surgical procedures. There was no difference in rates of additional surgical treatments for prolapse between groups (TV 32/109 [29%] vs. ABD 10/62 [11%]; p=0.053). Most TV and ABD patients were satisfied (68/101 [68%] and 48/59 [81%]; p=0.055, respectively) and would recommend to a friend (85/99 [86%] and 55/57 [96%]; p=0.052).

Conclusions: Although symptoms, satisfaction, and QOL improve after both TV and ABD prolapse repair, women seek additional treatments as early as the first year after surgery.

IPD-01.05

Conservative management of renal trauma in the severely injured patient: A 10-year experience at a Canadian level 1 trauma centre

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Study Groups: Alberta Trauma Registry.

Introduction: Contemporary renal trauma data from Canada is lacking. Conservative management of renal trauma has historically been a mainstay of care and has continued to increase in prevalence. Our purpose is to describe 10-year outcomes of renal trauma at a Canadian level 1 trauma centre using a predominantly conservative approach.

Methods: The Alberta Trauma Registry at the University of Alberta was used to identify renal trauma patients from October 2004 to December 2014. Hospital records and diagnostic imaging were reviewed to identify the need for intervention related to renal injury. Clinical, demographic and radiographic factors examined included patient age, gender, length of stay, injury severity score (ISS), revised trauma score (RTS), American Association of the Surgery for Trauma (AAST) grade, computed tomography (CT) findings (laceration length/number, perinephric hematoma, intravascular contrast excretion, devitalized segment status), length of stay, transfusion and death rates. Descriptive statistics, Chi-square, and t-tests were used, when appropriate.

Results: 368 renal traumas were identified during the study period. Mechanism of injury was blunt trauma in 89.1% of cases. Mean patient age was 36.2 years and the mean ISS was 30.8 (± 13.6). 28.3% of patients required transfusion and 5.4% of patients died as a result of injuries. AAST grade distribution was Grade 1 (16.6%), Grade 2 (22.8%), Grade 3 (36.4%), Grade 4 (20.9%), and Grade 5 (3.3%) with no difference between blunt and penetrating trauma (p=0.36). Overall, 9.5% (35) of patients required intervention for renal trauma for a total of 40 treatments, including ureteral stenting (35%), angiographic embolization (35%), nephrectomy (22.5%), renorraphy (5%), and a percutaneous drain (2.5%). Patients with penetrating trauma were more likely to undergo urological intervention (20.0% vs. 8.2%; p=0.04). Patients with penetrating trauma were also more likely to be younger (p=0.009), male gender (p=0.002), have lower injury severity scores (p<0.001), and have a shorter length of stay (p=0.03). No Grade 1 or 2 injuries required intervention, while 1.5%, 31.2%, and 75.0% of Grades 3, 4, and 5 injuries did, respectively. 12 patients (3.3%) required delayed intervention, which did not differ by mechanism of injury (p=0.63). The overall renal salvage rate was 97.6%, which did not differ by mechanism of injury (p=0.25). 97.5% of patients had associated injuries, most commonly basal skull fractures (27.7%), injury of the heart or lungs (30.4%), and rib fractures (42.9%).

Conclusions: The trend towards conservative treatment of renal trauma appears well-supported in this Canadian series, as over 90% of patients avoid intervention, with a renal salvage rate of 97.6%.

MP-01.01

Mitomycin-C and urethral dilatation: A safe, effective, and minimally invasive procedure for recurrent vesicourethral anastomotic stenoses

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Introduction: We aimed to report the safety and efficacy of mitomycin-C (MMC) injection followed by urethral dilatation for the treatment of recurrent vesicourethral anastomotic stenosis (VUAS) post-radical prostatectomy (RP), and to report the final outcome for those patients treated for their concomitant post-prostatectomy incontinence (PPI).

Methods: Among patients evaluated for PPI at our institution, 29 were diagnosed with recurrent VUAS. They were recruited in a longitudinal case series pilot study between March 2009 and January 2014. Under sedation, MMC was injected at the three, six, and nine o'clock positions, followed by urethral dilatation to 26 F, with a Foley catheter inserted for three days. Followup cystoscopies were performed at two, six, 12 months, at the time of anti-incontinence surgery, and thereafter according to clinical symptoms. Patients who failed one MMC injection had the possibility to receive a second MMC injection if recurrence was noted. Patients with resolved VUAS were evaluated and offered an anti-incontinence surgery.

Results: Median (interquartile range [IQR]) patient age was 67 years (63–72). 17 patients had ≥2 prior treatments for the VUAS (median 2, IQR 1–3 treatments). 23 patients (79%) had a patent bladder neck at the 12 months followup cystoscopy after a single MMC injection and dilatation. Three patients opted for a second MMC injection for recurrence and two of those were salvaged, improving the success rate to 86%. No adverse events were reported. 20 patients (69%) opted for an anti-incontinence surgery, with all patients either cured or improved of their incontinence at their last followup visit (median followup 58 months, IQR 48–77 months).

Conclusions: MMC injection combined with urethral dilatation is a safe, effective, and minimally invasive treatment option for recurrent VUAS after RP, and provides favourable long-term results following anti-incontinence procedures.

MP-01.02

Complications and interventions in patients with artificial urinary sphincters

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Introduction: The artificial urinary sphincter (AUS) is the most widely known treatment for male stress urinary incontinence. We sought to characterize long-term rates of AUS revision/removal and reimplantation and associated risk factors.

Methods: We conducted a population-based, retrospective, cohort study of all male patients who underwent AUS implantation from 1994–2013 in Ontario. Hospital procedure codes and physician billing codes were used to identify patients who had initial AUS treatment and a subsequent revision/removal or reimplantation. The Kaplan-Meier method and multivariable Cox proportional hazards models were used to examine the cumulative incidence of AUS reimplantation and revision/removal and to identify risk factors, respectively.

Results: A total of 1632 male patients underwent implantation of AUS between 1994 and 2013. Overall, 10-year AUS reimplantation and revision/removal-free survival rates were 73.3% and 65.7%, respectively. Pre-implantation radiotherapy was not significantly associated with the risk of AUS reimplantation (p=0.17) or revision/removal (p=0.95). The risk of AUS reimplantation was significantly lower for patients who underwent AUS insertion at a hospital in the highest volume quartile of AUS surgeries (hazard ratio [HR] 0.55, 95% confidence interval [CI] 0.37–0.82). Increasing comorbidity was associated with an increasing risk of AUS removal/revision (p=0.0008). Patients' age at the time of implantation, region of residence, income quintile, and hospital type (academic vs. community) were not significantly associated with AUS reimplantation or revision/removal.

Conclusions: Most men who undergo AUS placement will still have a device in situ, without repeat surgeries, at 10 years following insertion. Radiotherapy does not appear to increase the risk of repeat surgeries. High-volume centres have the lowest rates of reimplantation and patients with increasing morbidity have the highest risk of removal /revision. Other clinical and epidemiological data do not appear to predict the risk of these outcomes.

MP-01.03

Complications after minimally invasive sacrocolpopexy with and without concomitant incontinence surgery

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Introduction: Concomitantly performing a prophylactic Burch procedure to treat occult urinary stress incontinence at the time of open sacrocolpopexy for pelvic organ prolapse has been shown to be beneficial. This benefit has been generalized to concomitant incontinence procedures (e.g., midurethral slings) at the time of minimally invasive sacrocolpopexy (MISCP), despite a lack of evidence regarding the associated risks.

Methods: Patients undergoing MISCP with and without a concomitant incontinence procedure between 2006 and 2015 were identified in the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database using relevant Current Procedural Terminology codes. The main outcome of interest was a composite of surgical site infection (superficial, deep incisional, or organ/space), bleeding requiring blood transfusion, return to the operating room within 30 days, and surgical stay >48 hours. Stratification and regression modeling were used to identify independent risk factors for the outcome and to generate adjusted effect measures for variables of interest.

Results: 7097 women met the inclusion criteria, of which 2433 (34%) underwent a concomitant incontinence procedure. Patients undergoing a concomitant incontinence procedure were slightly older (59 ± 11 vs. 58 ± 12 years; p<0.0001) and had longer total operating time (225 [interquartile range (IQR) 170–267] vs. 184 [IQR 120–232] minutes; p<0.0001). A greater proportion of concomitant incontinence procedures were performed by gynecologists compared to urologists (35% vs. 28%; p=0.002). Multivariable regression identified steroid use, wound class III or IV (vs. I or II), and having a longer operative time as independent predictors of the outcome. After adjusting for baseline patient characteristics and comorbidities, no association was observed between concomitant incontinence procedure and the outcome (adjusted relative risk 0.99, 95% confidence interval 0.71–1.38).

Conclusions: In this large database study, despite being associated with a longer operative time, performing a concomitant incontinence procedure at the time of MSCIP was not associated with an increased risk of surgical complications.

MP-01.04

Perinephric hematoma size is independently associated with the need for urological intervention in blunt renal trauma

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Study Groups: AHS Surgery Strategic Clinical Network Summer Surgical Research Studentship (SSRS) Award.

Introduction: Although the American Association of the Surgery for Trauma Organ Injury Scale (AAST-OIS) can help predict the need for urological intervention, this grading system does not include other potentially important factors, such as devitalized renal fragments, laceration location, and perinephric hematoma characteristics. The objective of this study is to examine predictors of urological intervention in the setting of blunt renal trauma.

Methods: The Alberta Trauma Registry was used to identify renal trauma patients at the University of Alberta from October 2004 to December 2014. Penetrating trauma and patients without complete datasets were excluded from analysis. Hospital records and diagnostic imaging were reviewed to identify the need for intervention related to the renal injury, including ureteral stenting, percutaneous drainage, angiographic embolization, nephrectomy, or renorraphy. Clinical and radiographic factors examined included patient age, gender, length of stay, injury severity score (ISS), AAST-OIS grade, laceration length/number, perinephric hematoma characteristics (number, length, location, area), intravascular contrast excretion (ICE), and devitalized segment status. Descriptive statistics and binary logistic regression were performed, where appropriate.

Results: 328 patients with blunt renal trauma met study criteria. Mean patient age was 37.0 years with a mean ISS of 31.7. 27 patients (8.2%) required a total of 31 interventions, including ureteral stenting (12/31; 38.7%), angiographic embolization (10/31; 32.3%), nephrectomy (7/31; 22.6%), renorraphy (1/31; 3.2%), and percutaneous drainage (1/31; 3.2%). On univariate analysis, AAST grade (p<0.001), hematoma diameter (p<0.001), hematoma area (p<0.001), ICE (p<0.001), laceration length (p<0.001), laceration number (p<0.001), devitalized fragment presence (p<0.0001), and degree of devitalization (p<0.001) were associated with the need for intervention. On multivariate regression analysis, only AAST grade (p<0.001; odds ratio [OR] 69.4; 95% confidence interval [CI] 6.4–748.3), hematoma diameter (p=0.004; OR1.5; 95% CI 1.1–1.9), and/or hematoma area (p=0.012; OR 1.03; 95% CI 1.01–1.06) remained associated with the need for intervention.

Conclusions: Although the AAST-OIS is strongly associated with the need for urological intervention, perinephric hematoma diameter and area are also independently associated with this occurrence. Perinephric hematoma size should be considered during clinical decision-making and should be incorporated into a revised injury-grading system.

MP-01.05

High user satisfaction and reduction of clinical urinary tract infections using a standardized telemedicine platform in the neurogenic bladder and spinal cord injury population

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Study Groups: Rick Hansen Institue, International Collaboration on Repair Discoveries.
Introduction: Urinary tract infection (UTI) is the most frequent secondary complication following spinal cord injury (SCI).[1,2] It is associated with septicemia, resistant organisms, autonomic dysreflexia, and reduced quality of life (QOL).[3] In the SCI population, access to specialists is hampered by clinic distance, economic burden, and traveling with assisted ventilation. The SCI community prioritizes UTI as an improvement area for their healthcare.[4]
Methods: We conducted a prospective cohort study of SCI subjects at Blusson Spinal Cord Centre with two or more UTIs in a six-month period. Subjects served as own controls for six-month run in then standardized biweekly telemedicine interviews conducted for six months. At initiation and completion of interviews, validated symptom scores were performed: The Neurogenic Bladder Symptom Score, SF-36 and Qualiveen-30. Feasibility assessment included: completed visits, satisfaction survey, and software functionality. The subjects were instructed on telemedicine operation, urine dipstick, blood pressure, and temperature values. UTI incidence was tracked pre- and post-intervention.
Results: A total of 49 SCI patients were included in the study (age: 23–70 years; 38 male, 11 female; 27 ASIA A, nine ASIA B, four ASIA C, two ASIA D, four spina bifida, three multiple sclerosis).Of 132 interviews 103 were completed successfully; 15 failed due to forgetfulness or internet connectivity. 69% of completed visits had good audio/video quality, 15% had poor quality. 31% required troubleshooting for: login, audio, connectivity, software, or browser challenges. Telemedicine satisfaction survey found all subjects reported that discussions on UTI prevention was helpful and they would recommend and consider it for health services. 80% agreed telemedicine increased motivation to monitor their health. The number of UTIs was reduced from 62 in control period to 24 during telemedicine.
Conclusions: UTI was frequency reduced in 80% of subjects receiving standardized care via telemedicine. Telemedicine was successful in high quadriplegics using adaptive mouth technology to operate computers.100% agreed with overall functionality of telemedicine. Improvement areas include simplified login and task reminder prompts.
References:
1. D'Hondt F, Everaert K. Urinary tract infections in patients with spinal cord injuries. *Curr Infect Dis Rep* 2011;13:544-51. https://doi.org/10.1007/s11908-011-0208-6
2. Manack A, Motsko SP, Haag-Molkenteller C, et al. Epidemiology and healthcare utilization of neurogenic bladder patients in a US claims database. *Neurourol Urodyn* 2011;30:395-401. https://doi.org/10.1002/nau.21003
3. Fonte N. Urological care of the spinal cord-injured patient. *J Wound Ostomy Continence Nurs* 2008;35:323-31. https://doi.org/10.1097/01.WON.0000319132.29478.17
4. van Loo MA, Post MW, Bloemen JH, et al. Care needs of persons with long-term spinal cord injury living at home in the Netherlands. *Spinal Cord* 2010;48:423-8. https://doi.org/10.1038/sc.2009.142

MP-01.06

The neurogenic bladder symptom score (NBSS): An assessment of its external validity and ability to detect change

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Study Groups: PCORI grant CER14092138.
Introduction: The Neurogenic Bladder Symptom Score (NBSS) has been validated as a tool to assess bladder quality of life and symptoms. The objective of this study was to externally validate the NBSS and assess responsiveness.
Methods: Data from the "Patient-reported outcomes for bladder management strategies in spinal cord injury" study was used. Adult spinal cord injury (SCI) patients were eligible for enrollment through direct recruitment or an open online portal. At the initial visit, patients completed the NBSS. Responsiveness was assessed in a separate prospective cohort of patients undergoing intradetrusor onabotulinumtoxin injection.
Results: 609 patients had complete NBSS scores. Median age was 48 years (interquartile range [IQR] 36–57), and 67% were male. The majority had thoracolumbar lesions (51%) and managed their bladder by clean intermittent catheterization (CIC) (63%). The median NBSS total score was 22 (IQR 15–30), and median quality of life was "mixed." The Cronbach's alpha of the total score was 0.85, and 0.93, 0.76, and 0.49 for the incontinence, storage/voiding, and consequences domains respectively. All item to domain correlations were moderate to strong ($r \geq 0.3$) aside from 3/7 of the items from the consequences domain. Appropriate hypothesized correlations between the NBSS domains and external variables (such as the number of prior urinary infections and the NBSS consequences domain ($r=0.51$; $p<0.01$) were observed. A separate cohort of patients with neurogenic bladder competed the NBSS pre- and post-onabotulinumtoxin injection, and the mean change scores in the domains were determined. All domains had a large to moderate effect size (total NBSS [0.91], incontinence domain [1.03], storage/voiding domain [0.69]) suggesting appropriate and clinically relevant responsiveness.
Conclusions: The NBSS demonstrated good validity in a large cohort of SCI patients. Similarly, the total NBSS score and relevant domains were responsive to change and can be used to assess the impact of an intervention.

MP-01.07

The impact of urinary tract infections on quality of life and secondary complications in the spinal cord injured population: Insights from the national Rick Hansen registry community survey

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Introduction: Urinary tract infections (UTIs) are the most frequent type of infection following spinal cord injury (SCI). We aim to 1) assess the impact of UTI on activity level/satisfaction and overall quality of life (QOL); 2) determine the frequency of secondary complications of UTI and their relationship to QOL ratings; and finally 3) identify predictors for developing frequent UTIs.
Methods: The SCI Community Survey was developed to assess major dimensions of community living and health outcomes in persons with SCI using an online survey. Answers were stratified by UTI frequency. The impact of UTI on QOL, activity, health resource use, and demographics were assessed. Bowel and urinary incontinence, constipation, spasticity, and autonomic dysreflexia were collected as indicators of secondary complications. Statistics included paired, two-tailed t-test, cross tabulations, and chi-squared test.
Results: 1124 of 1549 SCI participants experienced at least one symptomatic UTI. Those with UTI had twice as many hospitalizations and doctors' visits and were limited in social activities, vocational situation, sexual life, physical health, and ability to manage self-care as compared to those with no UTIs. UTIs were associated with higher incidence of secondary complications, including bowel incontinence, constipation, spasticity, autonomic dysreflexia, and urinary incontinence. Furthermore, we found that those who experienced secondary complications reported significantly worse QOL. Lastly, injury location and lost movement were predictors for developing frequent symptomatic UTIs.
Conclusions: UTIs have a profound impact on the QOL of patients with SCI. We hope to incorporate the identified predictors for frequent symptomatic UTIs into surveillance and management guidelines for SCI patients with UTIs.

Poster Session 2: Renal Transplantation
June 25, 2017; 1600–1730

IPD-02.01

Clips offer a safe alternative to staples for vascular control of the renal vessels during laparoscopic donor nephrectomy

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Introduction: Vascular control of the renal vessels during laparoscopic donor nephrectomy is controversial. Despite some authors concluding that using non-transfixion techniques instead of transfixion techniques to control the renal artery is "both legally indefensible and morally intolerable,"[1] many centres continue to use clips. The study objective was to review our 10-year experience using clips to control the renal vessels and determine the safety of this practice.

Methods: We performed a retrospective review of all patients who underwent a laparoscopic donor nephrectomy at our centre (January 2007 to August 2016). We recorded details of vascular control and complications. The primary outcome was complications or failures associated with vascular control of the renal vessels, which included clip dislodgement or crossing, conversion to open, additional procedures for bleeding, and blood transfusions. Secondary outcomes were changes in hemoglobin (Hb) and warm ischemia time.

Results: We included 388 patients with 444 renal arteries and 393 renal veins. 374 renal arteries (96.4%) were controlled with three titanium clips. There were four (0.36%) events where one of the three titanium clips placed on a renal artery failed, with none causing bleeding. These included one crossed clip requiring placement of a fourth titanium clip and three clip dislodgements requiring suturing distal to the clip (n=1), placing another titanium clip (n=1), and no intervention (n=1). 364 renal veins (93.8%) were controlled with two polymer locking clips, with no failures. There were no conversions to open or secondary procedures due to bleeding, blood transfusions, or donor deaths. Median warm ischemia time was 160 seconds and the median change in Hb (g/L) was 18 (preoperative to postoperative) and -1 (postoperative to discharge).

Conclusions: During laparoscopic donor nephrectomy, using three titanium clips on the renal artery(ies) and two polymer locking clips on the renal vein(s) is safe and provides excellent vascular control.

Reference:
1. Friedman AL, Peters TG, Ratner LE. Regulatory failure contributing to deaths of live kidney donors. *Am J Transplant* 2012;12:829-34. https://doi.org/10.1111/j.1600-6143.2011.03918.x

IPD-02.02

Vascular control during laparoscopic kidney donation: Practice patterns in Canada

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Introduction: In recent years, the method of vascular control during laparoscopic donor nephrectomy (LDN) has come under scrutiny due to catastrophic consequences of a device failure. This study sought to examine the surgical preferences of Canadian donor surgeons with regards to vascular control and their perception on the safety of these modalities. We also surveyed the experience with device malfunctions and their subsequent management during LDN.

Methods: An online survey was sent out to donor surgeons registered with the Canadian Society of Transplantation. Surveys were anonymous and voluntary. Descriptive statistics were used to analyze the collected responses. Recollection of the sequelae and outcomes from device malfunction were also queried.

Results: 28 of 37 surgeons (76% response rate) responded to the survey. At least one surgeon from every institution in Canada performing LDN responded to the survey. Laparoscopic stapler is the most commonly used device for securing the renal artery (61%) and renal vein (67%) (Fig. 1). Overall, surgeons felt the stapler was the safest method of securing the renal artery. Stapler misfire and clip slippage were reported by 8 (28.5%)

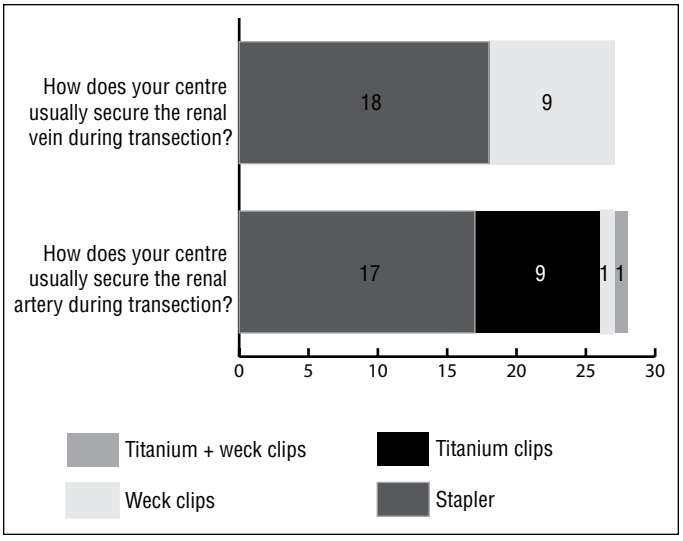

Fig. 1. IPD-02.02. Canadian practice patterns during laparoscopic kidney donations.

IPD-02.02. Table 1. Survey results

Has your centre ever experienced a stapler misfire during a laparoscopic donor nephrectomy (that you know of)?	Yes No	8 (28.5%) 20 (71.5%)
Has your centre ever experienced a stapler misfire during a laparoscopic radical nephrectomy (that you know of)?	Yes No	11 (39%) 17 (61%)
Has your centre ever had troubles/issues with surgical clips (i.e., clips falling off)?	Yes No	12 (43%) 16 (57%)
Do you think the incidence of stapler misfire is under-reported in the literature?	Yes No	23 (82%) 5 (18%)
Do you think the incidence of surgical clip malfunction is under-reported in the literature?	Yes No	26 (93%) 2 (7%)

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IPD-02.02. Table 2. Cases of salvageable device malfunctions

Device malfunction	Outcome
Stapler misfire (n=8)	Salvaged with repeat stapler fire (n=3) Salvaged with laparoscopic satinski and suture (n=2) Salvaged with conversion to open (n=1) Salvaged with hand-port (n=1) Convert to open – death (n=1)
Titanium clip falling off (n=4)	Salvaged with conversion to open (n=3) Outcome not reported (n=1)
Weck® Hem-o-lok® clip falling off (n=8)	Salvaged with conversion to open (n=2) Emergency laparotomy POD#1 (n=1) Vessel sheared, titanium clip reapplied (n=1) Outcome not reported (n=4)

and 12 (43%) surgeons, respectively (Table 1). Most cases were salvageable: laparoscopically (30%), open conversion (30%), and by hand-port (5%) (Table 2). Slippage of a plastic locking clip resulted in one emergent laparotomy on POD#1 and one stapler misfire was converted to open, resulting in donor death.

Conclusions: Although rare, hemorrhagic complications can occur from device malfunction resulting in poor outcomes for healthy volunteers undergoing LDN. Surgeons need to remain vigilant when selecting the appropriate modality for vascular control.

IPD-02.03

Donor warm ischemic time >80 minutes is an important predictor of kidney graft survival from donors after cardiac death

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Study Groups: This work was supported in part by Health Resources and Services Administration contract 234-2005-37.

Introduction: We analyzed United Network for Organ Sharing (UNOS) data to determine how donor warm ischemic time (WIT), donor body mass index (BMI), cold ischemic time (CIT), and use of vasopressin (ddAVP) in the peridonation period influenced outcomes of kidney transplants from donors after cardiac death (DCD).[1]

Methods: We evaluated all DCD kidney transplants performed in the U.S. from 1988–2013. We excluded transplants with no recorded WIT and those with incomplete values required to calculate Kidney Donor Risk Index (KDRI). In total, 11907 transplants were included in the study. The effects of donor traits on graft and recipient survival were evaluated using Cox regression and the Kaplan-Meier method. Logistic regression was used to evaluate effects on delayed graft function (DGF).

Results: Donor WIT predicted graft survival ($p<0.05$) and compared to kidneys with WIT<60 minutes, kidneys with WIT 60–79 minutes had similar rates of graft failure (hazard ratio [HR] 0.95, 95% confidence interval [CI] 0.67–1.37), whereas those with WIT ≥80 minutes had 1.66 times more failure (HR 1.66, 95% CI 1.16–2.38). One-year (90% ± 0.3%, 87% ± 2.7% vs. 82.1% ± 4.2%) and five-year (69.4% ± 0.6%, 79% ± 4% vs. 62% ± 6.8%) survival were greater with WIT<60 and 60–79, compared to WIT ≥80 minutes, respectively. Donor BMI ($p<0.0001$), organ CIT ($p<0.0001$), and ddAVP ($p<0.0001$) were all predictors of DGF. Compared to grafts from donors of BMI <20, BMI 20–29 increased DGF odds 1.5-fold (odds ratio [OR] 1.54, 95% CI 1.36–1.75), and BMI >30 doubled odds (OR 2.35, 95% CI 2.05–2.70). Compared to CIT <12 hours, DGF odds increased 1.5-fold with CIT 12–24 hours (OR 1.52, 95% CI 1.38–1.69) and doubled with CIT 24–48 hours (OR 2.26, 95% CI 2.01–2.55). DdAVP reduced DGF odds (OR 0.69, 95% CI 0.6–0.8).

Conclusions: Donor WIT and CIT are significant predictors of DCD kidney graft survival, while CIT, donor BMI, and ddAVP are predictors of DGF. DCD kidneys with WIT up to 80 minutes may be acceptable without compromising outcome; however, grafts with WIT ≥80 minutes are more likely to result in graft failure and hence should only be used in specific recipient circumstances.

Reference:

1. Based on OPTN data as of March 31, 2013.

IPD-02.04

Neuromuscular stimulation leads to improved lower limb edema, urine output, and blood flow compared to standard TED stockings and compression devices following kidney transplantation

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Introduction: Kidney transplant recipients undergo significant fluid shifts in the postoperative period, leading to significant lower limb edema. TED stockings plus intermittent pneumatic compression (IPC) devices are used to mitigate these risks; however, improper fit, discomfort, excessive heat, and sweating limit the use of TED + IPC units. The Geko Plus device, is a novel, internally powered calf neuro muscular stimulator, which has previously been shown to have beneficial effects in improving blood flow. Its role in transplantation has not been assessed. We sought to prospectively evaluate the effects of TED + IPC and Geko Plus devices on lower limb edema in renal transplant patients.

Methods: We performed a prospective, randomized, controlled, single-centre study where 93 consecutive patients were randomly assigned to wear TED + IPC (Group1, n= 50) or the Geko Plus device (Group 2, n=43) postoperatively until Day 6 after surgery. The trial met the guidelines set by the CONSORT statement. We measured patient weight and lower leg and thigh circumferences daily. Ultrasound Doppler of the allograft and of the lower limbs was carried out on postoperative Days 1 and 5 to assess femoral venous flow and velocity. We also monitored total urine output, daily serum creatinine, and patient satisfaction on Days 3 and 6 after surgery.

Results: Median recipient age was 51 (range 24–72) and 66% were male. There were no differences in recipient body mass index between groups; donor types (living or deceased) were equally distributed between them. We observed a significant increase in calf circumference following transplantation in Group 1 by 7.5% (2.3 ± 2 cm) compared to Group 2, which showed no change from baseline (0.34%, 0.05 ± 0.95 cm; $p<0.0001$). Thigh circumference also followed a similar trend, with Group 1 showing a significant increase (6%, 2.4 ± 2 cm) from baseline compared to Group 2 ($p<0.001$). Doppler ultrasound revealed an increase in mean flow velocity in the Geko Plus patients of 21 cm/s, whereas the TED + IPC group showed slower flow at 12 cm/s ($p<0.0005$). The mean total urine output in six days in Group 1 was 8800 cc, whereas in Group 2, it was 17900 cc ($p<0.05$); however, no differences were observed in serum creatinine. Patients were more satisfied with the use of Geko Plus device than TED + IPC. There were no complications as a result of the study in either group.

Conclusions: The use of the Geko Plus device in the immediate postoperative period leads to an improvement in lower limb edema, venous flow, urine output, and better patient satisfaction in kidney transplant recipients compared to standard TED + IPC.

IPD-02.05

Challenges for the travelling donor: Variability between donor workup and donor surgery in a kidney paired-donation program

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Introduction: A primary obstacle to providing renal transplantation is limited access to donated kidneys. The living donor pool for renal allografts was greatly expanded through implementation of a kidney paired-donation program. While some programs transport donor kidneys, others send living donors to the site of renal transplantation. Performing the nephrectomy and transplant at the same location may optimize functional renal outcomes, but preferred surgical approaches may differ between surgical teams performing the donor workup and donor surgery. Our objective was to identify incongruence between the surgery planned by the team that performed each donor's workup, and the surgery that took place at the site of donation.

Methods: A retrospective chart review was performed between the site of preoperative surgical planning and the site of surgery for kidney donors in the Canadian kidney paired-donation program.

Results: A retrospective chart review was performed for 51 donors that were preoperatively worked up in various Canadian provinces between 2009 and 2016, and subsequently underwent surgery in a different province. The surgical procedure performed for 31% of the patients' nephrectomies differed from the procedure suggested by the surgical team who conducted the preoperative workup. Half of these differences were between left laparoscopic and left laparoscopic hand-assisted, but the remainder included more substantial changes of side and/or laparoscopic vs. open procedures.

Conclusions: Optimal patient care may be challenged in a kidney paired-donation program that uses the 'travelling donor' approach, due to differing surgical techniques selected by the surgeon at the site of donor workup and the surgeon at the site of donation.

MP-02.01

Donor age is the most important predictor of long-term graft function in simultaneous pancreas-kidney transplantation from donors after cardiac death

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Study Groups: This work was supported in part by Health Resources and Services Administration contract 234-2005-37.

Introduction: Simultaneous kidney-pancreas (SPK) grafts from a donor after cardiac death (DCD) have been shown to be inferior to traditional donation after neurological death (NDD) grafts;[1] however, specific information is lacking on which donor characteristics should be used to judge the viability of a DCD organ. We analyzed data from the United Network for Organ Sharing (UNOS)[2] to determine the effects of donor age, donor body mass index (BMI), and organ cold ischemic time on DCD-SPK graft outcomes.

Methods: We evaluated all DCD-SPK transplants performed in the U.S. from 1988–2013. Transplants with incomplete values required to calculate pancreas and kidney donor risk indices (PDRI and KDRI) were excluded. The effects of donor characteristics on graft and recipient survival were evaluated using Cox regression and the Kaplan-Meier method. Logistic regression was used to evaluate effects on delayed graft function (DGF).

Results: We analyzed 189 DCD transplants with donors ≤40 years old, and 38 with donors >40. Overall, SPK grafts from donors >40 displayed significantly higher rates of kidney failure (hazard ratio [HR] 2.1; 95% confidence interval [CI] 1.15–3.83; p<0.05) and pancreas failure (HR 2.07; 95% CI 1.16–3.70; p<0.05) compared to grafts from donors ≤40. One-year (88.2% ± 2.4% vs. 73.4% ±7.2%) and 10-year (66.3% ± 6.9% vs. 50.3% ± 10%) pancreas survival was greater in donors ≤40. A similar trend was observed for short- and long-term kidney graft survival. Importantly, increasing donor age was associated with increased DGF (odds ratio [OR] 1.030, 95% CI 1.003–1.057; p<0.05). Increasing donor BMI was also predictive of pancreas failure (HR 1.024, 95% CI 1.007–1.042; p<0.01), recipient mortality (HR 1.022, 95% CI 1.003–1.041; p<0.05), and DGF (OR 1.119, 95% CI 1.035–1.208; p<.005). Donor age was equally as predictive of one-year graft outcomes as PDRI or KDRI. We did not observe an effect of cold ischemic time on graft outcomes.

Conclusions: Donor age and donor BMI are significant predictors of DCD-SPK graft failure, DGF, and recipient mortality. Organs from donors >40 are twice as likely to result in kidney failure and pancreas failure compared to grafts from donors ≤40.

References:
1. Salvalaggio PR, Davies DB, Fernandez LA, et al. Outcomes of pancreas transplantation in the United States using cardiac-death donors. *Am J Transplant* 2006;6(5 Pt 1):1059-65. https://doi.org/10.1111/j.1600-6143.2006.01310.x
2. Based on OPTN data as of March 31, 2013.

MP-02.02

Pediatric recipients of deceased adult donor kidneys have equivalent outcomes compared with pediatric donors

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Introduction: Pediatric deceased donor kidneys are allotted to pediatric recipients. To our knowledge, database analysis has not been performed in regards to donor age in pediatric recipients. We hypothesize that deceased donor kidneys from pediatric donors (<18 years), have better long-term graft outcomes compared to those received from adult donors.

Methods: We reviewed transplants from 2005–2010 in the United Network for Organ Sharing (UNOS) database (complete to March 2013). We identified recipients aged 17 and under, excluding recipients under four years and donors for whom Kidney Donor Risk Index (KDRI) variables were missing. Delayed graft function (DGF) and death censored graft survival (DCGS) outcome data was analyzed based on donor age ≤17 (pediatric donors, PD) compared to donors 18 and older (adult donors, AD). Matched-pair analysis was performed. Graft survival was compared

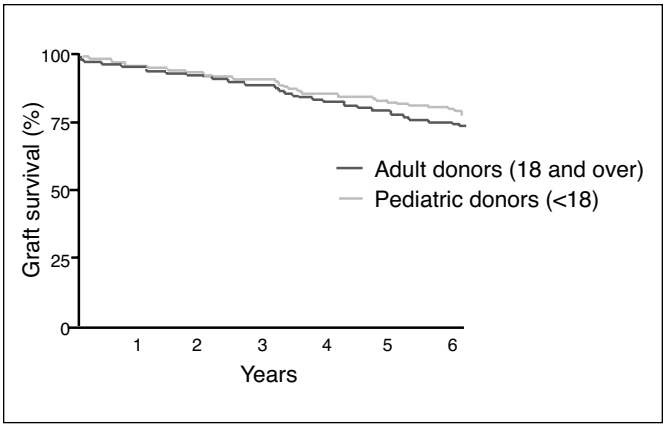

Fig. 1. MP-02.02. Death-censored graft survival.

using Kaplan-Meier curves and Cox regression multivariate analysis.
Results: Overall, 3034 pediatric kidney transplant recipients were identified. 10% were <4 years. Matched-pair analysis based on KDRI left us with 670 (26%) PD and 1878 (74%) AD. Average recipient age, sex, and other factors were similar. Mean PD age was 13.7 years (CI 13.4–14), while mean age was 24.6 years (CI 24.3–24.8). DGF was not significantly different between the two groups (11% vs. 9%), although donation after cardiac detah (DCD) adult donors have higher DGF (25% vs. 10%; p=0.04). DCGS for PD and AD were similar (p=0.08) at one year (95.2% vs. 94.9%) and median followup of 3.3 years (87.5% vs. 85.5%) (Fig. 1). Multivariate Cox regression showed that DGF (hazard ratio 2.55), as well as recipient factors were associated with graft survival.
Conclusions: Analysis of pediatric recipients of deceased renal donors shows no significant difference in DGF or graft survival when comparing pediatric and adult donors. Recipient factors and presence of DGF correlate with graft survival. Adult and pediatric deceased donors are both associated with excellent outcomes in pediatric renal transplant recipients.

MP-02.03
The impact of resistive indices in deceased donor renal transplant recipients with delayed graft function

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Introduction: Doppler ultrasonography is often carried out to determine renal allograft perfusion in the early postoperative period. An elevated resistive index (RI) is associated with acute kidney injury (AKI). We hypothesize that patients with delayed graft function (DGF) and elevated RIs and therefore AKI have a different functional outcome vs. patients with normal RIs.
Methods: We retrospectively reviewed early postoperative (<24 hours) renal allograft doppler ultrasounds for 250 renal allograft transplants. We analyzed deceased donor recipients only patients with DGF and separated those with intrarenal RIs >0.8 vs. ≤0.8. Outcomes were GFR a three months and one year (MDRD), as well as graft survival (GS). Patients with insufficient or incomplete followup data were excluded. Statistical analysis was performed using T-test and chi-squared where appropriate. Graft survival analysis was performed with Kaplan-Meier curves.
Results: In total, 69 deceased donor recipients had DGF. Of DGF patients, 48 (70%) had intrarenal RIs ≤ 0.8, while 21 (30%) had RIs >0.8. Both groups had similar proportions of donation after cardiac death (DCD) vs. donor after neurological death (NDD) (45% vs. 57%; p=0.43). Patient and donor characteristics were not statistically different between the two groups. GFR at three months for the high RI group was 57 ml/min/1.72m^2 vs. 45 ml/min/1.72m^2 for the lower RI group (p=0.02). Similarly, at one year, the GFRs were 58 and 48 ml/min/1.72m^2, respectively (p=0.03). Death censored GS and overall GS were not significantly different between these groups at a median followup of 6.75 years (90% vs. 96%).
Conclusions: Deceased donor renal transplant recipients with DGF and early postoperative RIs >0.8 had superior GFR vs. patients with normal RIs. We believe that the presence of DGF in recipients without severe ischemic reperfusion injury (normal RIs) may represent those individuals that have received kidneys with inferior intrinsic renal functional capacity. Further laboratory and clinical studies are required to confirm this.

MP-02.04
Role of synthetic mesh renorrhaphy and neocapsule reconstruction to salvage severely damaged renal allografts

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Introduction: Attempts to increase the donor pool have lead to the use of organs from unconventional donors. Injured renal allografts are usually discarded without attempt for transplantation due to concerns for hemorrhage, urinoma, and non-function. Thus, there is little information available about salvageability, repair techniques, complications, and outcomes. We present an easily replicable technique to salvage damaged renal allografts using polyglactin mesh in a post-transplantation setting.
Methods: In this technique,12 x 12 inch polyglactin woven mesh was used in vest-over-pants manner with keyhole hilar exit and slit for ureteral spar-

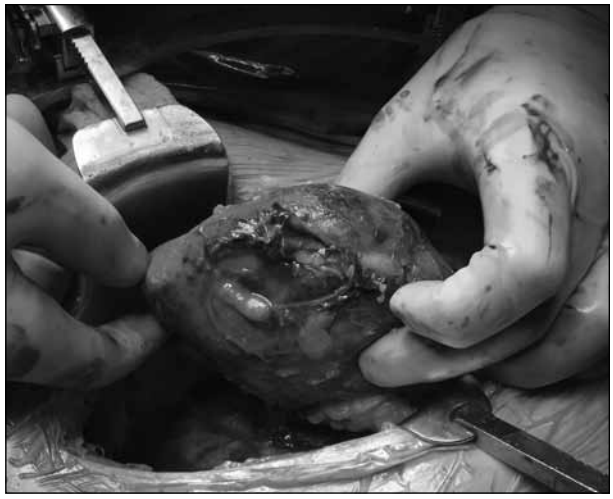

Fig. 1. MP-02.04. A denuded capsule that was successfully treated.

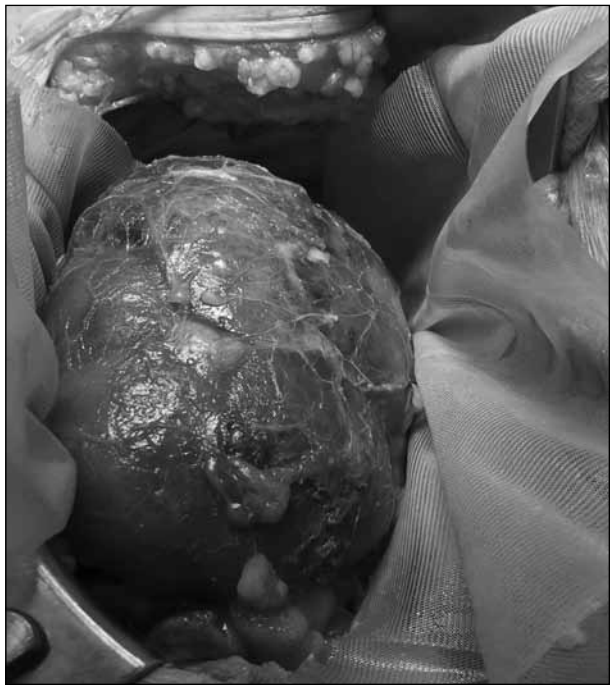

Fig. 2. MP-02.04. Process of salvaging damaged renal allografts.

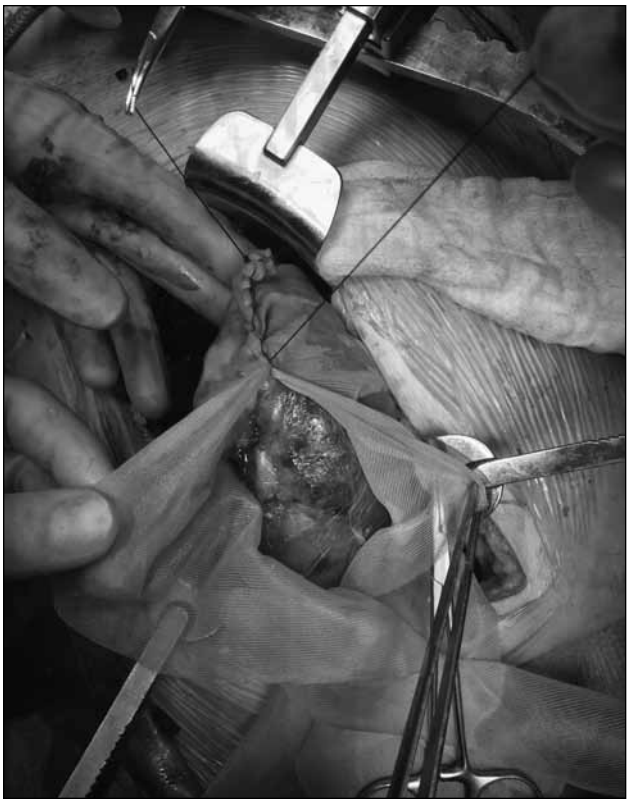

Fig. 3. MP-02.04. Process of salvaging damaged renal allografts.

MP-02.04. Table 1. Case scenario information

	Injury	Additional topical hemostatic agent	Complications
1	Extracorporeal shockwave lithotripsy for stone disease caused unidentified severe capsular damage	No	None
2	Grade 3 traumatic laceration and calyceal injury identified due to expanding hematoma post-perfusion	No	None
3	Thrombophilic patient with expanding subcapsular hematoma causing capsular denudation due to iatrogenic needle laceration 2 months post-living related kidney from mother	Yes	None
4	Anticoagulated thrombophilic patient with expanding subcapsular hematoma causing capsular denudation and retroperitoneal bleed, repaired 4th day postoperatively	Yes	None

ing. Fig. 1 depicts a denuded capsule that was successfully treated with this technique. Figs. 2 and 3 demonstrate the process of the technique. The two tails of the above fashioned mesh then were wrapped at the convex border of the allograft, closed with a running suture. All four scenarios in which this technique was used are described in Table 1. Topical hemostatic agents were used in the last two cases, in addition to mesh repair due to anticoagulation. All these allografts were successfully salvaged, with no immunosuppression adjustment. They were monitored for urinoma, infection, re-bleed, allograft hydronephrosis, and Page kidney.
Results: Using this simple technique, all allografts were saved from allograftectomy. No patient developed Page kidney, hydronephrosis, urinoma, or hemorrhage. One patient had an allograft biopsy through the neocapsule without any difficulty or complications. As of last followup, one patient lost the kidney secondary to chronic allograft nephropathy after seven years, one patient was lost to followup at one year with normal renal function at last lab draw, two patients have normal renal function at Years 1 and 6 post-transplantation.
Conclusions: This simple technique using readily available materials can salvage allografts that would have been potentially explanted or discarded.

MP-02.05

Concurrent bilateral native nephrectomy at the time of living donor renal transplantation in autosomal dominant polycystic kidney disease, a safe and feasible operative approach

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Introduction: Concurrent bilateral native nephrectomy (BNN) with renal transplantation (Tx) for autosomal dominant polycystic disease (ADPCKD) is a large surgical undertaking described as both feasible and controversial in the limited literature on the subject. Our objective is to compare operative characteristics between patients undergoing simultaneous BNN and Tx vs. those who underwent staged procedures.
Methods: We reviewed our single-centre experience with BNN with Tx for ADPCKD between 2010 and 2016. BNN was performed by a single surgeon while Tx was performed by multiple surgeons (four). Patients were grouped according to timing of surgery: BNN prior to Tx: BNN following Tx: or simultaneous BNN and Tx. Patient characteristics and allograft outcomes were recorded. BNN was completed laparoscopically with low midline hand-assist port placement (rarely via a retroperitoneal approach) and for those patients undergoing concurrent Tx, this was performed using the hand-assist port site.
Results: 40 patients with ADPCKD were identified who underwent both Tx and BNN. 23 patients had staged operations, with 11 undergoing BNN prior to Tx, and 12 with Tx prior to BNN with an average interval of 2.5 years between operations. 17 patients underwent concurrent BNN and Tx. Mean patient age was 54 years (43–75) with estimated glomerular filtration rate (GFR) of 59.7 (38–80) at mean followup of 30 months. Average hospital length of stay was 5.5 days (4–7) with an average blood loss of 238 cc. Average length of stay in patients undergoing staged intervention was longer at 9.5 days cumulatively ($p<0.05$). No patient in the simultaneous group lost graft function requiring dialysis and complications were limited to perioperative blood transfusion in two patients and femoral nerve neuropraxia in one. Mean operative time was 7.8 hours and not significantly different compared to staged operations.
Conclusions: Synchronous BNN with Tx is a feasible surgical approach for patients with ADPCKD with living kidney donors and can avoid need for subsequent nephrectomy, symptoms of ADPCKD, and surveillance for neoplasm. Operative complications were minimal and not significantly different from staged ORs, while length of stay was significantly shorter in the synchronous group.

MP-02.06

Conversion from twice daily to once daily tacrolimus improves adherence in kidney transplant recipients

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Introduction: The success of kidney transplant longevity is largely related to immunosuppressive efficacy, which is highly dependent on patient adherence. Drug dosing frequency is one means by which the prescriber can influence adherence. The objective of this study is to determine if conversion from twice daily to once daily tacrolimus improves medication adherence in kidney transplant recipients.

Methods: This is a retrospective, cohort study examining kidney transplant recipients at the University of Alberta transplanted between 2005 and 2014 who were prescribed twice daily tacrolimus and subsequently converted to once daily formulations. The primary outcome is the rate of adherence to tacrolimus. Adherence was assessed by review of pharmacy prescription fill data and calculation of the cumulative days lapsed between refills, expressed as the percentage medication missed days (PMD); a positive value indicated days lapsed between refills, while a negative value indicated refills picked up prior to the end of the previous prescription duration, indicating adequate supply of medication. Patients were subdivided into tertiles of PMD on twice daily dosing and compared to post-conversion PMD within tertiles. Statistical analysis included two-tailed paired t-test for comparison of adherence rates and chi-square analysis of the distribution of donor types, with an alpha of 0.05.

Results: A total of 203 patients met inclusion criteria for analysis. The average age was 46.5 (standard deviation [SD] 15.1) years (range 2–80). The average PMD while on twice daily dosing was -5.3% and while on daily dosing was -9.2% (p=0.13). When patients were subsequently divided into tertiles based on their PMD on twice daily tacrolimus, the first tertile showed worsening of adherence after conversion from twice daily to daily dosing (-30.2% to -10.6%; p<0.001), but clinically remained "adherent." The second tertile did not significantly change after conversion to (-5 to -10%; p=0.07). The third tertile showed significant improvement in adherence, both statistically and clinically, after conversion to daily dosing (+23% to -7%; p<0.001).

Conclusions: The conversion to once daily from twice daily tacrolimus has the potential to significantly improve adherence in a subset of the kidney transplant population. Those with the worst adherence (worst tertile of PMD) show the greatest improvement with a reduced frequency of medications, while those with good baseline adherence on twice daily dosing remain adherent after conversion to daily dosing.

Poster Session 3: Prostate Cancer
June 25, 2017; 1600–1730

IPD-03.01

Prostate-specific antigen testing for prostate cancer screening: A national survey of Canadian primary care physicians' opinions and practices in 2016

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Introduction: In 2014, the Canadian Task Force on Preventive Health Care (CTFPHC) recommended against routine prostate cancer screening with the prostate-specific antigen (PSA) blood test.[1] We surveyed Canadian primary care physicians (PCPs) to understand their opinions and attitudes towards prostate cancer screening in 2016.

Methods: We designed a survey addressing key issues around PSA screening. Twenty PCPs piloted the survey to assess its accessibility. We distributed a flyer to 19 633 PCPs as an insert in a large mailed package inviting them to attend a national meeting, and later promoted the survey at the meeting. Multinomial logistic regression models examined the association between physician characteristics and agreement with key guideline statements and the overall benefit of PSA screening.

Results: A total of 1254 PCPs responded (rate of 6.4%). 45.4% use government guidelines, such as the CTFPHC, to inform their screening practices. 54.7% of physicians aware of the CTFPHC recommendations report screening less often as a result. Overall, 55.6% of PCPs feel that the risks of PSA screening outweigh the benefits, and 89.4% who believe in screening employ a shared decision-making approach in their practice. On multivariable analysis, physicians who did not read the guidelines, did not have an academic appointment, or were in practice for over 20 years were significantly more likely to disagree that men 55–69 years old should not be screened for prostate cancer with PSA (Table 1).

Conclusions: Our national survey found that the prostate cancer screening practices of Canadian PCPs varies widely across physician demographic groups, with almost equal numbers for or against. This has significant ethical, medical, and legal implications. Future efforts should provide physicians with objective guidance around PSA screening, incorporating input from all stakeholders, including PCPs, urologists, and patients.

Reference:

1. Canadian Task Force on Preventive Health Care, Bell N, Connor Gorber S, et al. Recommendations on screening for prostate cancer with the prostate-specific antigen test. *CMAJ* 2014;186:1225-34. https://doi.org/10.1503/cmaj.140703

IPD-03.02

Analysis of real-world use of radium-223 in Ontario

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Introduction: Radium-223 (Ra223) improves survival and delays symptomatic skeletal events in patients with metastatic castration-resistant prostate cancer (mCRPC) to bone. In the ALSYMPCA registration trial, 63% of patients received the maximum of six cycles of Ra223. Because patients treated outside of clinical trials typically are older and present with more comorbidities, we decided to study the real-world use of Ra223 in Ontario.

Methods: In this retrospective chart review, we studied mCRPC patients receiving ≥1 dose of provincially funded Ra223 at Odette Cancer Centre from January 2015 to April 2016. Primary endpoints were the median number of Ra223 cycles and reasons for treatment discontinuations at <6 cycles. Secondary endpoints included baseline disease characteristics, the rate of PSA30 responses and of alkaline phosphatase (ALP) normalization, and adverse events.

Results: 34 patients were identified with a median age of 78.5 years, and the following baseline biochemical values (median): prostate-specific antigen (PSA) 52 µg/L, ALP 107 U/L, hemoglobin 124 g/L. 21 patients (62%) were docetaxel-naïve. Prior to Ra223, 47% of patients had received one line, 32.5% two lines, and 20.5% three lines of mCRPC therapy. Of 28 patients who finished Ra223, 13 (46.4%) completed six cycles, for a median of five (1–6) cycles overall. Main reasons for early Ra223 discontinuation (15 patients) were symptomatic disease progression (40%) and patient request (20%). In patients receiving ≥3 cycles of Ra223, PSA30 was 5%, and ALP normalization was seen in 4/9 (44.5%) patients with baseline ALP elevation. There were no unexpected adverse events.

Conclusions: In an older, real-world patient population with similar, if not better baseline disease characteristics than in ALSYMPCA, Ra223 can be administered efficaciously and safely, but the rate of patients completing six cycles of Ra223 is lower. We are in the process of collecting data from three additional centres (Princess Margaret Cancer Centre, Lakeridge Health, Juravinski Hospital) to analyze factors predicting early treatment termination.

IPD-03.03

Fatigue in men with metastatic castration-resistant prostate cancer treated with enzalutamide: Data from randomized clinical trials

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Study Groups: Funded by Astellas Pharma, Inc and Medivation, Inc (acquired by Pfizer, Inc. in September 2016).

Introduction: Fatigue is common in men with advanced prostate cancer and may be related to disease progression, ongoing systemic therapy, comorbidities, concomitant medications, or a combination of these factors. Fatigue adverse events (AEs) across four double-blind, randomized, placebo- or

IPD-03.01. Table 1. Results of multinomial logistic regression

	Men less than 55 years old should not be screened for prostate cancer with the PSA test:						Men 55–69 years old should not be screened for prostate cancer with the PSA test:						Men greater than 70 years old should not be screened for prostate cancer with the PSA test:					
	Disagree			Agree			Disagree			Agree			Disagree			Agree		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Read guidelines (yes vs. no)	0.94	0.54	1.64	1.21	0.74	1.96	**0.59**	**0.37**	**0.95**	1.03	0.63	1.68	0.66	0.35	1.23	0.87	0.51	1.48
Academic appointment (yes vs. no)	1.20	0.75	1.93	**2.07**	**1.39**	**3.09**	**0.67**	**0.46**	**0.98**	1.12	0.78	1.60	0.97	0.58	1.61	**1.95**	**1.30**	**2.92**
Catchment area																		
Small	Ref			Ref			Ref			Ref			Ref			Ref		
Medium	1.31	0.65	2.64	1.06	0.60	1.87	1.22	0.71	2.09	1.14	0.68	1.90	0.76	0.36	1.61	1.05	0.58	1.91
Large	1.57	0.89	2.77	0.98	0.62	1.55	1.18	0.76	1.83	1.06	0.70	1.61	0.80	0.44	1.44	0.87	0.54	1.40
Gender (female vs. male)	0.63	0.39	1.03	0.81	0.54	1.22	0.74	0.50	1.08	**0.67**	**0.46**	**0.96**	0.89	0.53	1.50	1.09	0.72	1.64
Years in practice																		
<5	Ref			Ref			Ref			Ref			Ref			Ref		
5–10	1.53	0.76	3.08	0.73	0.42	1.25	1.53	0.91	2.57	0.91	0.56	1.47	1.70	0.81	3.56	0.99	0.57	1.74
10–20	1.80	0.90	3.61	0.60	0.34	1.05	1.17	0.70	1.96	**0.58**	**0.36**	**0.95**	1.96	0.94	4.09	0.87	0.49	1.54
>20	**2.43**	**1.29**	**4.60**	**0.56**	**0.33**	**0.94**	**2.73**	**1.63**	**4.57**	0.99	0.60	1.63	**2.41**	**1.24**	**4.68**	0.83	0.50	1.40
Province																		
Maritime + territories	Ref			Ref			Ref			Ref			Ref			Ref		
BC	1.17	0.47	2.95	0.86	0.39	1.91	1.01	0.49	2.05	1.02	0.50	2.08	0.77	0.26	2.29	0.41	0.16	1.05
Prairies	0.68	0.27	1.72	0.85	0.39	1.85	1.05	0.52	2.13	1.00	0.49	2.03	0.59	0.20	1.78	0.53	0.21	1.35
Central	0.63	0.26	1.56	1.03	0.48	2.20	0.67	0.34	1.34	1.26	0.64	2.48	0.46	0.15	1.37	0.71	0.28	1.76

CI: confidence interval; OR: odds ratio; PSA: prostate-specific antigen.

bicalutamide-controlled trials of enzalutamide (ENZ) for men with metastatic castration-resistant prostate cancer (mCRPC) are summarized to assess incidence, timing, and effect of age on fatigue.

Methods: Safety data from ENZ trials (AFFIRM, PREVAIL, TERRAIN, and STRIVE) for men with mCRPC were evaluated for fatigue AEs. As per Common Terminology Criteria for Adverse Events (CTCAE), v4.0, fatigue is defined as a state of generalized weakness, with a pronounced inability to summon sufficient energy to accomplish daily activities. Analyses included unadjusted and per 100 patient-years fatigue AE incidences assessed by grade, time, and age.

Results: With 2051 men in the ENZ arms and 1630 in the control arms, total treatment exposure patient-years were longer for ENZ (range 219–1294) vs. control (range 143–560). The unadjusted percentages of men reporting fatigue for all grades were slightly higher in ENZ (range 28–38%) vs. control (range 20–29%). Grade 3 fatigue AEs were reported by <10% of men and in similar proportions in both arms (1–6% for ENZ vs. 1–7% for control). The exposure-adjusted incidence rates of fatigue AEs were similar or lower in ENZ vs. control (24–47 and 28–71 events per 100 patient-years, respectively). In the first six months, the fatigue AE incidence in ENZ was slightly higher vs. control (26–30% and 17–28%, respectively). Time to fatigue onset in the ENZ and control arms was similar. In all trials, younger men (<75 years) experienced less fatigue vs. older men (20–35% vs. 21–42%, respectively), regardless of treatment.

Conclusions: Early-onset fatigue occurred slightly more frequently in ENZ-treated patients. Irrespective of treatment, fatigue was more common in men ≥75 years and was Grade 3 in a small percentage of men.

IPD-03.04

Transrectal ultrasound-guided biopsy for prostate cancer detection: Systematic, systematic + magnetic resonance imaging (MRI)-targeted, or MRI-targeted only — what is best?

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Introduction: Magnetic resonance imaging (MRI) is being more widely used in the detection of prostate cancer (PCa), particularly after an initial negative biopsy. In this study, we compared 12-core systematic biopsy (SYS), MRI-targeted biopsy (TAR), and the association of systematic and MRI-targeted (SYS + TAR) prostate biopsy in patients with previous biopsy and those who were biopsy-naive to evaluate the differences in terms of cancer detection and clinically significant cancer detection between the three modalities.

Methods: Overall, 203 consecutive patients with suspicion of PCa were analyzed; 48.2% were biopsy-naive and 51.7% had at least one previous negative prostate biopsy. The median age was 66 years, median prostate-specific antigen (PSA) level 7.9 ng/mL, and median prostate volume 46 mL.

38.9% had SYS, 19.2% TAR only, and 41.8% had SYS + TAR biopsy.
Results: Overall, the PCa detection was 63%. The SYS + TAR biopsy detected significantly more cancer than SYS and TAR only biopsies (72.9% vs. 56.9% and 53.8%, respectively; p=0.03). Detection rate of clinically significant cancer (csCDR) was overall 50.7%; 65.8% in the SYS + TAR biopsy vs. 39.2% in the SYS and 48.7% in the TAR group (p=0.002). In the biopsy-naïve group, PCa CDR and csPCa CDR were significantly higher in the SYS + TAR group than in the SYS and TAR groups (p=0.01). In the repeat biopsy group, CDR and csCDR were equivalent in the TAR and SYS + TAR groups and higher than in the SYS group (p=0.001).
Conclusions: MRI-targeted biopsy when added to systematic biopsy was associated with a higher detection rate of csPCa in biopsy-naive patients when compared to MRI-targeted or 12-core systematic biopsy alone. In patients after previous negative biopsy, detection rates of csPCa were equivalent between SYS+ TAR and MRI-targeted-only biopsy, but higher than with 12-core systematic biopsy.

IPD-03.05

Potential role of a novel urinary biomarker-based risk score to select patients for multiparametric magnetic resonance imaging for prostate cancer detection

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Introduction: Prostate cancer (PCa) diagnostics would benefit from more accurate, non-invasive techniques for the detection of clinically significant disease. Multiparametric magentic resonance imaging (mpMRI) is a valuable addition to the PCa diagnostic pathway. A novel biomarker-based risk score (SelectMDx) assessing urinary HOXC6 and DLXI mRNA expression levels combined with traditional clinical risk factors, was developed to predict high-grade PCa (Gleason score ≥7) upon prostate biopsy and to reduce unnecessary biopsies. The aim was to investigate the correlation between the risk score and mpMRI outcomes.
Methods: The patients in this retrospective observational cohort were previously included in the validation study of the SelectMDx risk score, in which urine was collected after digital rectal exam (DRE) from men undergoing prostate biopsies based on an elevated serum prostate-specific antigen (PSA) (≥3.0 ng/ml) and/or suspicious DRE. A subset of patients underwent a mpMRI after prostate biopsies were performed (n=174). The indications for MRI were based on persistent clinical suspicion of PCa after negative prostate biopsies or staging after PCa was found upon biopsy.
Results: 102 of 174 patients (59%) had PCa detected upon biopsy, of which 54 (53%) had high-grade disease and a significantly higher SelectMDx risk score (p<0.001). The median SelectMDx risk score was significantly higher in patients who had a suspicious lesion on MRI (p<0.001). For 81 mpMRIs, the Prostate Imaging Reporting and Data System (PI-RADS) classification was reported and there was a positivie correlation observed between the risk score and the PI-RADS classification (Fig. 1). A Kruskal-Wallis test indicated a statistically significant difference in SelectMDx risk scores between the different PI-RADS groups (p<0.001).
Conclusions: The novel urinary biomarker-based risk score showed promising results regarding the correlation between the SelectMDx risk score and the MRI outcomes. This risk score could potentially guide clinicians in selecting patients at risk for significant PCa for mpMRI.

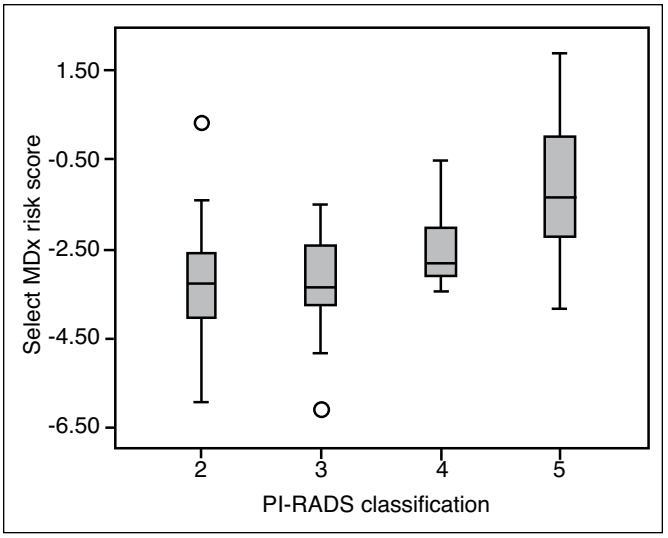

Fig. 1. IPD-03.05. Correlation between risk score and the Prostate Imaging Reporting and Data System (PI-RADS) classification.

MP-03.01

Prognostic value of intraprostatic 18 F-fluorodeoxyglucose uptake to discriminate preoperatively high-risk from very-high-risk prostate cancers by positron-emission tomography molecular imaging

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Introduction: The accuracy of 18 F-fluorodeoxyglucose positron-emission tomography/computed tomography (FDG-PET/CT) to stage prostate cancer (PCa) is poor. However, it was shown that high-grade and more aggressive metastatic PCa exhibit higher glycolytic activity. The objective of our study was to evaluate the ability of intraprostatic FDG uptake (IPFU) to predict more aggressive disease and biochemical recurrence-free survival (BFS) in a cohort of patients with high-risk PCa.
Methods: Between 2011 and 2014, FDG-PET/CT was used in the diagnostic workup of 148 patients treated with surgery for localized PCa Gleason sum ≥8 at biopsy. Intraprostatic FDG uptake were systematically recorded and correlated with postoperative clinicopathological characteristics. BFS was defined as a rising prostate-specific antigen (PSA) >0.2 ng/ml and was analyzed using Kaplan-Meier estimates.
Results: At biopsy, 99, 47, and two patients had Gleason sum of 8, 9, and 10 PCa, respectively. FDG-PET/CT could detect FDG uptake foci in 61% of patients in whom average SUVmax was 5.43 ± 3.85. Median followup was 2.2 years. An intraprostatic FDG uptake SUVmax ≥4.5 was statistically significantly associated with a higher pathological Gleason sum (≥8) (odds ratio [OR] 3.2), extracapsular extension (OR 3.1), higher volume of cancer (40% vs. 26%; p< 0.001), and pathological lymph nodes metastasis (OR 2.3; all p<0.05). More interestingly, intraprostatic SUVmax ≥4.5 was an independent predictive factor of decreased BFS at one year following surgery (hazard ratio [HR] 1.95; confidence interval [CI] 1.01–3.76; p<0.05). Patients with an intraprostatic SUVmax ≥4.5 and <4.5 had a calculated median BFS of 11.3 and 39.8 months, respectively (p<0.05).
Conclusions: Our study shows that preoperative IPFU is a predictor of BFS after radical prostatectomy (RP) in patients with Gleason ≥8 PCa at biopsy. These results support the use of preoperative FDG-PET/CT as a tool to distinguish high-risk from very-high-risk PCa patients in order to personalize adjuvant therapies after RP.

MP-03.02

Can a supervised algorithmic assessment of men for prostate cancer improve the quality of care? A retrospective evaluation of a prostate assessment pathway in Saskatchewan

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Study Groups: Nicole Baba and Karen Moore, Nurse Navigators, Urology Centre of Health, Saskatoon Health Region, Osama Butaineh, Statistician for Department of Surgery, University of Saskatchewan.

Introduction: The Saskatoon Prostate Assessment Pathway (SPAP) was developed in 2013 in part to decrease the wait times between physician referral and biopsy for patients with suspected prostate cancer. Using a carefully designed algorithm, physicians can directly refer patients for biopsy through the SPAP without seeing a urologist. All other patients are referred to the Saskatoon Urology Associates (SUA). The present study evaluates the performance of the algorithm.

Methods: 971 patients seen at the SUA and 302 patients seen through the SPAP were identified. Information on age, biopsy status and outcome, risk stratification, and time between referral and biopsy was collected. Biopsy wait time data was analyzed using gamma distribution. Association between referral method and biopsy rate, and between referral method and risk stratification, was analyzed using Z-test.

Results: The expected wait time from referral to biopsy for patients seen through SUA was 2.63 times longer than those seen through SPAP (34 vs. 91 days) (Fig. 1). The biopsy rate of patients seen in the SPAP was significantly higher than those by SUA (88% vs. 69%, 95% confidence interval [CI] 0.14–0.26; p<0.00001) (Fig. 2). There was no significant difference in positive biopsy rates for patients seen through the SPAP vs. SUA (81% vs. 74%, 95% CI -0.011,0.14; p=0.095) (Fig. 3), for detection of low-risk cancer, (12% vs.10%, 95% CI -0.034,0.080; p=0.44), or for clinically relevant cancer, i.e. intermediate- and high-risk cancer for SPAP vs. SUA (56.54% vs. 56.68%, 95% CI -0.091,0.089; p=0.49) (Fig. 4).

Conclusions: The algorithm used in the SPAP is effective in decreasing wait time to prostate biopsy and has the same cancer/pre-cancer detection rate, but at the cost of a higher biopsy rate. Both referral mechanisms result in few low-risk cancer detection biopsies, finding primarily cases of high- or intermediate-risk cancer.

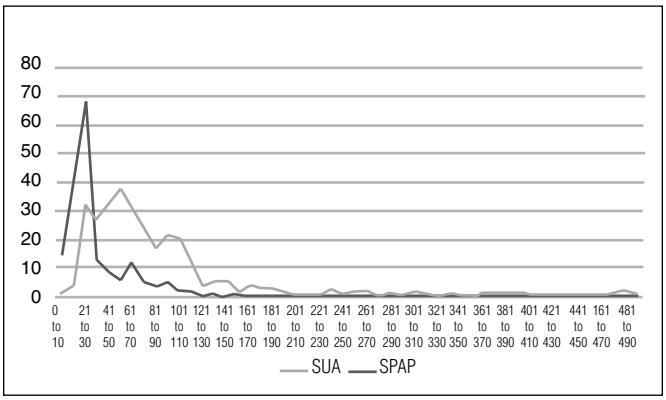

Fig. 1. MP-03.02. Wait time between referral to biopsy (days). SPAP: Saskatoon Prostate Assessment Pathway; SUA: Saskatoon Urology Associates.

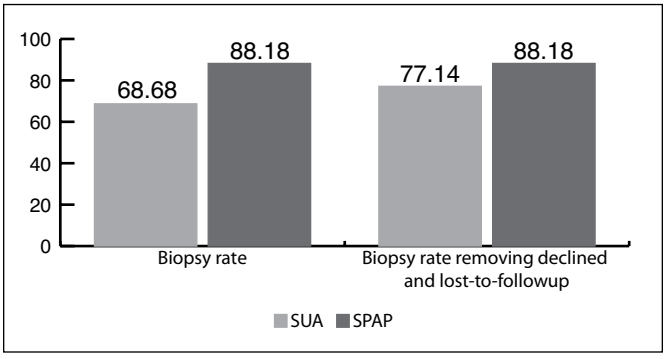

Fig. 2. MP-03.02. Biopsy rate (%). SPAP: Saskatoon Prostate Assessment Pathway; SUA: Saskatoon Urology Associates.

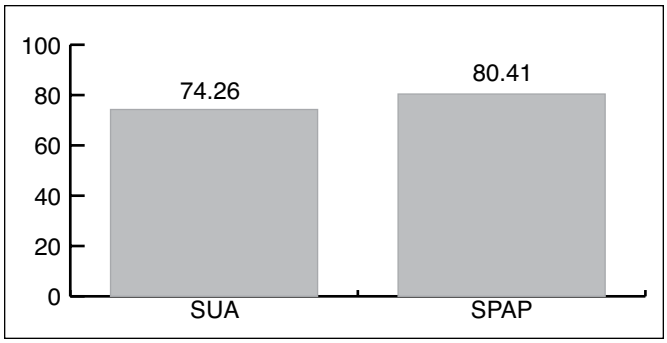

Fig. 3. MP-03.02. Prostate biopsy (cancer + ASAP). SPAP: Saskatoon Prostate Assessment Pathway; SUA: Saskatoon Urology Associates.

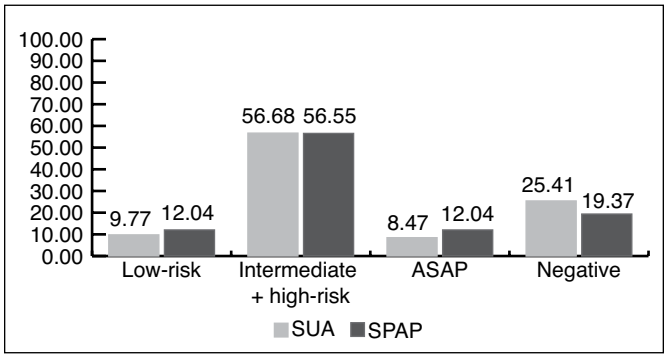

Fig. 4. MP-03.02. Risk stratification (%). SPAP: Saskatoon Prostate Assessment Pathway; SUA: Saskatoon Urology Associates.

MP-03.03

Statin use and time to prostate cancer progression in men undergoing active surveillance

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Introduction: Active surveillance (AS) is increasingly preferred as the initial treatment for low-risk prostate cancer (PCa). Although preclinical data support a protective effect of statins in PCa, clinical studies remain conflicting. To date, no study has yet assessed the impact of statin use in AS.

Methods: Data were obtained from our AS cohort (1995–2016) at our institution. All men had low-risk PCa: Gleason score <7, <4 positive cores, <50% core involvement, and prostate-specific antigen (PSA) <10 ng/dL. Reclassification at confirmatory biopsy (first post-diagnostic biopsy) and progression beyond confirmatory biopsy were evaluated independently. Multivariable Cox proportional hazard models assessed statin exposure at diagnosis and time to pathological (failing to meet low-risk criteria at rebiopsy) and therapeutic progression (first of pathological progression or initiation of medical therapy).

MP-03.03. Table 1. Summary of results

Outcome	Univariate	Multivariate
Reclassification at confirmatory biopsy*	**OR (95% CI)**	**OR (95% CI)**
Progression	1.21 (0.84–1.76)	1.24 (0.77–1.99)
Pathological progression beyond confirmatory biopsy**	**HR (95% CI)**	**HR (95% CI)**
Model 1	0.84 (0.56–1.25)	0.79 (0.51–1.23)
Model 2	-	0.66 (0.38–1.15)
Model 3	-	1.17 (0.70–1.97)
Therapeutic progression beyond confirmatory biopsy**	**HR (95% CI)**	**HR (95% CI)**
Model 1	0.82 (0.58–1.17)	0.81 (0.55–1.19)
Model 2	-	0.73 (0.45–1.18)
Model 3	-	0.96 (0.60–1.54)

*Reclassification at confirmatory biopsy was considered a binary analysis; **progression beyond confirmatory biopsy was considered a time-to-event analysis. Model 1 included 603 men (137 statin users), and adjusted for: age, previous negative biopsies, positive findings on digital rectal exam, log-prostate-specific antigen, log-transrectal ultrasonography-measured prostate volume, number of positive cores, log-max percent core involvement, and non-steroidal anti-inflammatory drug and 5-alpha-reductase inhibitor use at diagnosis. Model 2 included 410 men (92 statin users), and adjusted for: Model 1, family history, ethnicity, and body mass index. Model 3 treated statin exposure as a time-sensitive covariate and included 467 men (137 statin users) and adjusted for Model 1. CI: confidence interval; HR: hazard ratio; OR: odds ratio.

Results: 797 men satisfied low-risk criteria. Reclassification at the confirmatory biopsy occurred in 194 (24%) men, 51 (26%) of whom were statin users; no significant association with statins was observed. Among the remaining 603 men (median age 63 years; median followup: 60 months), 137 (23%) were statin users, and 149 (24%) progressed pathologically, while 200 (33%) progressed therapeutically. While a protective trend was observed, statin exposure was not significantly associated with pathological (adjusted hazard ratio [aHR] 0.79, 95% confidence interva l[CI] 0.51–1.23) or therapeutic (aHR 0.81, 95%CI 0.55–1.19) progression beyond the confirmatory biopsy. Considering statin exposure as a time-dependent covariate lessened the association, while incorporating further covariates improved the association, without significance (Table 1).
Conclusions: The current study does not support a secondary chemopreventative role for statins in men undergoing AS for localized, low-risk PCa. Future studies should explore this association in larger or pooled AS series.

MP-03.04

Impact of adipose tissue distribution on cancer aggressiveness and positive margins after radical prostatectomy

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Introduction: Visceral obesity is associated with an increase in perioperative complications and a poorer prognosis in colon cancer. We investigated whether visceral adiposity is associated with more aggressive disease at prostatectomy in patients with localized prostate cancer.
Methods: 474 patients treated with postoperative adjuvant or salvage radiotherapy were included in this study. Primary endpoints were positive surgical margins (pSM), extracapsular extension (ECE), and a pathological upgrade defined as the development of a primary Gleason of 3 into at least a primary Gleason 4 score. Visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) were manually contoured at the level of intervertebral space L4 and L5. Mean adipose tissue density was measured in Hounsfield units (HU). Univariate logistic regression was performed. In a secondary analysis, for each outcome, multivariate logistic regression was used with all predictors and adjusted for the confounders with univariate p value <0.20. Wald tests were used for assessing evidence of association with the outcome. 95% confidence intervals (CI) were calculated using the profile log-likelihood function.
Results: A total of 42% of the cohort had pSM. In univariate analysis, VAT volume (p=0.006), adipose tissue ratio (VAT/SAT, p=0.003), density of the SAT (p=0.04), as well as age (p<0.001) were associated with pSM. On multivariate analysis, none of the adipose tissue-associated factors was predictive of margin status. A total of 46% of the cohort presented ECE. In the univariate analysis, SAT density was associated with a trend towards a higher rate of ECE (p=0.051), but visceral fat volume (odds ratio [OR] 0.99; 95% CI 0.974–0.997; p=0.01), as well as the adipose tissue ratio (OR 0.55; 95% CI 0.32–0.91; p=0.03) were both protective factors. On multivariate analysis, only an increase in SAT density was associated with a trend towards an increased rate of ECE (OR 1.10; 95% CI 0.995–1.223; p=0.07). The mean delay between biopsy and surgery was 3.9 months (standard deviation [SD] 2.2; range 5–13). The only predictive factor of a Gleason upgrade (17% of cases), was a longer delay between the biopsy and surgery on univarate and multivariate analysis (OR 1.39; 95% CI 1.05–1.86; p=0.02)
Conclusions: SAT volume and increased SAT density were generally associated with more aggressive prostate cancers, whereas VAT was a protective factor. These findings emphasize a possible mechanism for an association between obesity and prostate cancer aggressiveness. This knowledge could help in developing new preventative and therapeutic measures.

MP-03.05

16p13.3 genomic gain: An independent predictor of poor clinical outcome in prostate cancer patients treated with radical prostatectomy

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Introduction: Prostate cancer (PCa) is a heterogeneous disease and distinguishing aggressive tumours from the indolent ones is a major challenge in its clinical management. PCa metastases are enriched in high-frequency genomic alterations, including the recently characterized gain at the 16p13.3 region.[1] With its clinical relevance unknown, we hypothesized that the 16p13.3 gain might predict the individual clinical outcome if detected early in primary tumours.
Methods: Dual-colour fluorescence in situ hybridization (FISH) was used to detect 16p13.3 gain on a tissue microarray (TMA) representing 304 primary radical prostatectomy (RP) cases with clinical followup data. The results were validated in an external dataset.[2]
Results: The 16p13.3 gain was detected in 42% (113/267) of the specimens scorable by FISH and was significantly associated with clinicopathological features of aggressive PCa, including high preoperative prostate-specific antigen (PSA; p=0.03), high Gleason score (GS; p<0.0001), and advanced pathological tumour stage (pT-stage; p<0.0001). Importantly, the 16p13.3 gain predicted biochemical recurrence (BCR) (log-rank p=0.0005; hazard ratio [HR] 2.30), independent of standard prognostic indicators (preoperative PSA, GS, and pT-stage). The gain status further stratified subset of patients with low-intermediate risk of disease progression (PSA <10 or GS ≤7; log-rank p=0.005 and p=0.02, respectively). Moreover, combining the 16p13 gain status with standard prognostic markers improved BCR risk stratification. The 16p13.3 gain status was also associated with an increased risk of developing distant metastases (log-rank p=0.02), further substantiating its possible role in PCa progression.

Conclusions: This study, for the first time, demonstrates the prognostic significance of the 16p13.3 genomic gain in primary PCa patients and supports its potential utility as a marker of PCa progression. Identification and characterization of such novel biomarkers might aid in appropriate patient risk stratification and allow for efficient clinical management of PCa.

References:
1. Choucair KA, Guerard KP, Ejdelman J, et al. The 16p13.3 (PDPK1) genomic gain in prostate cancer: A potential role in disease progression. *Transl Oncol* 2012;5:453-60. https://doi.org/10.1593/tlo.12286
2. Taylor BS, Schultz N, Hieronymus H, et al. Integrative genomic profiling of human prostate cancer. *Cancer Cell* 2010;18:11-22. https://doi.org/10.1016/j.ccr.2010.05.026

MP-03.06

Prostate cancer screening among family physicians in Ontario, Canada: An update on attitudes and current practice

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Introduction: This study serves as an update of prostate cancer screening practices among family physicians in Ontario, Canada. Since this population was first surveyed in 2010,[1] the Canadian Task Force on Preventive Health Care (CTFPHC) and the U.S. Preventive Services Task Force (USPSTF) released recommendations against prostate cancer screening. The objective of this study was to determine the effect of recent task force recommendations on attitudes and use of the prostate-specific antigen (PSA) test among family physicians in Ontario.

Methods: An online survey was distributed via email to all members of the Ontario Medical Association's Section on general and family practice.

Results: A total of 1873 family physicians participated (response rate 16%). Most (53%) had been in practice for >20 years. Overall, 79% offer prostate cancer screening to their patients, down from 92% in 2010. Physicians new to independent practice (two years or less) were the least likely to offer screening at 68%. The most common form of screening was a combination of digital rectal exam (DRE) and PSA (59%), followed by PSA alone (14%) and DRE alone (12%). Nearly half of those surveyed (46%) screen fewer patients since the release of the CTFPHC and USPSTF receommendations. The CTFPHC had the greatest influence on screening practices, followed by the USPSTF. Family physicians in Ontario remain divided with respect to PSA utility (Fig. 1).

Conclusions: This is the largest survey of family physicians in Ontario, Canada with respect to prostate cancer screening practices. Data suggests a decline in screening practices since 2010, particularly among new graduates. The CTFPHC and USPSTF recommendations had the greatest impact on clinical practice. Those surveyed were divided with respect to PSA utility. Feedback from participants highlights the need for knowledge translation tools to assist family physicians in selecting men who may benefit from prostate cancer screening.

Reference:
1. Allard CB, Dason S, Lusis J, et al. Prostate cancer screening: Attitudes and practices of family physicians in Ontario. *Can Urol Assoc J* 2012;6:188-93. https://doi.org/10.5489/cuaj.11290

MP-03.07

Early cardivascular morbidity in a pilot prospective randomized trial comparing luteinizing hormone-releasing hormone agonist and antagonist among patients with advanced prostate cancer

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Introduction: Androgen-deprivation terapy (ADT) may increase the risk of cardiovascular (CV) events in prostate cancer (PCa) patients. Recent data suggests that luteinizing hormone-releasing hormone (LHRH) antagonists may be associated with lower risk of CV events compared to LHRH agonists. Our laboratory data suggest a role for follicle-stimulating hormone (FSH) in mediating ADT-induced atherosclerosis.

Methods: We conducted a bicenteral, randomized, open-label study on the use of degarelix compared to LHRH agonists among PCa patients with pre-existing CV disease scheduled to start ADT for at least a year. CV event was considered one of the following: myocardial infarction (MI), ischemic or hemorrhagic cerebrovascular event, arterial embolic and thrombotic events, emergency room visit or hospitalization due to ischemic heart disease (IHD), coronary artery or peripheral vascular disease event (vascular surgery/intervention). These events were prospectively collected. Serum levels for hormonal profile were taken at baseline and every three months.

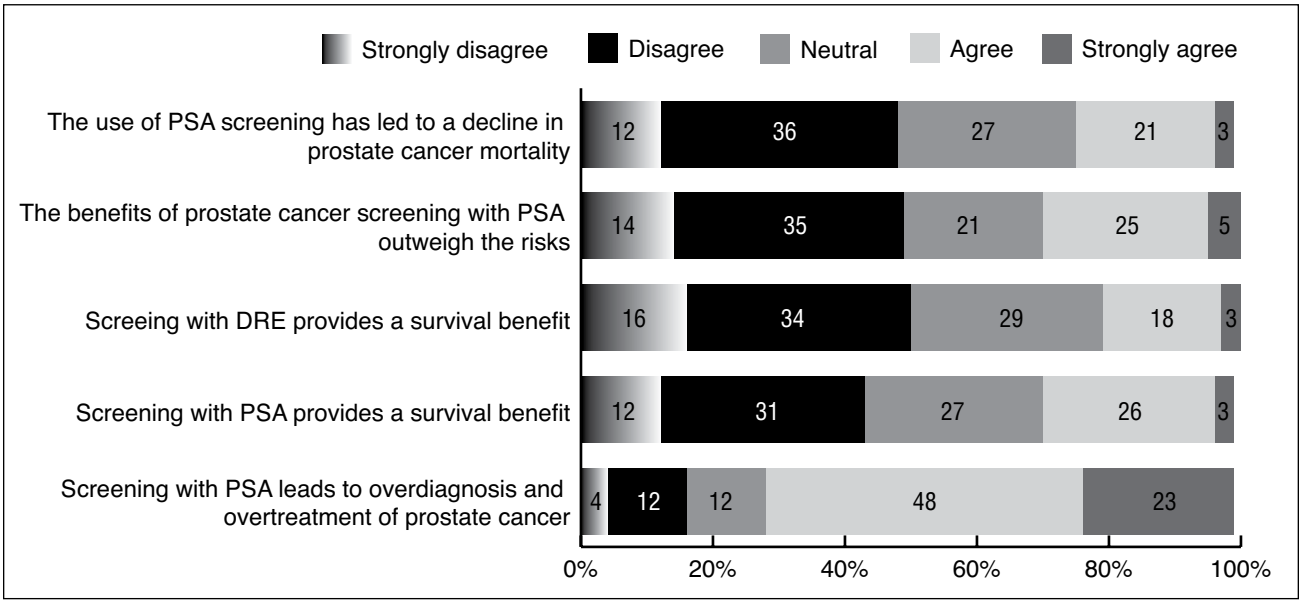

Fig. 1. MP-03.06. Prostate-specific antigen (PSA) utility as per survey responses. DRE: digital rectal exam.

Results: 46 patients were enrolled (23 randomized to each arm), with a median followup of 6.3 months. No difference in age, stage of PCa and baseline CV existed between the two arms. All patients achieved castrate testosterone levels. During followup, six patients developed a new CV event. Four of the six patients were hospitalized due to IHD, one patient had MI, and one a new ischemic cerebrovascular event. All six patients were randomized to the LHRH agonist arm (26%). None of the patients randomized to the degarelix arm experienced any new CV event during followup. FSH decreased from pre-ADT levels by a median of 93% among the degarelix arm compared to 27% reduction in the LHRH agonist arm (p=0.00011). Within the agonist arm, patients with a lower than 30% FSH decrease had a 50% probability of a CV event, compared to only 12.5% of patients with a higher effect on FSH levels.
Conclusions: Our pilot study suggests that CV events may develop early in patients receiving an LHRH agonist compared to an antagonist. These events may be linked to reduce suppression of FSH.

MP-03.08

Cancer control outcomes in active surveillance candidates who undergo immediate radical prostatectomy for low-risk prostate cancer

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Introduction: Active surveillance (AS) is a standard treatment option in men with low-risk, clinically localized prostate cancer (CLPC); however, cancer control outcomes are still incompletely defined. We sought to define predictors of pathological upgrading, upstaging, and biochemical recurrence (BCR) in AS candidates who chose to undergo immediate radical prostatectomy (RP).
Methods: A retrospective analysis of prospectively collected data from the University of Alberta Radical Prostatectomy Database was performed between 2007 and 2012. Subjects analyzed were candidates for AS (preoperative prostate-specific antigen [PSA] <10 ng/ml + preoperative composite Gleason score ≤6 + clinical stage T1c–T2a), but who chose to undergo immediate RP. All surgical specimens underwent pathological review by general anatomic pathologists. Cancer control outcomes included pathological upgrading (composite Gleason score ≥7 on the RP specimen), pathological upstaging (≥pT3a on the RP specimen) and BCR (PSA ≥0.2 ng/mL plus subsequent confirmatory value or initiation of salvage therapy). Multivariable regression analysis was used to determine predictors of cancer control outcomes. Statistical tests were two-sided (p≤0.05).
Results: 804 subjects were analyzed with a mean age of 60 years and mean body mass index of 29 kg/m^2. Pathological upgrading and upstaging occurred in 396 (49%) and 96 (12%) patients, respectively. With a median followup of 48 months, 49 (6%) patients experienced BCR. According to multivariable analysis, preoperative PSA (odds ratio [OR] 1.08; 95% confidence interval [CI] 1.02–1.16; p=0.02), number of positive biopsy cores (OR 1.14; 95% CI 1.08–1.20; p<0.01), and percentage of core involvement (OR 1.05; 95% CI 1.02–1.08; p<0.03) were independently associated with pathological upgrading, while age (OR 1.04; 95% CI 1.00–1.08; p=0.04), preoperative PSA (OR 1.18; 95% CI 1.09–1.28; p<0.01), number of positive biopsy cores (OR 1.19; 95% CI 1.12–1.27; p<0.01), and percentage of core involvement (OR 1.04; 95% CI 1.01–1.07; p=0.008) were independently associated with pathological upstaging. Only preoperative PSA (OR 1.20; 95% CI 1.10–1.31; p<0.01) was independently associated with BCR.
Conclusions: A high proportion of men diagnosed with low-risk, clinically localized prostate cancer remain undergraded and/or understaged. Increasing age, PSA, number of positive biopsy cores, and percentage of core involvement were independently associated with adverse cancer control outcomes. These results may help physicians when counselling patients diagnosed with low-risk prostate cancer.

MP-03.09

Automatic detection of prostate cancer in whole-mount histopathology slides

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Introduction: Digital pathology, together with image processing and machine learning, has been shown to increase accuracy, consistency, and throughput of diagnosis and prognosis of diseases by automatic histopathological analysis. We present a machine-learning approach to detect prostate cancer (PCa) based on morphological analysis of whole-mount (WM) histopathology slides. Our novel technique allows labeling individual glands as benign or malignant using glandular-, nuclear-, and image-based features. The main advantage of this approach is that it can detect individual malignant gland units, irrespective of neighbouring histology or the spatial extent of the cancer.
Methods: Our data comprises 230 WM slides acquired from 58 prostatectomy patients. The slides were digitally scanned at 20x magnification, and annotated by up to four pathologists for a consensus on three benign and nine cancerous histological patterns associated with Gleason grading. Each slide was divided into smaller blocks of 0.25 x 0.25mm^2, from which features were extracted using image processing. The features include statistical and spectral analysis of the shape and distribution of the glands, nuclei, and color intensities of the image blocks. The features, with their corresponding labels, are used in training a random forests classifier.
Results: A leave-one-patient-out approach was used in order to evaluate the performance of the automatic classifier. The resulting average accuracy, sensitivity, and specificity in detecting cancer are 93.5%, 85.9%, and 93.8%, respectively. Our current work on classification of low- vs. high-grade cancer is also promising, with accuracy, sensitivity, and specificity of 80.7%, 75.4%, and 85.6%, respectively.
Conclusions: A sensitive and rapid annotation of PCa on digitized slides can be achieved by signal processing and machine-learning techniques, promising detailed and consistent analysis of PCa for diagnosis and prognosis. In future work, we will correlate various patterns with outcomes in order to optimize histopathology-based prognosis of PCa.

MP-03.10

The new pattern "vascular complex" predicts worse prognosis in radical prostatectomy

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Introduction: In 2014, the International Society of Urological Pathology consensus meeting recommended a novel system for grading prostate cancer. Modifications were made to the definition of Gleason pattern 4 (GP4) to include four main architectural types: cribriform, glomeruloid, poorly formed glands, and fused glands. Recently, a novel pattern was described: vascular complex (VC), characterized by epithelial proliferations with delicate intervening fibrovascular cores. To date, VC is described as a borderline pattern of unknown prognostic significance. Our objective was to determine the prognostic impact of VC.
Methods: A total of 266 hormone-naïve radical prostatectomies, from 1990–2003, have been selected from the CHU de Québec-Université Laval biobank. Biochemical recurrence (BCR)-free survival was calculated using Kaplan-Meier method with log rank test, and the influence of VC was assessed in a Cox regression model.
Results: The prevalence of Gleason scores 6, 7, and ≥8 were 46.7%, 48.9%, and 4.4%, respectively. VC was observed in 48 cases and consistently associated with any of the other GP4 (47/48). Volumes of adenocarcinoma and percentages of high-grade were higher in the presence of VC (volume: 12.3 ± 12.2 vs. 6.3 ± 7.5; p<0.001; and percentage

of high-grade: 35.6 ± 32.1 vs. 15.7 ± 24.7; p<0.001). BCR-free survival rate in the presence of VC was lower (43.2% [23.6–61.5%] vs. 70.1% [62.0–76.9%]; p=0.0002). In the Cox regression model, VC was associated with poor prognosis by univariate analysis (hazard ratio 2.4 [1.47–3.93]; p=0.0004).
Conclusions: The VC is a new pattern associated of poor prognosis consistently associated with other GP4.

MP-03.11
Adjuvant vs. salvage radiotherapy for patients with adverse pathological findings radical prostatectomy: A decision analysis
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Study Groups: Canadian Urological Association Scholarship Foundation – Pfizer Urology Resident Grant.
Introduction: Patients undergoing surgery for prostate cancer who have adverse pathological findings experience high rates of recurrence. While data support adjuvant radiotherapy compared to a 'wait-and-watch' strategy to reduce recurrence rates, there are no randomized, controlled trials comparing adjuvant radiotherapy with the other standard of care, salvage radiotherapy (radiotherapy administered at the time of recurrence).
Methods: We constructed a health state transition (Markov) model employing two-dimensional Monte Carlo simulation using a lifetime horizon to compare the quality adjusted survival associated with postoperative strategies using adjuvant or salvage radiotherapy. Prior to analysis, we calibrated and validated our model using the results of previous randomized, controlled trials. We considered clinically important oncological health states from immediately postoperative to prostate cancer-specific death, commonly described complications from prostate cancer treatment, and other causes of mortality. Transition probabilities and utilities for disease states were derived from a literature search of MEDLINE and expert consensus.
Results: Salvage radiotherapy was associated with increased quality-adjusted life expectancy (QALE) (58.3 months) as compared to adjuvant radiotherapy (53.7 months), a difference of 4.6 months (standard deviation 8.8). Salvage radiotherapy had higher QALE in 53% of hypothetical cohorts. There was a small difference in overall life expectancy (-0.1 months). Examining recurrence rates, our model showed validity compared to available randomized, controlled data.
Conclusions: A salvage radiotherapy strategy appears to provide improved QALE for patients with adverse pathological findings following radical prostatectomy, compared with adjuvant radiotherapy. As these findings reflect population averages, specific patient and tumour factors, and patient preferences, remain central for individualized management.

MP-03.12
Incidence and predictors of clinical depression in men with prostate cancer
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Introduction: The presence, timing, and magnitude of effect of androgen-deprivation therapy (ADT) on anxiety and depression are controversial in prostate cancer (PCa) research. Although depression in PCs was previously linked only to men receiving ADT, our previous studies have demonstrated that men with PCa report high depressive symptoms, regardless of ADT treatment. This is a cross-sectional analysis of a two-year prospective cohort study investigating the incidence of clinical depression at baseline and evaluating biopsychosocial factors predictive of clinical depression in men with PCa.
Methods: 65 patients with local or advanced disease, on either a watchful waiting or ADT treatment protocol, were enrolled. Patients were assessed every three months from baseline with questionnaires to assess depression, anxiety, social factors, catastrophizing, and sexual function for two years.
Results: In total, 26.2% of men in this sample were classified as clinical depression cases according to the standardized Centre for Epidemiologic Studies–Depression Scale (CESD) measure. Testosterone concentration (odds ratio [OR] 1.41; p=0.022), along with pain catastrophizing (OR 1.20; p=0.018) and state anxiety (OR 1.18; p=0.008) were significant predictors of clinical depression following logistic regression. However, length of diagnosis, social support, and sexual function were not significant predictors of clinical depression.
Conclusions: In this prospective study, the incidence of clinical depression in men with PCa is higher than in the older adult general population. Further, testosterone concentration, pain catastrophizing, and state anxiety were shown to be predictors of clinical depression in men with PCa. This study highlights clinical significance of depression in this patient population and the need to address these issues as part of comprehensive treatment.

MP-03.13
Predictors of early disease-specific mortality among patients with prostate adenocarcinoma and bone metastasis at diagnosis
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Introduction: Two randomized trials have suggested a survival benefit for patients with high-volume metastatic prostate cancer (PCa) that initially receive chemotherapy. The purpose of this study was to assess the demographic and clinicopathological factors among patients with PCa bone metastasis at diagnosis and identify predictors of PCa-specific mortality (PCSM).
Methods: Patients with prostate adenocarcinoma were identified between 2010 and 2013 from the Surveillance, Epidemiology, and End Results (SEER) database (n=200 616). 8040 men presented with bone metastasis, forming the study cohort. Descriptive statistics were used to compare variables between patients experiencing PCSM and those that were alive/died of other causes. A competing risks model was performed to generate hazards ratios (HR) for the identification of predictors of PCSM.
Results: There were 2497 men (31.1%) experiencing PCSM and 5543 men (68.9%) without PCSM (n=643 dead of other causes; n=4900 alive) over a median followup of 35 months (interquartile range [IQR] 34–37). On univariate analysis, patients suffering PCSM were older, unmarried, had biopsy Gleason Group (bGG) 5 disease or no prostate biopsy, and had concomitant PCa brain, liver, and lung metastases at diagnosis compared to patients without PCSM. Competing risks modelling identified older age (hazard ratio [HR] 1.023; 95% confidence interval [CI] 1.019–1.027), non-black/white race (HR 0.77; 95% CI 0.62–0.95), unmarried status (HR 1.10; 95% CI 1.01–1.20), prostate-specific antigen (PSA) (HR 1.005; 95% CI 1.003–1.008), bGG 4 (HR 1.53; 95% CI 1.04–2.26), bGG 5 (HR 2.18; 95% CI 1.50–3.19), no prostate biopsy (HR 2.97; 95% CI 2.02–4.37), and brain (HR 1.48; 95% CI 1.05–2.10), liver (HR 2.18; 95% CI 1.79–2.65), and lung metastases at diagnosis (HR 1.33; 95% CI 1.13–1.56) as predictive of PCSM.
Conclusions: Men presenting with PCa bone metastatic disease have aggressive tumours and are at risk of PCSM in <3 years. Patients with prostate bGG 4–5 disease presenting with bone and concomitant visceral metastasis should be considered for early, aggressive systemic therapy and/or clinical trials.

MP-03.14

Personal prostate-specific antigen screening and treatment choices for localized prostate cancer among expert physicians

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Introduction: Prostate-specific antigen (PSA) screening for prostate cancer (PCa) and treatment choice for localized PCa remain controversial. The physician surrogate method identifies acceptable healthcare interventions by identifying those which physicians select for themselves. We surveyed urologists, radiation oncologists, and medical oncologists about their personal practices and recommendations to immediate family members regarding PSA screening and treatment.

Methods: A hierarchical, contingent survey was developed by consensus by a team of urologists, radiation oncologists, and medical oncologists. After piloting, it was electronically circulated to eligible members of the Canadian Urological Association; Genitourinary Radiation Oncologists of Canada; urologist, medical oncologist, and radiation oncologist members of the American Medical Association; Urological Society of Australia and New Zealand; and Confederacion Americana de Urologia. We characterized physicians' choices regarding PSA screening and PCa treatment. Among urologists and radiation oncologists, we assessed for correlation between specialty and treatment selection.

Results: Among 869 eligible respondents, 719 (83%) were urologists, 89 (10%) radiation oncologists, nine (1%) medical oncologists, and 53 other or undisclosed specialities. 784 respondents (90%) endorsed past or planned future screening for themselves (men) or for relatives (women). 30 (4%) men had been diagnosed with PCa and 16 (26%) women had recommended PCa treatment to an immediate family member. Among urologists and radiation oncologists, there was a significant correlation between physician specialty and treatment selection (Phi coefficient=0.61; p=0.001).

Conclusions: Physicians who routinely treat PCa are very likely to undertake PCa screening themselves or recommend it for their immediate family members. Among those diagnosed with prostate cancer, there is a significant correlation between specialty and treatment selection.

MP-03.15

The cost of treatment for localized prostate cancer

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Introduction: Treatment options for localized prostate cancer include radical prostatectomy (RP) and radiation therapy (RT). Initial treatment decisions can have long-term consequences that can result in complications, possible future secondary treatments, and significant economic impact.[1] We sought to compare five-year annual treatment-related complication (TRC) costs for patients treated with RP or RT for localized prostate cancer.

Methods: We performed a population-based, retrospective cohort study of all men who underwent RP or RT for clinically localized prostate cancer in Ontario, Canada from 2002–2009. Costs were determined using a validated costing algorithm using linked administrative databases for five years after treatment (including costs for initial treatment). Costs unrelated to management of prostate cancer or its TRC were excluded. Costs were adjusted for inflation. We matched men treated with RP and RT 1:1 using a propensity score.

Results: In total, 28 849 men underwent treatment for localized prostate cancer from 2002–2009 in Ontario. Men who underwent RT (n=12 675) were older, from less affluent neighborhoods, and had more comorbidities than men who underwent RP (n=16 174; p<0.001). Men who underwent RT had higher total five-year, per-patient, treatment-related costs than men who underwent RP ($16 716/patient vs. $13 213/patient), with a mean incremental difference of $3503/patient. Men who underwent RT had a lower relative cost in their first year after treatment, compared to those receiving RP (relative risk [RR] 0.97, 95% confidence interval [CI] 0.94–1.0; p=0.025). There was no difference in relative cost in Year 2 (p=0.1). In Years 3, 4, and 5, RT had a significantly higher relative cost than RP (p<0.05 for all).

Conclusions: Men who undergo RT have significantly higher five-year total treatment-related costs compared to men who undergo RP. Relative costs are higher in the first year for patients treated with RP and increasingly higher in subsequent years for patients treated with RT.

Reference:

1. Nam RK, Cheung P, Herschorn S, et al. Incidence of complications other than urinary incontinence or erectile dysfunction after radical prostatectomy or radiotherapy for prostate cancer: A population-based cohort study. *Lancet Oncol* 2014;15:223-31. https://doi.org/10.1016/S1470-2045(13)70606-5

MP-03.16

Prostate cancer anxiety in men undergoing active surveillance: Findings from a large, prospective, cohort study

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Introduction: Active surveillance (AS) is a widely established management strategy for low-risk prostate cancer (PCa). An estimated 5–13% of patients terminate AS and undergo treatment due to cancer-related anxiety. We present our findings from a large, prospective study that routinely inquired about cancer-specific anxiety in men undergoing AS.

Methods: 463 patients enrolled in AS from March 2000 through January 2016. Of these, 413 had completed a PCa quality of life survey as part of routine clinical care. Men were asked if PCa impaired their ability to plan for the future, if PCa resulted in distressing worries or thoughts, and if these thought have affected their mood. A liberal definition of anxiety was used; responses indicating "agreement" or "strong agreement" with any of the statements resulted in a label of PCa anxiety. Men were also asked to rank their overall state of health on a 10-point Likert scale. Generalized estimating equations were used to test the association between the risk of anxiety and age, martial status, prostate-specific antigen (PSA), Gleason score, number of positive cores, family history of PCa, or overall state of health, and length of time on AS.

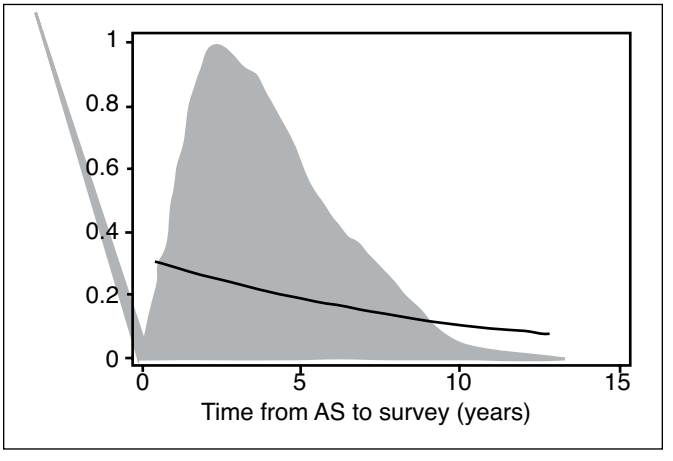

Fig. 1. MP-03.16. Risk of anxiety over time on active surveillance (AS).

Results: The median age of men on AS was 61 years with a median PSA at diagnosis 4.4 ng/ml; 95% of patients had Gleason 6 disease, 29% had a family history, and 81% were married. The median time from AS initiation to last survey was 3.7 years. The risk of anxiety decreased with time on AS (Fig. 1; odds ratio [OR] 0.87; 95% confidence interval [CI] 0.79, 0.95; p=0.003). Patients reporting higher overall health scores had lower anxiety levels, which lasted throughout the duration on AS (OR 0.83; 95% CI 0.74, 0.93; p=0.001). None of the other covariates of interest were significantly associated with the change in the risk of high anxiety after adjusting for time.
Conclusions: Although moderate levels of anxiety exist in men undergoing AS, it significantly decreases over time. This should be taken into consideration when counselling men on AS.

MP-03.17
Oncological outcomes of radiation therapy following active surveillance for low- and intermediate-risk localized prostate cancer

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Introduction: We aimed to evaluate the oncological outcomes and potential impact of delayed radical treatment in the form of radiotherapy (RT) in men with localized prostate cancer progressing after active surveillance (AS).
Methods: We identified patients on AS subsequently treated with RT (either dose-escalated image-guided intensity-modulated radiotherapy [IG-IMRT] or low-dose-rate brachytherapy [LDR-BT]). Based on the clinical characteristics at time of AS progression, oncological outcomes were compared to matched patients treated with upfront RT. One-to-two matching was conducted based on age (± 3 years), clinical prognostic factors (National Comprehensive Cancer Network [NCCN] risk group; prostate-specific antigen [PSA] ± 2 ng/mL; cT category; primary and secondary Gleason score; percentage of diagnostic cores involved dichotomized at < or >50%), and treatment modality (IG-IMRT or LDR-BT). We aimed to determine whether patients on AS have potentially compromised outcomes.
Results: We identified 215 patients undergoing RT after a median of 26 months (interquartile range [IQR] 16–52.5) on AS. Median followup post-RT was 4.8 years (IQR 2.9–7.2). No patient in the AS cohort died of prostate cancer. At five years, the biochemical relapse-free, metastases-free, and overall-survival rate were 98.6%, 99.1%, and 98.6%, respectively. Matched cohort comprised 400 patients treated IG-IMRT (71%) or LDR-BT (29%). Adequate was confirmed. The median followup past RT was 8.2 years (IQR 4.7–10). At five years, biochemical relapse-free, metastases-free, and overall survival rates were 98.5%, 98.7%, and 93.7% respectively, which were not statistically different compared to those patients treated upon AS progression.
Conclusions: Curative-intent radiotherapy (i.e., dose-escalated IG-IMRT or LDR-BT) after a period of AS renders excellent oncological outcomes at five years. Moreover, the delay of therapy after a period of AS does not appear to result in inferior oncological outcomes compared to patients with similar risk characteristics undergoing upfront radical radiotherapy.

MP-03.18
Does surgical delay for radical prostatectomy affect biochemical recurrence? A retrospective analysis from a Canadian cohort.

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Introduction: Given limitations to resources in a publically funded health care system, and after we explored the impact of surgical wait time (SWT) we sought to assess the impact of SWT to robot-assisted radical prostatectomy (RARP) on biochemical recurrence (BCR).
Methods: Retrospective review of 1258 patients-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 BCR, which was defined as two consecutive PSA ≥ 0.2 ng/dl, or PSA ≥ 0.4 ng/dl or salvage external beam radiation therapy and/or salvage androgen deprivation therapy. Patients were stratified according to D'Amico risk categories. Univariate and multivariate analyses with a Cox proportional hazards regression model were used to evaluate the effect of SWT and other predictive factors on BCR, in each risk group and on the overall sample. Variables included were age, BMI, surgical Gleason score, prostate volume, extra-capsular extension (ECE), positive surgical margins (PSM), seminal vesicles invasion (SVI), and positive lymph nodes (PLN).
Results: Of 812, 619 patients were eligible for analysis. Mean SWT was 153.2 [147.2 ; 159.15], 169.11[157; 181.2], 150.7 [143.4; 157.9], and 125.8 [108.8; 142.8] days, for overall, low, intermediate, and high risk patients, respectively. Multivariate analysis on the overall cohort did not show a significant relation between SWT and BCR. Pathological Gleason score (p=0.015) , ECE (p=0.013) and PSM (p<0.001) were independent predictors of BCR. On Subgroup analysis on D'Amico risk group. SWT was positively correlated to BCR in the high-risk group (p=0.001). On threshold analysis, cut off was found to be 90 days. SWT did not significantly affect BCR on univariate and multivariate analysis in the low and intermediate risk groups.
Conclusions: Increased delay to surgery in patients waiting for RARP could affect the BCR, as there was a positive association in the high-risk group. Further studies are needed to assess the impact of wait time on BCR, cancer specific survival and overall survival.

MP-03.19
Changes in the outcome of prostate biopsies after preventive task force recommendation against prostate-specific antigen screening

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Introduction: The American and Canadian Task Forces on Preventive Health Care (USPSTF & CTFPHC) have issued recommendations against prostate-specific antigen (PSA)-based screening for prostate cancer (PCa). The aim of our study was to evaluate the effect of these recommendations on the trends and outcomes of prostate biopsies.
Methods: We conducted a retrospective chart review of all patients diagnosed with PCa by prostate needle biopsies between 2010 and 2015 at McGill University Health Centre. Of those, 1231 patients were included for analysis. Comparison between patients diagnosed before with those diagnosed after the recommendations' release date was performed using Chi-square and Welch's t-tests.
Results: Using the USPSTF draft, released October 2011, as a cutoff, our study revealed that post-draft patients (n=782) had higher baseline PSA levels (median [interquartile range (IQR)] 7.8 ug/L [5.5–12.9] vs.6.5 ug/L [4.9–10.4]; p<0.001) when compared to pre-draft patients (n=449). Also, post-draft patients were more likely to have higher percent of cancer (≥34%) in biopsy cores (60.7% vs. 46.1%; p<0.001), as well as higher Gleason score (G7 [4+3] 15.9% vs. 12.7% and G8–10 31.9% vs.19.4%; p<0.001). Furthermore, they had higher D'Amico intermediate- to high-risk PCa classification (35.8% vs.32.7% and 35.4% vs.22.5%, respec-

tively; p<0.001). Over the study period, the biopsies rate showed an average decrease of 16.2% per year. Further analysis based on the CTFPHC guidelines, released October 2014, yielded similar results.
Conclusions: Our study results showed a reduction in the number of prostate biopsies performed over time following the preventive task force recommendations, as well as a significant relative increase in higher-risk PCa diagnosis. Further studies are required to examine the clinical outcomes associated with these changes.

MP-03.20
The efficacy of active surveillance in intermediate-risk prostate cancer

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Introduction: Numerous studies have demonstrated the indolent nature of low-risk prostate cancer (PCa). Active Surveillance (AS) is a means to avoid treatment-associated morbidity in men with low-risk PCa and select men with intermediate-risk PCa. We sought to evaluate outcomes among men with intermediate-risk PCa who were initially placed on AS compared with low-risk patients.
Methods: Patients being followed at the Manitoba Prostate Centre from January 1, 2004 to December 31, 2015 were included in our analysis. AS patients were identified by a retrospective electronic chart review of patients who received more than one prostate biopsy. Risk stratification definitions included a prostate-specific antigen (PSA) <10 ng/ml, Gleason score (GS) 6 or less, and clinical stage T1 to T2b disease for low-risk disease; and GS 3 + 4, PSA 10–20 ng/ml, or cT2c for intermediate-risk disease. Our primary outcome was the receipt of radical treatment for PCa. Among men who received radical prostatectomy (RP), pathological outcomes and the need for adjuvant therapy were compared between groups.
Results: This study included 271 prostate cancer patients, 84 (31%) of which were intermediate- and 187 (69%) were low-risk disease. After a median followup of 61 months, 42.2% of low-risk patients went on to receive radical treatment compared with 57.1% of intermediate-risk patients (p<0.05). The median time to treatment for low- and intermediate-risk patients was 35 months vs. 27 months, respectively. Among RP patients, 35.7% of patients in the low-risk group and 31.6% in the intermediate-risk group received adjuvant radiotherapy or androgen-deprivation therapy following surgery.
Conclusions: We demonstrate that intermediate-risk patients on AS are more likely to undergo radical therapy sooner than low-risk patients; however, we found no significant difference in pathological outcomes at RP or an increased need for multimodal therapy between groups. This suggests that select patients with intermediate-risk disease should be offered AS to delay morbidity of radical therapy.

MP-03.21
Impact of abiraterone acetate in post-docetaxel setting on the survival of metastatic castration-resistant prostate cancer patients: A population-based study in Quebec

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Introduction: Abiraterone was introduced in Quebec in 2012 for metastatic castration-resistant prostate cancer (mCRPC) in the post-docetaxel setting. This study described abiraterone use in the early post-approval period and its clinical effectiveness in Quebec, for both post-chemotherapy patients and patients unfit for chemotherapy.
Methods: A retrospective cohort study was conducted using Quebec public healthcare administrative databases. Our cohort consisted of mCRPC patients receiving abiraterone from 2012–2013 (n=303). The abiraterone group was stratified into abiraterone post-chemotherapy (n=99) and abiraterone without chemotherapy (n=204, unfit for chemotherapy and qualified for abiraterone with the "exception patient" measure). Study outcomes included overall survival, abiraterone duration, and hospitalization days. Cox proportional hazard regression was used to estimate the effectiveness of abiraterone in the post-docetaxel setting adjusted for several covariates.
Results: Our cohort consisted of 303 mCRPC patients treated with abiraterone (abiraterone post-chemotherapy: 99 and abiraterone "exception patient": 204). The median age was 75 years for the abiraterone post-chemotherapy group and 80 years for the abiraterone "exception patient" group. The corresponding median survivals were 12 and 14 months, respectively (log-rank test p=0.815). Risk of death was similar in the abiraterone post-chemotherapy and abiraterone "exception patient" groups (hazard ratio [HR] 0.89; 95% confidence interval [CI] 0.57–1.38).
Conclusions: Effectiveness of abiraterone in older patients who were chemotherapy-ineligible was similar to that of patients with prior docetaxel exposure. Overall, real-world survival benefits of abiraterone were similar to the results of the COU-AA-301 trial.

MP-03.22
The benefits of physiotherapy for stress urinary incontinence after open prostatectomy and robotic prostatectomy

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Introduction: Pelvic floor physiotherapy is prescribed for lower urinary tract symptoms (LUTS) after surgery. Effects of physiotherapy depending on the type of radical prostatectomy (open vs. robot-assisted laparoscopic) have not been well-studied. The objective of this study was to determine whether there were different effects of physiotherapy on LUTS between men who underwent open vs. robot-assisted radical prostatectomy (RP).
Methods: This study is a retrospective analysis of data collected by the Rapid Access Clinic 4 (RAC4) offered by the Prostate Cancer Centre in Calgary. Approximately 76% of men undergoing RP attend. These men could attend two free physiotherapy sessions if experiencing LUTS three months post-surgery. The International Consultation on Incontinence Questionnaires (ICIQ) and the overactive bladder-validated 8 (OAB-V8) screening questionnaire were used to measure LUTS prior to surgery, and three and nine months post-surgery. A random effects model was used to compare longitudinal changes.
Results: Data from 597 men was collected, 81 had a RP, attended physio, and consented to this study. Of these, 43 (53%) had an open RP, 38 (47%) a robot-assisted surgery. There were no significant differences between these groups in terms of age and health, or ICIQ (mean score open: 1.8, robotic: 2.9; p=0.21) and OAB-V8 (mean score open: 8.9, robotic: 10.3; p=0.47) scores before surgery. Both groups increased in LUTS three months post-surgery (ICIQ mean score open: 11.9, robotic: 10.4; OAB-V8 mean score open: 12.9, robotic: 14.3). These improved nine months post-surgery (ICIQ mean score open: 7.3, robotic: 8.1; OAB-V8 mean score open: 9.0, robotic: 9.6), but did not differ across type of RP (ICIQ p=0.80; OAB-V8 p=0.36).
Conclusions: The effects of physiotherapy on LUTS did not differ based RP type. Both groups had increased LUTS three months post-surgery. These symptoms were reduced by nine months, but ICIQ values were higher compared to pre-surgery. A more rigorous, controlled study to examine the effects of physiotherapy post-prostatectomy is needed.

MP-03.23

Active surveillance for management of favourable-risk prostate cancer at Princess Margaret Cancer Centre: Long-term followup and outcomes

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Introduction: Active surveillance (AS) is accepted as a treatment option with comparable outcomes to definitive therapy in men with favourable-risk prostate cancer (PCa). We seek to analyze the long-term outcomes in a large AS cohort at a tertiary academic institution.

Methods: Men enrolled in AS program at Princess Margaret Cancer Centre (PMCC) between 1992 and 2013 were identified. All patients satisfied the enrollment criteria at diagnostic biopsy: prostate-specific antigen (PSA) ≤10, clinical stage ≤cT2, Gleason sum ≤6, number of positive cores ≤3, no single core >50% involved, and age ≤75 years. Disease reclassification rate, delayed intervention rate, overall survival, disease-specific survival, and metastases rate were described. Regression models were used to identify baseline patients' characteristics associated with outcomes of interest. All statistical analyses were done using SAS®.

Results: Among 1122, the median followup time was 56 months (interquartile range [IQR] 30–92 months). 26 patients (2.1%) died, with PCa being the sole cause of death in two (0.2%) patients. Metastasis occurred in seven (0.6%) patients. The five and 10-year cumulative incidence of any biopsy reclassification was 28% and 40%, respectively. 305 patients received definitive treatment. Grade reclassification was the main reason for definitive treatment (31%). The cumulative incidence of treatment at five and 10 year was 21% and 26%, respectively. On regression analysis, number of positive cores and percent positive core at initial diagnostic biopsy were predictors of overall progression.

Conclusions: Managing favourable-risk PCa with AS appears to be safe and feasible with low risk of metastasis and cancer-specific death. With concurrent goals of reducing overtreatment and identifying lethal tumours while curable, AS has evolved into a well-accepted management strategy for appropriately selected men.

Poster Session 4: GU Oncology 1
June 25, 2017; 1600–1730

IPD-04.01

Intravenous mannitol vs. placebo during partial nephrectomy: A double-blind, clinically integrated, randomized trial

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Introduction: Renal hilar clamping during nephron-sparing surgery (NSS) generates renal ischemia, which may result in ischemic renal injury. Traditionally, mannitol has been used as renal protective agent to mitigate the effects of renal ischemia during NSS. Our objective was to assess the significance of mannitol infusion prior to renal ischemia during NSS on renal functional outcomes after surgery.

Methods: A prospective, randomized, placebo-controlled, double-blind, phase 3 trial was conducted between 2012 and 2015 in 199 patients with a renal cortical mass scheduled for NSS. Patients were randomized to mannitol or normal saline solution placebo infusion within 30 minutes prior to vascular occlusion of the renal artery. Postoperatively, eGFR was obtained at 6 weeks and 6 months. A nuclear medicine renal scan was obtained pre operatively and at the final 6-month endpoint.

Results: At baseline, the median age of the patients (37% of whom were women) was 58, and the median eGFR was 88 ml/min/1.73m2. Comparing placebo with mannitol infusion, the adjusted difference of 0.2 eGFR units at 6 months was not significant (P=0.9), with the upper bound of the 95% CI (-3.1 to 3.5) excluding a clinically relevant effect of mannitol. Similarly, the adjusted difference of -2.6 eGFR units at 6 weeks was not significant (95% CI, -5.8 to 0.7; P=0.12), nor was the median split function on 6-month nuclear medicine renal scan (adjusted difference -1.7, 95% CI, -3.8 to 0.4, P=0.11), or grade 3-5 complication rates (difference 3.2%, 95% CI -4.1% to 11%, P=0.4).

Conclusions: Intraoperative mannitol infusion during NSS has no demonstrable clinical benefit when compared with standardized fluid hydration, and its use in the nephrectomy setting is not warranted.

IPD-04.02

Molecular tumour grading and classification of non-muscle-invasive bladder cancer based on whole transcriptome analysis

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Introduction: Non-muscle-invasive bladder cancer (NMIBC) has a highly variable clinical behaviour not adequately predicted by histological grade and clinical parameters. Some are indolent; others quickly progress to muscle-invasive (MI) disease. The discrepancy between phenotype and genotype is compounded further by interobserver variability in pathological grading.

Methods: Whole transcriptomic (WT) analysis of 178 bladder tumours (158 NMIBC, 20 MIBC/metastatic) from Toronto, Canada and Paris, France, was performed from formalin fixed paraffin embedded tissues (FFPE) using discovery and validation cohorts. Data were integrated and tested for correlations with pathological grading and clinical outcomes. Both World Health Organization (WHO) 1973 (Grades 1, 2, and 3) and 2004 (low-grade [LG] vs. high-grade [HG]) pathological classifications were reviewed by three expert uropathologists and kappa statistic for interobserver variability calculated.

Results: Unsupervised clustering of RNA sequencing data revealed three robust-non-overlapping molecular subtypes of NMIBC termed grade-related index (GRI)1, GRI2, and GRI3. GRI1 comprised of almost exclusively LG tumours, while GRI3 clustered with HG muscle-invasive disease. The area under the curve (AUC) for WT to predict pathological grade was 0.96. Kappa for interobserver variability in 1973 and 2004 WHO grading classification was 0.41 and 0.78, respectively. Most discrepant cases clustered in GRI2. GRI independently predicted disease progression (hazard ratio [HR] 2.96; 95% confidence interval [CI] 1.70–5.13; p<0.001). Progression rates at five years of GRI2 (13.2%) and 3 (36.4%) differed significantly (p=0.003, Gray test), although most appear phenotypically HG. FGFR3 mutations and Hedgehog were strongly enriched in GRI1. GRI3 disease was associated with upregulation in APOBEC3B.

Conclusions: WT sequencing data delineated three molecular classes of NMIBC and improved prediction of disease progression from NMIBC to MI compared to conventional histological grading. WT analysis could be integrated into a new WHO classification.

IPD-04.03

The role of delayed orchiectomy following chemotherapy in metastatic germ cell tumours, the Princess Margaret Cancer Centre experience

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Introduction: Rarely, testicular germ cell tumours (TGCT) present with high-burden metastases and chemotherapy is initiated prior to removal of the clinically diagnosed testicular primary. The standard of care has been orchiectomy post-chemotherapy, as the testicle is considered a sanctuary site at risk for residual disease; however, several small studies have observed complete response in the testicle. We have studied predictors of post-chemotherapy primary pathology to define patients in whom orchiectomy could safely be avoided.

Methods: Using our prospectively maintained testicular cancer database, eTestis, from 1981–2016, we identified TGCT men who received first-line chemotherapy followed by orchiectomy. Demographic and clinical param-

eters, including tumour markers, scrotal ultrasound (US), and testicular and retroperitoneal pathology were analyzed. Logistic regression was used to identify factors associated with disease (teratoma or viable GCT) in the testicle.

Results: Of 37 patients, 17 (46%) had necrosis or fibrosis only, 18 (49%) had teratoma, and two (5%) had viable GCT (one with intratubular germ cell neoplasia [ITGCN], one with microscopic embryonal cell carcinoma). In patients that underwent post-chemotherapy retroperitoneal lymph node dissection (RPLND), pathology was concordant in 75%. Persistently elevated tumour markers following chemo (odds ratio [OR] 5.5; 95% confidence interval [CI] 1.33–22.73; p=0.015) and younger age (age <35: OR 8.00; 95% CI 1.40–45.76; p=0.019) were predictive of disease in the testicle (teratoma or viable GCT). All patients with teratoma or viable GCT had US abnormalities pre- and post-chemotherapy.

Conclusions: Our findings corroborate previous reports that complete responses can be achieved in the testicular primary and that the majority of residual disease represents teratoma. If our findings are verified in other series, it may be prudent to observe the post-chemotherapy testis, particularly in marker-negative, older (i.e., ≥35) population, and those with negative US.

IPD-04.04

Medication use and kidney cancer risk: A population-based study

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Study Groups: CUA-Pfizer Urology Resident Grant, Canadian Drug Safety and Effectiveness Research Network.

Introduction: Exposure to commonly prescribed medications may be associated with cancer risk; however, there is limited data in kidney cancer. Furthermore, methods of classifying cumulative medication exposure in previous studies may be prone to bias.

Methods: We conducted a population-based, case-control study using healthcare databases in Ontario, Canada. Individuals enrolled as cases were aged ≥66 years with an incident diagnosis of kidney cancer. For each individual enrolled as a case, we identified up to four individuals as controls matched on age, sex, history of hypertension, comorbidity score, and geographic location. Cumulative exposure to commonly prescribed medications hypothesized to modulate cancer risk were obtained using prescription claims data. We modelled exposure in four different fashions: 1) as continuous exposures using a) fractional polynomials (which allow for non-linear relationship between an exposure and outcome) or b) assuming linear relationships; and 2) as dichotomous exposures denoting a) ≥3 vs. <3 years exposure or b) 'ever' vs. 'never' exposure. We used conditional logistic regression to estimate the association of medication exposure on incident kidney cancer.

Results: We studied 10 377 incident cases of kidney cancer and 35 939 matched controls. The directions of association were relatively consistent across analyses; however, the magnitudes were sensitive to the method of analysis. When using fractional polynomials, increasing cumulative exposure to acetylsalicylic acid, selective serotonin reuptake inhibitors, and proton-pump inhibitors were associated with significantly reduced risk of kidney cancer, while increasing exposure to antihypertensive drugs was associated with significantly increased risk (Table 1).

Conclusions: Our study provides impetus to further explore the effect of commonly prescribed medications on carcinogenesis to identify modifiable pharmacological interventions to reduce the risk of kidney cancer.

IPD-04.04. Table 1. Cumulative use of medication exposure modelled with fractional polynomials on risk of incident kidney cancer

	Cumulative use (OR [95% CI])									
	0–6 months	6–12 months	12–18 months	18–24 months	24–30 months	30–36 months	36–42 months	42–48 months	48–54 months	54–60 months
Angiotensin-converting enzyme inhibitors	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.01)	1.01 (1.01–1.01)	1.01 (1.01–1.02)	1.02 (1.01–1.03)	1.03 (1.02–1.04)	1.04 (1.02–.05)	1.05 (1.03–1.07)	1.06 (1.04–1.09)
Angiotensin II receptor blockers	1.01 (1.01–1.02)	1.04 (1.03–1.05)	1.06 (1.04–1.08)	1.09 (1.06–1.12)	1.11 (1.08–1.15)	1.14 (1.10–1.19)	1.17 (1.11–1.23)	1.20 (1.13–1.27)	1.23 (1.15–1.31)	1.26 (1.17–1.35)
Acetylsalicylic acid	0.96 (0.94–0.98)	0.90 (0.86–0.95)	0.86 (0.79–0.93)	0.82 (0.74–0.90)	0.78 (0.69–0.88)	0.74 (0.64–0.86)	0.71 (0.61–0.84)	0.69 (0.57–0.82)	0.66 (0.54–0.81)	0.63 (0.51–0.79)
Beta blockers	1.13 (1.07–1.20)	1.07 (1.04–1.11)	1.06 (1.03–1.09)	1.05 (1.03–1.07)	1.04 (1.02–1.06)	1.04 (1.02–1.06)	1.04 (1.02–1.05)	1.03 (1.02–1.05)	1.03 (1.02–1.05)	1.03 (1.03–1.04)
Calcium channel blockers	1.00 (1.00–1.00)	1.00 (1.00– 1.00)	1.00 (1.00–1.00)	1.01 (1.00–1.01)	1.01 (1.00–1.01)	1.01 (1.01–1.02)	1.02 (1.01–1.03)	1.03 (1.01–1.04)	1.03 (1.01–1.05)	1.04 (1.02–1.07)
NSAIDs	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Selective serotonin reuptake inhibitors	0.93 (0.91–0.96)	0.84 (0.79–0.89)	0.76 (0.69–0.84)	0.70 (0.62–0.80)	0.65 (0.56–0.76)	0.60 (0.50–0.72)	0.56 (0.46–0.69)	0.52 (0.41–0.66)	0.49 (0.38–0.63)	0.46 (0.35–0.60)
Proton-pump inhibitors	1.03 (1.02–1.04)	0.98 (0.98–0.99)	0.96 (0.95–0.97)	0.95 (0.94–0.96)	0.94 (0.93–0.96)	0.93 (0.92–0.95)	0.93 (0.91–0.95)	0.92 (0.90–0.94)	0.92 (0.90–0.94)	0.91 (0.89–0.93)

CI: confidence interval; NSAIDs: non-steroidal anti-inflammatory drugs; OR: odds ratio.

IPD-04.05

Perioperative chemotherapy does not improve disease-free survival in upper tract urothelial carcinoma: A population-based analysis

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Introduction: Upper tract urothelial carcinoma (UTUC) accounts for <5% of all urothelial cancers (UC). The role of perioperative chemotherapy, whether adjuvant or neoadjuvant, remains poorly defined. Current practice is derived from evidence related to muscle-invasive bladder cancer (BC). Our objective was to evaluate the impact of chemotherapy in UTUC patients over the past three decades using a large national database.

Methods: The Surveillance, Epidemiology, and End Results (SEER) database was queried for all patients with UTUC from 1988–2013. Data collected consisted of demographic and clinical parameters, and whether chemotherapy was given. Patients were analyzed as to whether they received perioperative chemotherapy or not. Cancer-specific (CSS) and overall survival (OS) were compared between both groups. Finally, multivariate analyses (MA) were performed to determine covariates associated with CSS and OS.

Results: This cohort included 20 407 patients with UTUC. For this analysis, patients coded as MXNX or M1 were eliminated in order to determine the efficacy of chemotherapy in a strict cohort of non-metastatic patients (n=9704). Table 1 presents the demographic, pathological, and followup data. In total, 16.3% of patients received perioperative chemotherapy. In terms of survival (Table 2), covariates associated with diminished CSS include increasing age, stage, and grade. Furthermore, variables associated with impaired OS include male gender, and increasing age and stage. Importantly, perioperative chemotherapy did not improve either CSS or OS (p=0.14 and p=0.777, respectively).

Conclusions: These data suggest that the benefits of chemotherapy in this population are not significant. Furthermore, these data, limited by their retrospective and administrative nature, add to the increasing body of knowledge suggesting that UTUC may represent a distinct clinical phenotype of UC compared to BC. Further investigation is warranted to better understand this clinical conundrum.

IPD-04.05. Table 1. Demographic, pathological, and followup data

	Chemotherapy	No chemotherapy	p
Number of patients (%)	1584 (16.3%)	8120 (83.7%)	
Mean age (SD)	68 (10.3)	73.6 (10.9)	<0.001
Patients <50 years of age (%)	6.1%	2.8%	<0.001
Race (%)			
White	81.8%	82.1%	0.53
Black	5.1%	4.4%	
Other	13.1%	13.4%	
Gender (%)			
Male	61.8%	59.4%	0.077
Female	38.2%	40.6%	
Mean tumour size (cm) (SD)	4.43 (2.7)	3.83 (2.3)	<0.001
Laterality (%)			
Right	48.4%	49.4%	0.2
Left	51.5%	50.5%	
Bilateral	0.2%	0.1%	
Location of tumour (%)			
Renal pelvis	61%	60.2%	0.57
Ureter	39%	39.8%	
Pathological grade (%)			<0.001
Well-differentiated	2.1%	6.3%	
Moderately differentiated	7.4%	19.1%	
Poorly differentiated	33.6%	30.6%	
Undifferentiated/ anaplastic	56.9%	44%	
T stage (%)			
T0	0%	0%	<0.001
T1	15.7%	40.8%	
T2	11.8%	19.5%	
T3	53.8%	30.7%	
T4	15.9%	5.9%	
TX	2.8%	3%	
N stage (%)			
N0	67.8%	93.7%	<0.001
N1	17.9%	3.9%	
N2	13.2%	2.3%	
N3	1.1%	0.1%	
Median followup time (months) (IQR)	22 (7–63)	22 (7–64)	0.73
Status at last followup (%)			
Alive	46.1%	50.5%	<0.005
Dead of disease	21.8%	14.2%	
Dead of other causes	32.1%	35.3%	

IQR: interquartile range; SD: standard deviation.

MP-04.01

A cost-effectiveness analysis of hexaminolevulinate blue light-assisted transurethral resection of bladder tumours in a universal healthcare system

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Study Groups: Funding - BioSyent, Inc.

Introduction: Previous studies have demonstrated cost-savings using hexaminolevulinate (HAL) blue light-assisted transurethral resection of bladder tumour (TURBT) compared to white light cystoscopy (WLC)-assisted TURBT for non-muscle-invasive bladder cancer (NMIBC) based on improved recurrence rates. The aim of this study was to perform a cost-effectiveness assessment of HAL blue light-assisted TURBT in a universal healthcare setting.

Methods: A previous study using raw data from randomized trials reported a meta-analyzed recurrence risk ratio (RR) for HAL- vs. WLC-assisted TURBT of 0.761;[1] this was used in the baseline decision-tree analysis. Our model was based on five years following initial TURBT, and cost variables were from Ontario (3522 new NMIBC cases/year). The model assumes that following initial HAL blue light-assisted TURBT: (1) recurrence monitoring for patients with NMIBC; (2) radical cystectomy for muscle-invasive disease; and (3) all future TURBTs are conducted with WLC assistance.

Results: The initial cost of a HAL blue light-assisted TURBT provincial program was $9 620 422. The five-year amortized cost of using HAL blue light assistance on every patient was $4 832 909 and cost per patient was $1372, resulting in 338 fewer recurrences. If HAL blue light-assisted TURBT were only used in patients deemed on cystoscopy to be at risk of carcinoma in situ (CIS), the five-year amortized cost would be $484 327, with a price per case of $1528. If HAL blue light-assisted TURBT were only used for cystoscopically appearing aggressive tumours, the five-year amortized cost would be $3 874 098, with a cost per patient of $1222. To date, no HAL blue light-assisted TURBT studies have demonstrated

IPD-04.05.Table 2. Multivariate Cox proportional hazard analysis predicting CSS and OS in UTUC patients

	CSS				OS			
	p	HR	95% CI for HR		p	HR	95% CI for HR	
			Lower	Higher			Lower	Higher
Sex								
Male		Reference				Reference		
Female	0.837	1.013	0.894	1.149	0.013	0.914	0.851	0.981
Race								
White		Reference				Reference		
Black	0.937	0.987	0.708	1.376	0.125	1.146	0.963	1.365
Other	0.437	1.069	0.904	1.263	0.010	0.874	0.790	0.968
Age at diagnosis	<0.001	1.015	1.008	1.021	<0.001	1.026	1.022	1.030
Primary site summary	0.308	0.930	0.809	1.069	0.177	1.053	0.977	1.136
T stage								
T1		Reference				Reference		
T2	<0.001	1.567	1.239	1.981	<0.001	1.301	1.164	1.455
T3	<0.001	2.433	2.006	2.952	<0.001	1.613	1.467	1.773
T4	<0.001	3.799	2.988	4.830	<0.001	2.140	1.869	2.450
TX	0.023	2.592	1.140	5.895	.149	1.442	.877	2.372
Tumour size in mm	<0.001	1.004	1.002	1.007	.548	1.000	.999	1.002
N stage								
N0		Reference				Reference		
N1	<0.001	1.708	1.408	2.072	<0.001	1.511	1.332	1.713
N2	0.197	1.177	0.919	1.507	.081	1.152	0.983	1.351
N3	0.062	1.831	.969	3.458	.015	1.744	1.116	2.725
Grade								
Well-differentiated		Reference				Reference		
Moderately differentiated	0.509	1.222	0.674	2.215	0.112	0.845	0.687	1.040
Poorly differentiated	0.002	2.381	1.362	4.163	0.620	1.050	0.865	1.276
Undifferentiated/anaplastic	0.007	2.151	1.234	3.748	0.117	0.858	0.708	1.039
Chemotherapy	0.141	0.887	0.757	1.040	0.777	1.015	0.918	1.121

CI: confidence interval; CSS: cancer-specific survival; HR: hazard ratio; OS: overall survival; UTUC: upper tract urothelial carcinoma.

improvement in progression; however, if there were a 20% improvement, five-year amortized cost would be $2 660 529 and $755 per patient.

Conclusions: HAL blue light-assisted TURBT decreases recurrences in patients with NMIBC, with a five-year provincial cost of $4 832 909. Using the current model, additional research is required to assess if this technology provides cost savings beyond five years.

Reference:

1. Burger M, Grossman HB, Droller M, et al. Photodynamic diagnosis of non-muscle-invasive bladder cancer with hexaminolevulinate cystoscopy: A meta-analysis of detection and recurrence based on raw data. *Eur Urol* 2013;64:846-54. https://doi.org/10.1016/j.eururo.2013.03.059

MP-04.02

A prospective study on the impact of radical cystectomy on sexual function in females with bladder cancer

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Introduction: The true effect of radical cystectomy (RC) on female sexual function is poorly described. The aim of this study is to prospectively report baseline and postoperative sexual function in a group of females undergoing RC.

Methods: 74 females undergoing RC for bladder cancer were enrolled from 2008–2014 in a prospective quality of life study. The Female Sexual Function Index (FSFI) was administered one month prior to RC, and six and 12 months postoperatively. Latent transition analysis (LTA) was conducted at all three points in time in order to assign patients to homogeneous groups based on their survey responses. Group membership was modeled by marital status, type of urinary diversion, vaginal reconstruction, and administration of neoadjuvant chemotherapy. LTA was also used to estimate the transitions between groups over time.

Results: 60 patients completed baseline surveys and 47 (64%) at one year following cystectomy. Median age of the cohort was 66 years (interquartile range [IQR] 59,72) and 62 patients (84%) underwent vaginal reconstruction with RC. LTA revealed that at baseline, 65% of patients provided survey responses that were characterized as having 'no sexual activity' (Group 1), 17% 'limited sexual function' (Group 2), and 18% 'adequate sexual function' (Group 3). The distributions were relatively stable one year after RC (65%, 21%, and 14% for the three groups, respectively). Analyzing transitions between preoperative grouping and one-year postoperative revealed that 44% of patients with adequate sexual function

(Group 3) remained in the same group. In Group 2, 33% remained in the same category. For patients reporting no sexual activity preoperatively, 87% remained in the same category at one year, but 8% and 5% transitioned to Groups 2 and 3, respectively. Being married was significantly associated with sexual function after surgery (p<0.001). No statistically discernible association was found based on the type of urinary diversion, vaginal reconstruction, or the administration of neoadjuvant chemotherapy.

Conclusions: Although a large proportion of females are not sexually active either before or after RC, one-third of patients in this study maintained some form of sexual function, with a small proportion demonstrating improvement at one year. Enhanced understanding of preoperative and postoperative sexual function can lead to improved perioperative counselling and surgical planning for sexually active females undergoing RC.

MP-04.03

Outcomes of urothelial bladder cancer patients who had previous upper tract urothelial disease

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Introduction: Upper tract urothelial carcinoma (UTUC) accounts for <5% of all urothelial cancers. Studies show that urothelial bladder carcinoma recurrence (UBCR) occurs in 22–47% of de novo UTUC (dNUTUC) patients. Our goal was to compare UBCR rates, predictors, and disease-specific mortality (DSM) in different dNUTUC locations.

Methods: The Surveillance, Epidemiology, and End Results (SEER) database was queried for all patients with dNUTUC from 1988–2013 who developed UBCR. Data collected consisted of demographic and clinical parameters, including tumour location, as well as pathological and survival data. Patients were stratified according to their dNUTUC location (renal pelvis [RENPEL] vs. ureteral [UL]) and compared for time to UBCR and bladder cancer (BC) DSM.

Results: This cohort included 15 298 patients with dNUTUC. UBCR was diagnosed in 51.6% and 51.2% of RENPEL and UL tumours, respectively (p=0.639) (n=7179). Table 1 presents the demographic, pathological, and median followup data of the UBCR patients, stratified according to dNUTUC location. Approximately a fifth of these UBCRs are muscle-invasive. Covariates associated with UBCR include RENPEL tumours (odds ratio [OR] 1.318; 95% confidence interval [CI] 1.027–1.691; p=0.03), less advanced disease (OR 0.587; 95% CI 0.434–0.793; p=0.001), and dNUTUC surgical treatment (OR 5.78; 95% CI 1.846–18.106; p=0.003). Interestingly, 50% and 75% of the dNUTUC patients are diagnosed with UBCR within 67 and 133 months, respectively, with higher grade UBCRs being diagnosed earlier. Survival data shows age, black race, and more advanced disease being predictors of BC DSM (Table 2).

Conclusions: These data suggest that RENPEL dNUTUC tumours carry a higher risk for developing UBCR, especially when less advanced and treated surgically. Postoperative followup of dNUTUC patients should include routine cystoscopies for at least 11 years to diagnose 75% of UBCR. Worse BC DSM is associated with black race and older patients with more advanced disease.

MP-04.04

Rates of treatment for muscle-invasive bladder cancer in Ontario, Canada: A province-wide analysis

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Study Groups: Ajmera Family Chair in Urologic Oncology.

Introduction: Global analysis of the incidence of bladder cancer suggests a decrease within industrialized countries, felt to correspond to declining rates of tobacco use. We examined population-based rates of bladder cancer and their treatment over a contemporary 20-year period in Ontario.

MP-04.03. Table 1. Demographic, clinical and pathological data of patients with dNUTUC tumours developing secondary urothelial bladder tumours

	dNUTUC renal pelvic tumours	dNUTUC ureteral tumours	p
Number of patients (%)	4780 (66.6%)	2399 (33.3%)	
Mean age (SD)	70.7 (11.7)	71 (11.8)	0.328
Race (%)			
White	90.3%	91.6%	
Black	5.2%	4.9%	0.173
Other	4.5%	3.6%	
Gender (%)			
Male	75.1%	74.9%	0.87
Female	24.9%	25.1%	
Mean tumour size (cm) (SD)	3.4 (2.67)	3.5 (2.2)	0.554
Type of surgery (%)			
No surgery	6.2%	6.4%	
Local therapy (without pathology)	0.8%	0.5%	
Transurethral resection of bladder tumour	80.2%	79.6%	0.225
Partial cystectomy	2.2%	1.7%	
Radical cystectomy	10.7%	11.7%	
Pathologic grade (%)			
Well-differentiated	17.4%	16.8%	
Moderately differentiated	34.4%	34.6%	
Poorly differentiated	25.8%	26.1%	0.937
Undifferentiated/anaplastic	22.3%	22.5%	
T stage (%)			
Tis	5.9%	5.2%	
Ta	49.3%	48.4%	
T1	25.5%	24.6%	
T2	11.4%	12.3%	0.17
T3	4.9%	6.2%	
T4	2.9%	3.4%	
N stage (%)			
NX	12.6%	12.5%	
N0	84.9%	84.6%	
N1	1.3%	1.5%	0.891
N2	1.1%	1.2%	
N3	0.2%	0.2%	
M stage (%)			
MX	4%	4.1%	
M0	93.1%	92.7%	0.735
M1	2.9%	3.2%	
Median followup time (months) (IQR)	49 (17–99)	44.5 (16–97)	0.409
Status at last followup (%)			
Alive	49.7%	47.9%	
Dead of disease	14.7%	15%	0.336
Dead of other causes	35.6%	37.1%	

dNUTUC: de novo upper tract urothelial carcinoma; IQR: interquartile range; SD: standard deviation.

Methods: We performed an interrupted time-series analysis using segmented regression of all patients diagnosed with bladder cancer from 1994–2014 in Ontario. Using administrative databases, we identified patients who received treatment for muscle-invasive bladder cancer (MIBC), defined

MP-04.03. Table 2. Multivariate Cox proportional hazard analysis predicting urothelial bladder carcinoma-specific mortality in patients with de novo upper tract urothelial disease

	p	HR	95% CI for HR	
			Lower	Upper
Sex (reference female)	0.097	0.883	0.762	1.023
Age	0.000	1.047	1.040	1.054
Race (White reference)				
Black	0.000	1.628	1.247	2.124
Other	0.933	1.014	0.734	1.401
Grade	0.000	1.431	1.310	1.564
Primary site of de novo upper tract tumour (ureter reference)	0.812	0.983	0.854	1.131
T stage (Tis reference)				
Ta	0.159	0.706	0.434	1.146
T1	0.012	1.832	1.145	2.932
T2	0.000	4.594	2.862	7.373
T3	0.000	5.057	3.095	8.261
T4	0.000	6.224	3.730	10.387
N stage (N0 reference)				
N1	0.001	1.812	1.288	2.549
N2	0.000	2.604	1.895	3.579
N3	0.131	2.024	0.811	5.051
NX	0.000	1.506	1.255	1.807
M stage (M0 reference)				
M1	0.000	2.951	2.165	4.021
MX	0.212	1.454	0.808	2.618

CI: confidence interval; HR: hazard ratio.

as any combination of cystectomy, chemotherapy, and radiotherapy. We examined both crude, and age- and gender-standardized rates.
Results: From 1994–2014, 32 833 patients were diagnosed with bladder cancer. Median age was 72 years and 24 522 (75%) were male. 7009 patients (21%) underwent MIBC treatment within six months of diagnosis. Cystectomy alone was the most common treatment (n=3058, 44%) followed by chemotherapy alone (n=1493, 21%), radiotherapy alone (n=1051, 15%) and cystectomy with chemotherapy (n=776, 11%). Despite a significant decrease in the rate of bladder cancer diagnosis (34 cases per 1000 population/year; p<0.0001) (Fig. 1), there was a significant increase in rates of MIBC treatment (8.5 cases per 1000 population/year; p<0.0001) (Fig. 2). This persisted across age, sex, comorbidity, and rurality strata. Use of cystectomy alone (p<0.0001) decreased over time, while the use of cystectomy with chemotherapy (p=0.005), chemoradiotherapy (p<0.0001), and radiotherapy alone (p=0.005) increased.
Conclusions: Over the past 20 years, there has been a significant decline in the age- and sex-adjusted incidence of bladder cancer in Ontario; however, rates of treatment for MIBC have increased across all strata of patient demographics. Whether this reflects changing tumour characteristics, changing indications for MIBC treatments, or other behavioural or environmental factors remains to be determined.

MP-04.05
Single-institution comparison of pazopanib vs. sunitinib in metastatic renal cell carcinoma

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Introduction: Sunitinib and pazopanib are orally-administered tyrosine kinase receptor inhibitors (TKIs) approved as first-line therapy for the treatment of metastatic renal cell carcinoma (mRCC). The IMDC Heng criteria is a predictive prognostic model for patients with mRCC when stratified into 3 prognosis groups: favourable, intermediate and poor. We retrospectively compared the efficacy and safety of sunitinib and pazopanib as first-line therapy for patients with mRCC in our single institution database.
Methods: Retrospective analysis was done to compare progression-free survival (PFS) and side effects of sunitinib and pazopanib as first-line

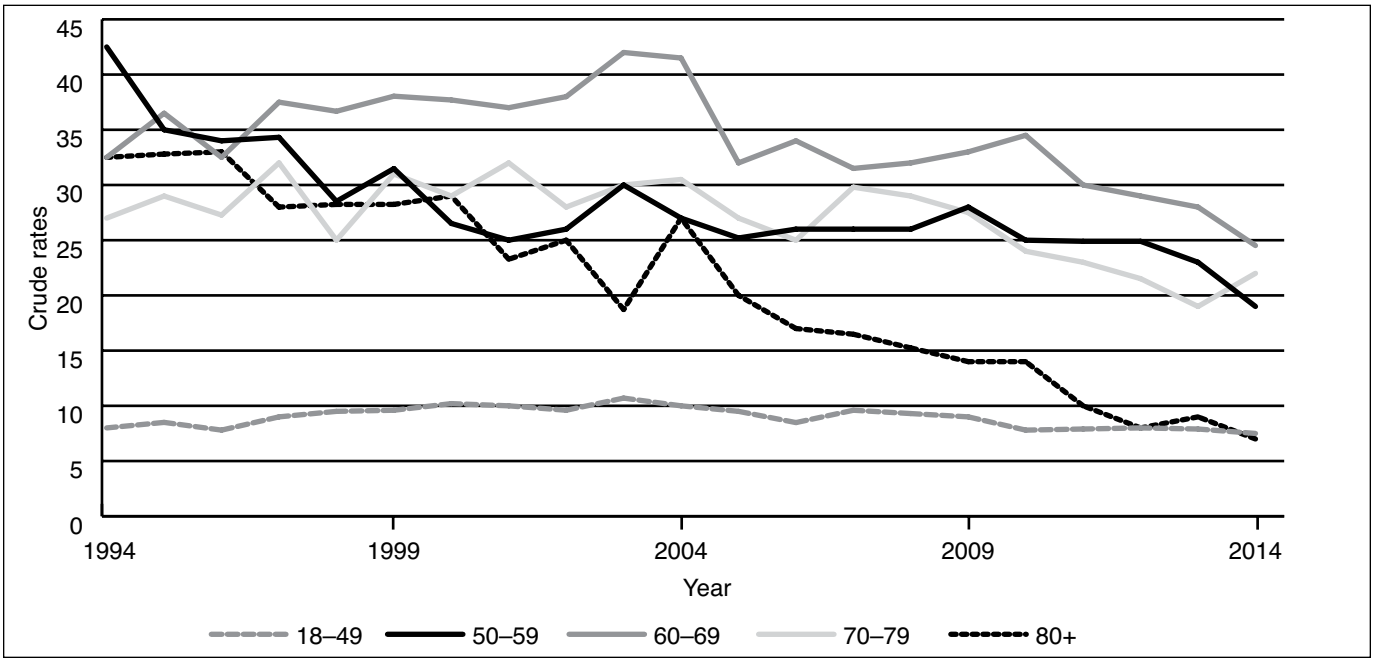

Fig. 1. MP-04.04. Bladder cancer cases diagnosed annually (per 100 000 of population), stratified by age.

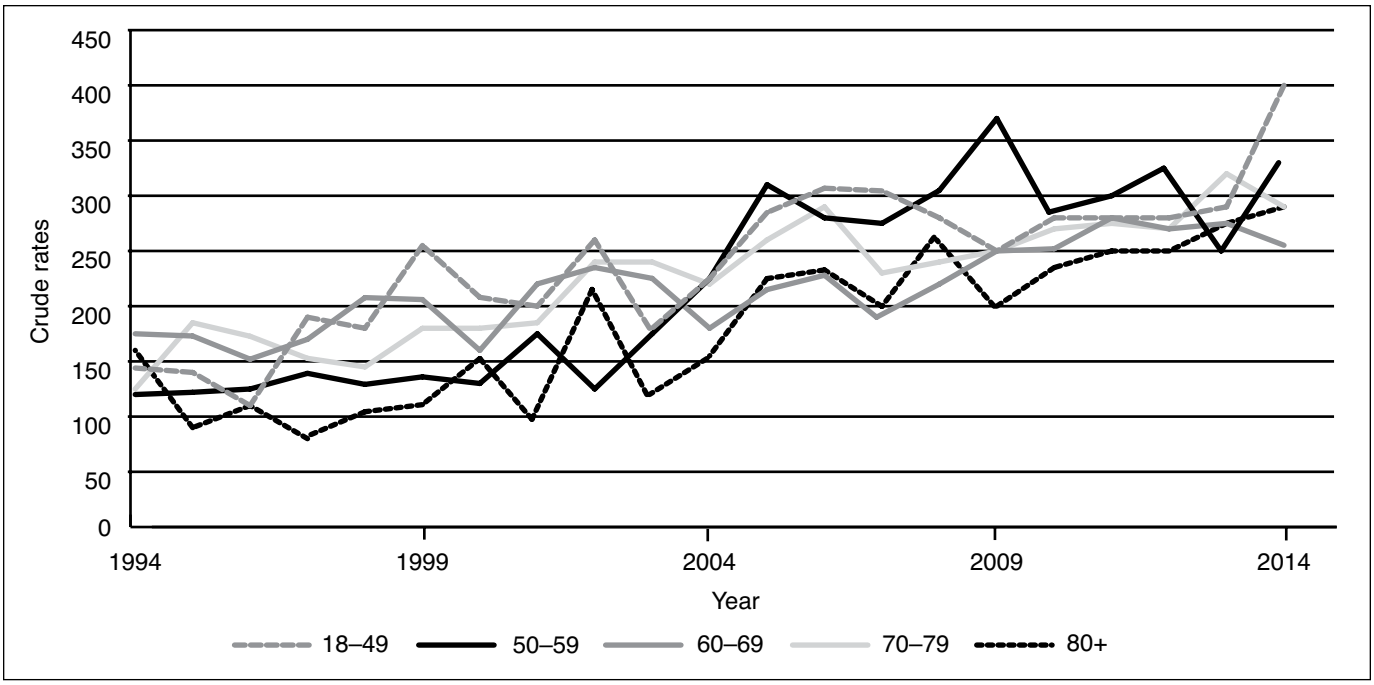

Fig. 2. MP-04.04. Bladder cancer cases receiving muscle-invasive bladder cancer (MIBC) treatment annually (per 1000), stratified by age.

therapy in patients with mRCC with a clear-cell histologic component. Patients were stratified into prognosis groups according to IMDC criteria. Disease assessment was performed on measurable aspects of disease based on CT or MRI reports. Survival analysis was performed using the Kaplan-Meier estimator and Cox regression, with disease progression as the endpoint.

Results: Data was obtained from 74 patients with mRCC who were treated with either sunitinib (n=51) or pazopanib (n=23). No significant median PFS difference was found between sunitinib and pazopanib (3.7 and 10.8 months, respectively, p=0.079). The HR for disease progression or all-cause death was 1.63 (95% CI, 0.95-2.81). When adjusted for IMDC criteria, the HR for PFS for sunitinib vs. pazopanib was 1.68 (95% CI, 0.94-3.01, p=0.078). No significant difference was found between IMDC prognostic groups (p=0.793). Patients treated with sunitinib had increased side effects compared to pazopanib, notably mucositis (24% vs. 0%), hair colour change (27% vs. 4%), neutropenia (14% vs. 0%), insomnia (10% vs. 0%) and eye edema (6% vs. 0%) (p<0.05). Incidence of diarrhea, nausea, decreased appetite, fatigue, hand-foot syndrome, vomiting and weight loss were similar (p>0.05).

Conclusions: Sunitinib and pazopanib are similarly efficacious as first-line therapy for mRCC. However, adverse events are lower with pazopanib.

MP-04.06

Needs assessment and development of a web-based educational tool for patients with germ cell tumours undergoing retroperitoneal lymph node dissection

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Introduction: Retroperitoneal lymph node dissection (RPLND) is a mainstay of multidisciplinary testis cancer treatment. Explaining this complex surgery is challenging and there are limited high-quality resources available to reinforce this teaching. We performed a needs assessment of patients who have undergone an RPLND in order to guide development of a web-based educational tool.

Methods: Patients who had previously undergone RPLND and were returning for followup to the Princess Margaret multidisciplinary clinic from May–August 2015 were identified. Semi-structured interviews were conducted to explore: 1) perceived educational gaps around their RPLND; 2) what resource modality would best fill these gaps; and 3) specific content that would be most helpful in an educational tool. Thematic analysis was used to identify recurring themes and ideals that were important for patients. Theoretical saturation was achieved with 15 patients.

Results: Overall, 87% felt an educational tool would be helpful and 100% preferred a web-based tool vs. a physical resource. 27% believed their surgical experience could have been improved and 33% felt some concerns were not appropriately addressed before surgery. The majority (67%) did research at home after their initial consent visit, using trusted and non-trusted websites. Finally, patients believed the following themes were necessary for the online tool: complications of RPLND with emphasis on fertility, expectations during recovery, information on the nerve-sparing technique, and information/reputation of the surgical team. All patients vouched for inclusion of patient testimonials to lessen anxiety.

Conclusions: Patients who have undergone RPLND feel they would have benefited from more educational resources, preferably a web-based module. We have subsequently used this information to design a module that will launch in early 2017. Future directions include surveying patients about their experience using this module.

MP-04.07

Cost-effectiveness of sunitinib vs. pazopanib in metastatic renal cell carcinoma in Canada using real-world data

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Introduction: Outside of controlled clinical studies, the understanding of the effectiveness and cost associated with targeted therapies for metastatic rencal cell carcinoma (mRCC) is limited. Therefore, the need for data from real-life patients is growing. The purpose of this study was to assess the cost-effectiveness of targeted therapies using real-world data.

Methods: A pan-Canadian database was used to select prospective patients with mRCC who received targeted therapy from January 2011 until June 2016. Patients had to have a confirmed histological diagnosis of mRCC with clear-cell subtype and receive targeted therapy. Survival curves (Kaplan-Meier and direct adjusted survival curves) were used to estimate the overall survival (OS). Cox regression was used to examine the effect of treatment controlling for demographic, disease, and treatment characteristics. The costs of drugs were estimated by using the average duration of treatment in each line of therapy. Incremental cost-effectiveness ratio was obtained by dividing the difference between the cost of treatments and the difference between the mean survivals.

Results: 376 patients received targeted treatment as part of the management of their disease and were included in the final analysis. The median time to treat in first-line for sunitinib and pazopanib patients was 7.7 and 5.9 months, respectively (p=0.0027). The adjusted OS with sunitinib was 33 months compared to 24 months with pazopanib, but there was not a statistically significant difference between the two groups. The median cost of therapy for sunitinib and pazopanib was $57 792 (95% confidence interval [CI] 23 063–119 456) and $47 872 (95% CI 28 039–89 041), respectively. The incremental cost-effectiveness ratio (ICER) of sunitinib is $11 905/life-year gained compared to pazopanib.

Conclusions: Our pan-Canadian database demonstrates longer survival for patients treated with sunitinib. This incremental survival is linked to a $11 905/life-year gained. Based on our real-world evidence, sunitinib is a cost-effective option compared to pazopanib in Canada.

MP-04.08

A review of partial nephrectomy in Alberta T1a renal cell carcinoma patients from 2002–2014

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Introduction: Partial nephrectomy (pN) for patients with T1a renal cell carcinoma (RCC) may prevent or delay chronic kidney disease when compared to radical nephrectomy (rN). Here we investigate changes in use of pN vs. rN over time and associated outcomes.

Methods: Patients diagnosed with T1a RCC in Alberta, Canada, from 2002–2014 that underwent pN or rN were identified through the Alberta Cancer Registry and Discharge Abstract Database. Patients were excluded if diagnosis and surgery could not be confirmed through manual chart review.

Results: In total, 1449 patients met the inclusion criteria, with a mean followup of 54 months. The median glomerular filtration rate (GFR) was 75.9. Significantly more patients received pN after the introduction of Alberta pN recommendations in 2007 (64.4%) compared to patients diagnosed before 2007 (37.3%) (p<0.001). In 2013/2014, 82.5% of patients receiving nephrectomy received a pN. Use of pN increased in a linear fashion after the introduction of guideline recommendations by 6.3% per year (linear regression r^2=0.845) as a proportion of total nephrectomies performed. Univariate analysis identified younger age (p=0.033) and higher GFR (p<0.001) as being associated with increased pN use. Multiple logistical regression analysis identified year of diagnosis (pre- vs. post-pN recommendations) as being significantly associated with rN use (odds ratio [OR] 2.857; 95% confidence interval [CI] 2.079–3.927; p<0.001), whereas GFR ≥90 was associated with decreased rN use (OR 0.648; 95%CI 0.497–0.846; p=0.001). Five-year overall survival was 95.7% vs. 90.2% in patients who received pN vs. rN, respectively (log-rank p=0.002).

Conclusions: Use of pN for patients with T1a RCC has increased significantly over time, accelerated by the introduction of guideline recommendations. GFR is a significant contributor to the decision to perform rN vs. pN. Patients who undergo pN have superior five-year overall survival compared to patients who undergo rN.

MP-04.09

Identifying the barriers to a more widespread adoption of renal tumour biopsy: Results of a Canadian-based survey

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Introduction: Renal tumour biopsies (RTBs) have been proposed as a way to identify the histology of small renal masses (SRMs) prior to treatment with the objective to decrease overtreatment. However, many urologists are still reluctant to adopt RTB as a standard of care. We designed a survey study to better characterize the uptake of RTB in the management of SRMs and to identify the barriers to a more widespread adoption.

Methods: The link to a web-based survey was sent to all registered email addresses of members (n=767) of the Canadian Urological Association and the Quebec Urological Association in June 2016. The survey contained questions regarding the physicians practice patterns, RTB use, and potential barriers of RTB.

Results: In total, 223 members responded to the survey (29%). Of these, 35 were excluded because of incomplete demographic responses or because they did not manage SRMs. Of the responders, 38 (20%) practiced in an academic centre, 72 (38%) in a university-affiliated centre, and 78 (41%) in a rural hospital. Only 12% of responders requested RTB in >75% of cases, while 53% never performed or performed RTB in <25% of cases. Physicians with urological oncology fellowship training were more likely to request a biopsy than their colleagues without such training. The greatest management-related barrier was the perception that biopsy won't alter management, while the risk of obtaining a non-diagnostic biopsy was reported as the greatest pathology-related barrier to a more widespread adoption of RTB in the management of SRMs.

Conclusions: RTBs continue to be underused in Canada. Despite existing evidence that RTB is a safe and useful diagnostic test, concerns about its accuracy and its ability to change clinical practice continue to be barriers to its adoption. A knowledge translation strategy is needed to address these concerns.

MP-04.10

An international survey on the use of thromboprophylaxis in urological surgery (ISTHMUS): Large practice variation within and between countries

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MP-04.10. Table 1. Results of an international survey on the use of thromboprophylaxis in urological surgery

	Open radical cystectomy			Open radical prostatectomy		
	Any mech (%)	Any pharm (%)	Extended pharm (%)	Any mech (%)	Any pharm (%)	Extended pharm (%)
Canada	92	99	97	79	93	53
Finland	95	99	99	88	88	67
Japan	96	70	19	98	14	0
	Robotic radical prostatectomy			**Open radical nephrectomy**		
	Any mech (%)	Any pharm (%)	Extended pharm (%)	Any mech (%)	Any pharm (%)	Extended pharm (%)
Canada	81	90	47	80	92	47
Finland	75	94	64	84	95	47
Japan	100	33	0	95	20	1

Mech: mechanism; pharm: pharmacological prophylaxis.

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Introduction: The use of thromboprophylaxis to reduce the risk of venous thromboembolism (VTE) in urological surgery is common, but not standardized. We have conducted an international survey to assess current practice variation.

Methods: We developed a survey on the use of mechanical and pharmacological thromboprophylaxis for three urological procedures: radical cystectomy, radical prostatectomy, and radical nephrectomy. The survey presented brief patient profiles that reflected a spectrum of VTE risk; respondents indicated their practice for each. Following pilot testing, we administered the survey to representative samples of urologists in Canada, Finland, and Japan. We calculated the proportion of: 1) any mechanical prophylaxis use; 2) any pharmacological prophylaxis use; and 3) extended pharmacological prophylaxis of more than two weeks. Variations within and between countries are described by procedure with descriptive statistics and chi-square and ANOVA analysis. Multivariable logistic regression was used to identify characteristics associated with discharge thromboprophylaxis.

Results: Overall response rate was 54% (Canada 216/385, 57%; Finland 109/179, 61%; and Japan: 244/487, 50%). Large between-country variation was observed in pharmacological prophylaxis for each procedure ($p<0.001$) (Table 1). Overall, urologists in Japan were less likely to prescribe pharmacological prophylaxis compared to Canada and Finland ($p<0.001$ for each procedure). For extended pharmacological prophylaxis, large within-country variation was found for prostatectomy and nephrectomy in Canada and Finland. Less within- and between-countries variation was present for mechanical prophylaxis (Table 1), which was most commonly used until ambulation or discharge. On multivariable analysis, use of extended pharmacological prophylaxis did not differ between residents and attending staff after adjusting for country.

Conclusions: We found large variation in clinical practice regarding pharmacological thromboprophylaxis within and between countries. This variation may be a reflection of inadequate evidence or inadequate knowledge of evidence. Evidence-based clinical guidelines may help optimize patient care and reduce problematic variation in practice internationally.

MP-04.11

Sequential electromotive mitomycin C and bacillus Calmette-Guerinin (BCG) comparison to traditional BCG for high-risk, non-muscle-invasive bladder cancer

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Introduction: One randomized, controlled trial suggested that electromotive administration of mitomycin C (EMMC) sequentially with bacillus Calmette-Guerin (BCG) is superior to standard BCG for high-risk, non-muscle-invasive bladder cancer (NMIBC); however, EMMC/BCG has not been widely adopted. Here, we compared outcomes of patients treated with EMMC/BCG vs. standard BCG therapy.

Methods: Patients treated between January 2013 and August 2016 for high-risk NMIBC with first-line EMMC/BCG or standard BCG therapy were identified retrospectively. One urologist treated routinely with EMMC/BCG, while two others treated with standard BCG without other selection bias. EMMC/BCG therapy consisted of nine cycles of induction, followed by monthly maintenance up to 12 months. Standard BCG was delivered as per the SWOG 8507 protocol. Recurrence was defined as any histologically confirmed high-grade urothelial carcinoma.

Results: EMMC/BCG was administered to 19 patients and standard BCG to 73, with a median followup of 15 and 19 months, respectively. Both groups had similar tumour histologies, with 47% and 41% of patients in the EMMC/BCG and BCG groups having T1 tumours, respectively; however, nearly one-third had Tis disease in the BCG group compared to 0 receiving EMMC/BCG. Approximately 20% of patients in both groups had disease recurrence, with a median time to recurrence of 16.2 and 7.6 months for EMMC/BCG and BCG, respectively ($p=0.69$; hazard ratio 0.795). 7/73 patients required cystectomy in the BCG group for progression to muscle-invasive disease (n=2) and BCG failure (n=5). In comparison, one patient in the EMMC/BCG group progressed to muscle-invasive disease. One and three patients had to stop therapy early for EMMC/BCG and BCG intolerance, respectively.

Conclusions: This is the first report on outcomes of EMMC/BCG therapy in Canada. Our data suggest similar oncological efficacy and tolerability for BCG and EMMC/BCG. Definitive conclusions will only be possible with longer followup and greater patient numbers.

MP-04.12

The natural history of large renal masses on active surveillance and expectant management

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Introduction: Surgical intervention is the standard of care for large renal masses (LRM); however, patients with competing risks may not be candidates for immediate intervention. This study illustrates our experience with active surveillance (AS) and expectant management of LRM ≥4 cm. We describe the growth rate of LRM under AS and overall outcomes.

Methods: Our institutional database identified 101 patients with renal masses ≥4.0 cm from 1993–2016. Inclusion criteria were those followed by serial imaging for at least six months without surgical intervention. Bosniak 1–2 cysts and clinically benign renal masses were excluded. We used ordinal least squares regression to calculate LRM growth rate (cm/year). Competing risk methods were used to estimate the probability of developing renal cell carcinoma (RCC) metastasis in the setting of death from other causes.

Results: The median age at diagnosis was 73 (interquartile range [IQR] 64, 80) with a median LRM size of 4.9 cm (IQR 4.0, 6.7). Median followup was four years (IQR 2.2, 7.3). Charlson comorbidity index was ≥2

in 59% of patients.19% of patients had or developed non-RCC metastatic disease from another malignancy. Median LRM growth rate was 0.4 cm/year (IQR 0.1, 0.8). AS was discontinued in 34 patients who underwent surgery after a median followup of 1.9 years; 88% had malignant disease. Median followup for patients who did not undergo surgery was 3.3 years (IQR 1.9, 5.0). In total, 10 patients developed metastatic RCC (three of whom died from RCC), and 29 patients died from other causes. Median followup for metastasis-free survivors was four years (IQR 2.2, 6.8). The five-year probability of non-RCC-related death and RCC metastasis was 26% and 7%, respectively.
Conclusions: In highly comorbid patients, AS and expectant management of LRM has a low likelihood for RCC progression, which is overshadowed by the risk of non-RCC-related death. This data supports the use of surveillance of LRM as an acceptable strategy for select patients with competing risks from other serious illnesses.

MP-04.13
Measuring up: Dynamic monitoring of radical cystectomy outcomes using risk-adjusted cumulative sum charts
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Introduction: Radical cystectomy (RC) is the gold standard treatment for non-metastatic muscle invasive bladder cancer. It is often followed by prolonged hospitalization with significant morbidity and mortality. Advances in perioperative care, anesthesia, and surgical techniques have all reduced complications. When rates of complications vary over time, difficulties arise in detecting meaningful changes because of variation in underlying patient risk factors. The objective of this study is to demonstrate a method of continuously monitoring serious adverse events in RC through the use of risk-adjusted cumulative summation (RA-CUSUM), a technique that addresses patient variability by adjusting for the baseline comorbidity of each patient.
Methods: We evaluated the outcomes of 30-day mortality, myocardial infarction, and thromboembolic events following RC. For each outcome, risks were estimated for each patient using S-MPM, Gupta Perioperative Cardiac Risk, and Caprini score. RA-CUSUM charts were constructed for each outcome using log-likelihood ratios of patient risk and "signaled" if an increase or decrease in event rate was detected, defined as a doubling or halving of odds ratios.
Results: Adverse events for 158 patients undergoing radical cystectomy were analyzed over a 10-year period (2001–2011). No difference in true event rates and mean calculated risks were detected in an initial cohort of 50 patients. Mortality stayed within control limits though the trend implied decreased mortality. Myocardial infarction, however, did signal an increase in event rate near the end of the monitoring period (Figs. 1, 2).
Conclusions: RA-CUSUM is an efficient and effective technique for dynamic monitoring of outcomes following RC. Using the technique, surgeons can detect satisfactory, improved, or diminished performance over time and infer causes. This tool may be used for analysis of individual performance or to compare surgeons, centres, or trainees with diverse case mixes.

MP-04.14
Does symptomatic recurrence predict survival in bladder cancer patients post-cystectomy? Results from a large Canadian cohort
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Introduction: Radical cystectomy (RC) and perioperative chemotherapy are the gold-standard treatment of localized muscle invasive bladder cancer. Unfortunately, the recurrence rate of urothelial carcinoma after radical treatment is high. The objective of this study was to determine if there is a difference in survival outcomes between symptomatic and asymptomatic disease recurrences following RC, which may impact surveillance protocols.
Methods: We performed a retrospective chart review of all individuals who underwent radical cystectomy with or without adjuvant chemotherapy at our institution between August 2001 and June 2016 (n=464). Difference in survival rates were assessed using Kaplan-Meier survival estimates with Cox-proportion hazards modeling.
Results: We identified 354 men and 103 women (median age: 69 years, interquartile range [IQR] 61–74) who underwent RC during the study period. Median American Society of Anesthesiologists (ASA) score was 3 (IQR 3–3), with 276 individuals being either current or former smokers. The most common T stage was pT4a (n=97/428, 23.0%), with urothelial cell carcinoma (n= 375/435, 86.2%), negative surgical margins (391/426,

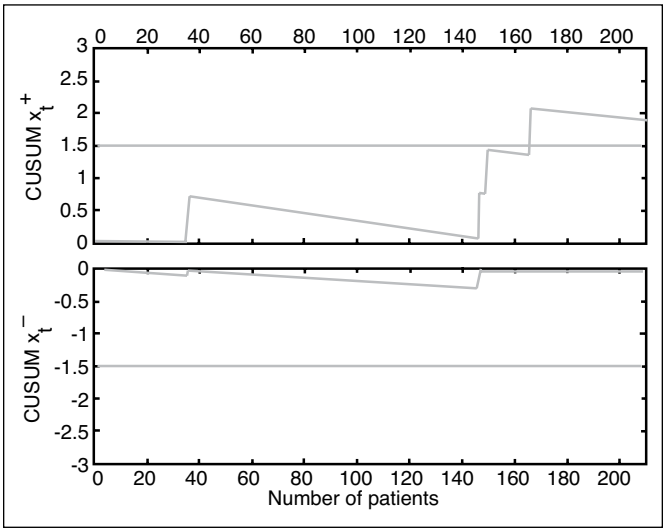

Fig. 1. MP-04.13. Cumulative log likelihood ratio-chart for perioperative myocardial infarction. Unacceptable increase in performance was set at odds ratio of 1.5.

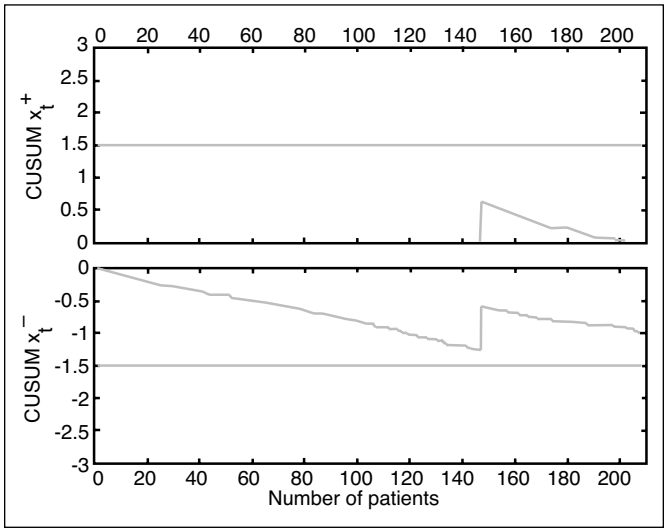

Fig. 2. MP-04.13. Cumulative log likelihood ratio-chart for 30-day mortality. Unacceptable increase in performance was set at odds ratio of 1.5.

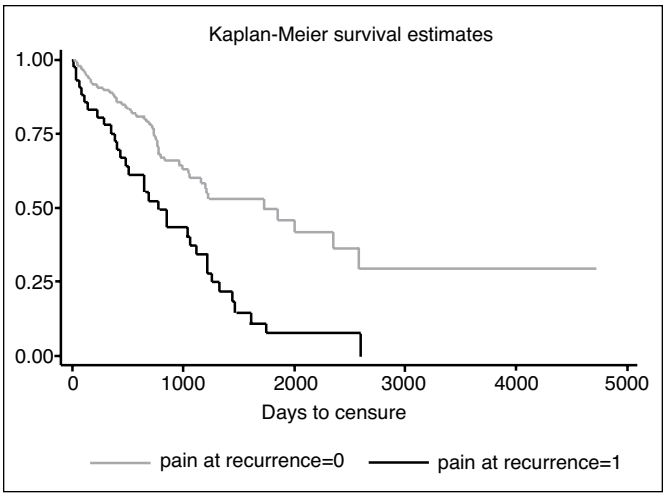

Fig. 1. MP-04.14. Kaplan-Meier survival estimates.

91.7%), and negative lymph nodes (338/432, 78.2%). 95 individuals (21%) received neoadjuvant treatment and 72 (17%) received adjuvant treatment. Kaplan-Meier survival curves were generated (Fig. 1) with Cox-proportion hazards modeling showed that pain at recurrence was significantly associated with earlier death (hazard ratio 2.48 95% confidence interval 1.60–3.83; p <0.01).

Conclusions: Pain as a symptom at recurrence of urothelial carcinoma is associated with poor survival. Patients complaining of pain at recurrence time post-cystectomy may want to consider earlier use of systemic treatments or clinical trials. Further studies evaluating other risk factors for survival and case-control analyses to adjust for potential confounders should be performed to further elucidate risk factors for poor survival post-cystectomy.

MP-04.15

S1605: Phase 2 trial of atezolizumab in bacillus Calmette-Guerin-unresponsive non-muscle-invasive bladder cancer

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Study Groups: Southwest Oncology Group, Canadian Cancer Trials Group, Alliance Oncology, ECOG-ACRIN Cancer Research Group.

Introduction: Radical cystectomy is the standard of care for patients with bacillus Calmette Guerin (BCG)-unresponsive, high-risk, non-muscle-invasive bladder cancer (NMIBC). Based on the reported efficacy of atezolizumab in metastatic urothelial carcinoma and the known expression of PD-L1 expression in NMIBC after BCG therapy, this trial will evaluate the activity of atezolizumab in BCG-unresponsive, high-risk NMIBC.

Methods: This is a single-arm, phase 2 trial testing systemic atezolizumab (1200 mg IV) every three weeks for one year in 135 patients with BCG-unresponsive, high-risk NMIBC. The study will enroll 70 patients with carcinoma in situ (CIS) (with or without concomitant Ta/T1) and 65 with Ta/T1 only. Patients with CIS at baseline will undergo mandatory repeat biopsy at six months, and all other patients only for suspected recurrence. Patients with persistent CIS, high-grade Ta/T1 recurrence, or progression to muscle-invasive or metastatic disease will be taken off treatment. The co-primary endpoints are: 1) complete response (CR) at six months in the CIS subgroup; and 2) event-free survival (EFS) at 18 months in the overall population. A hierarchical approach will be used to test the two co-primary endpoints. Secondary endpoints include duration of CR, as well as progression-free, cystectomy-free, bladder cancer-specific, and overall survival in all patients. Response will be correlated to expression of PD-L1 and CD8 by IHC, and to molecular subtypes and immune signatures by RNA-sequencing.

Results: If ≥28 (40%) CIS patients respond, the agent will be considered promising. This design has a significance level of 4.6% and a power of 96%. If the lower bound of the 90% confidence interval of the 18-month EFS excludes 20%, the investigators will conclude the regimen significantly improves EFS relative to historical data (type I error rate 0.05 and statistical power 0.93).

Conclusions: Successful completion of this trial could lead to a new treatment paradigm for patients with BCG-unresponsive, high-risk NMIBC.

MP-04.16

Hospital-level variation in renal cancer surgical care and its impact on patient outcomes

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Study Groups: Princess Margaret Hospital Foundation.

Introduction: Quality of care variations for renal cancer surgery remain unknown due to a lack of robust real-world data benchmarking provider performance. Consequently, the impact of quality variations on patient outcomes remains elusive. Here, we benchmarked hospital performance using case-mix adjusted quality indicators (QIs) to assess associations between receipt of poor quality care and patient outcomes.

Methods: Renal cancer patients undergoing surgery between 2004 and 2014 were identified from the National Cancer Database (NCDB). Hospital-level quality of care was assessed according to five disease-specific process and outcome QIs. Interhospital case-mix variation was adjusted for by multivariate modeling. Hospital performance was benchmarked against the national average using observed-to-expected ratio methodology, identifying hospitals providing substandard care. A composite measure of hospital quality, the renal cancer quality score (RC-QS), was derived and associations between RC-QS and surgical volume, academic affiliation, and patient mortality were determined.

Results: Over 1100 hospitals were benchmarked, with widespread hospital-level variation observed across each QI. For a given QI, 9–35% of hospitals were identified as providing substandard care. Hospitals identified as applying substandard care had lower referral volumes and were less academic as compared to higher-quality hospitals (p<0.001). Higher RC-QS was independently associated with lower 30-day, 90-day, and overall mortality (odds ratio [OR] 0.95, confidence interval [CI] 0.92–0.98; OR 0.94, CI 0.92–0.97; hazard ratio [HR] 0.97, CI 0.96–0.9 per unit increase, respectively).

Conclusions: Widespread variations in the quality of renal cancer surgery exist on a hospital-level, with poor hospital quality being associated with higher mortality. This data supports the use of the RC-QS as a national quality benchmarking tool for renal cancer surgery that provides audit-level feedback to hospitals and policymakers for quality improvement.

MP-04.17

Centralization of radical cystectomy for bladder cancer at the University of Alberta: Early results from a Canadian academic centre

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Introduction: Centralization of radical cystectomy (RC) to high-volume, fellowship-trained surgeons may improve clinical outcomes. At the University of Alberta, RC was centralized at a single institution and per-

formed by one of two urological oncologists starting in August 2013. Our objective was to compare outcomes of RC before and after centralization of care.
Methods: A retrospective analysis of data from the University of Alberta RC database was performed. Eligible subjects were those with histologically proven urothelial carcinoma of the bladder (cTanyN1-3M0) undergoing curative intent surgery. In the pre-centralization era (pre-centr),1994–2007, 523 patients were treated by one of 11 urologists at two academic hospitals. In the post-centralization era (post-centr), 2013–present, 134 patients were treated by one of two fellowship-trained urologists at one academic hospital. Outcomes were overall survival (OS), 90-day mortality rate, positive surgical margin (R1) resection rate, total number of lymph nodes evaluated, and 90-day blood product transfusion rate. The Kaplan-Meier method and multivariable regression analyses were used to analyze survival outcomes.
Results: The median followup duration in the pre- and post-centr era was 33 months and 16 months, respectively. The predicted two-year OS rate was 62% in the pre-centr era and 84% in the post-centr era (log rank p=0.0007; multivariable hazard ratio [HR] 0.40; 95% confidence interval [CI] 0.24–0.68; p<0.0001). Treatment in the post-centr era was associated with lower 90-day mortality (6.3% vs. 1.5%, multivariable odds ratio [OR] 0.23, 95% CI 0.06–0.99; p=0.049), R1 resection (13.0% vs. 1.5%; multivariable OR 0.07, 95% CI 0.01–0.51; p=0.009), and 90-day blood product transfusion (59% vs. 6%; p<0.0001), as well as higher total number of lymph nodes evaluated (7 vs. 30 lymph nodes; p<0.0001).
Conclusions: Surgical treatment in the post-centr era was associated with superior survival, cancer control, and perioperative outcomes.

MP-04.18
Renal manifestations of tuberous sclerosis complex in a Quebec cohort

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Introduction: The tuberous sclerosis complex (TSC) is an autosomal dominant genetic disorder often linked to TSC1 and TSC2 gene mutations. The clinical presentation of TSC is widely variable. We aimed to characterize the renal manifestations of a cohort of subjects with TSC in the province of Quebec.
Methods: We identified a cohort of 39 subjects followed at the TSC multidisciplinary clinic of a tertiary care centre. A retrospective chart review was performed from July 18, 2014 to October 14, 2016. Five subjects were excluded for lack of information or loss to followup. 13 cases were transfers from a pediatric tertiary care centre. 10 subjects had identified mutations of the TSC1 or TSC2 gene. The cohort included 18 (53%) women and 16 (47%) men. The mean age was 36 (19–71) years.
Results: Angiomyolipomas (AML) were present in 23 (68%) individuals. The lesions were unilateral in eight (35%) cases and bilateral in 15 (65%) cases. The median number of AML per patient was six. The median size of AML was less than 1 cm. There was a left predominance (55%) of AML in all segments of the kidney except in the superior third. 13 (38%) subjects had renal cysts. One (3%) subject had a renal cell carcinoma (RCC). Four (12%) subjects were symptomatic. There were two cases of hematuria from an AML, one case of hematuria from a hemorrhagic cyst in a subject without AML, and one case of flank pain and hemorrhage secondary to AML. Five (15%) subjects required intervention. One received angioembolization for a 6.5 cm AML. Four had nephrectomies, two for large AML (7 cm and unknown size), one for RCC, and one for polycystic kidney disease. Five (17%) subjects had chronic renal insufficiency.
Conclusions: Our series is the first to characterize the renal manifestations of a TSC population in Quebec. The renal manifestations are comparable to other populations studied. Further assessment is underway for other systems' involvement and genotype-phenotype correlations.

MP-04.19
Nodal density is the most important predictive factor of recurrence in a modern radical cystectomy cohort

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Introduction: Multiple factors have been attributed to bladder cancer recurrence post-cystectomy. The purpose of our study is to evaluate the natural history of post-cystectomy urothelial cell carcinoma (UCC) recurrence and to determine its predictive factors.
Methods: We evaluated 431 patients with a median age of 69.2 years who underwent radical cystectomy between 1995 and 2015 at a single academic institution.
Results: Previous non-muscle-invasive bladder cancer was observed in148 (34.34%) patients and 18 (4.2%) had previous upper tract UCC. 64 (14.9%) patients had a history of other malignancy and 24.4% presented with hydronephrosis. At the time of radical cystectomy (RC), an extended pelvic lymph node dissection (PLND) was performed for 104 (24.2%) patients, and 242 (56.2%) had a standard PLND. 94 (21.82%) patients were pN+, 31 (7.2%) had positive margins, 134 (31.1%) had lymphovascular invasion (LVI), and 69 (16.01%) had histological variants. In total, 116 (26.91%) patients had a recurrence as follows: pelvic (28.5%), retroperitoneum (62%), and distant (6%). 25% of patients recurred within six months, 38% within one year, 58% within three years, and 64% within five years. At last followup, 137 (31.9%) patients have died and 23% of those died of UCC. Median time to death was 6.6 years. Recurrence was associated with hydronephrosis at presentation, age <60 at the time of cystectomy, advanced clinical and pathological stage, LVI, histological variants, and node density. The median survival for patients with nodal density <25% was 6.8 years, which was statistically different when compared to nodal densities of 38% (1.5 years), 63% (0.9 years), and >75% (0.3 years).
Conclusions: In this modern cystectomy cohort, median time to recurrence was 2.5 years. Recurrence was associated with hydronephrosis at presentation, age <60 at the time of cystectomy, advanced clinical and pathological stage, LVI, histological variants, and node density.

Poster Session 5: Men's Health
June 25, 2017; 1600–1730

IPD-05.01

Cost analysis of Greenlight photoselective vaporization of the prostate compared to transurethral resection of the prostate for benign prostatic hyperplasia

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Study Groups: Boston Scientific Research Grant.

Introduction: Benign prostate hyperplasia (BPH) is a non-cancerous enlargement of the prostate gland, which results in the development of lower urinary tract symptoms that can negatively impact a patient's quality of life.[1] The gold standard treatment for moderate to severe BPH has been transurethral resection of the prostate (TURP); however, this procedure is associated with prolonged hospitalization and increased complications.[2] An alternative to TURP is Greenlight photoselective vaporization of the prostate (PVP), which is associated with better perioperative safety and reduced length of stay.[3,4] The objectives of the research were to 1) assess the cost of Greenlight PVP compared to Olympus Bipolar Power Button and TURP; and 2) assess the predictors of total cost.

Methods: A retrospective analysis was conducted of perioperative hospital costs of patients who underwent Greenlight PVP, TURP, or Olympus Bipolar Power Button from 2013–2015 at the Toronto Western Hospital. This study focused only on costs to the hospital. A multiple linear regression was performed to identify predictors of total cost. The variables included in regression analysis were patient age, type of procedure, inpatient procedure, Charlson Comorbidity Index, and distance to clinic.

Results: 203 patients received one of the three procedures over the study period. The total cost Greenlight PVP was $2875 per patient compared to $4633 for Olympus Power Button, and $4666 for TURP (Table 1). The linear regression showed that the Charlson Comorbidity score and inpatient procedure were independent predictors of total cost.

Conclusions: Greenlight PVP appears to be a superior economic option when compared to Olympus Power Button and TURP.

References:

1. Reich O, Gratzke C, Bachmann A, et al. Morbidity, mortality, and early outcome of transurethral resection of the prostate: A prospective multicentre evaluation of 10 654 patients. *J Urology* 2008;180:246-9. https://doi.org/10.1016/j.juro.2008.03.058
2. Bachmann A, Schurch L, Ruszat R, et al. Photoselective vaporization (PVP) vs. transurethral resection of the prostate (TURP): A prospective bi-centre study of perioperative morbidity and early functional outcome. *Eur Urol* 2005;48:965-71; discussion 972. https://doi.org/10.1016/j.eururo.2005.07.001
3. Stafinski T, Menon D, Harris K, et al. Photoselective vaporization of the prostate for the treatment of benign prostatic hyperplasia. *Can Urol Assoc J* 2008;2:124-34.
4. Whelan JP, Bowen JM, Burke N, et al. A prospective trial of GreenLight PVP (HPS120) vs. transurethral resection of the prostate in the treatment of lower urinary tract symptoms in Ontario, Canada. *Can Urol Assoc J* 2013;7:335-41. https://doi.org/10.5489/cuaj.180

IPD-05.01. Table 1. Mean total cost per patient per procedure for both inpatient and day surgery cases (n=203)

Variable	Mean (SD) ($)			Difference in cost*			
	Greenlight PVP n=56	Olympus power button n=29	TURP n=118	(Greenlight-TURP)	p	(Greenlight-Olympus power button)	p
Variable direct							
Labour	847.55 (284.66)	1766.73 (749.64)	1651.20 (635.08)	(803.65)	<0.01	(919.18)	<0.01
Supplies	634.85 (357.69)	721.93 (341.56)	778.87 (335.93)	(144.02)	0.01	(87.08)	0.28
Patient specific supplies	2.19 (8.87)	25.29 (88.10)	20.93 (50.01)	(18.74)	0.01	(23.10)	0.05
Other	1.36 (6.53)	11.46 (7.40)	10.56 (7.98)	(9.20)	<0.01	(10.10)	<0.01
Fixed direct							
Labour	144.83 (65.43)	319.44 (138.17)	319.10 (121.15)	(174.27)	<0.01	(174.61)	<0.01
Other	23.50 (8.05)	47.29 (17.80)	45.95 (16.70)	(22.45)	<0.01	(23.79)	<0.01
Building equipment	123.92 (62.41)	146.35 (56.92)	162.90 (49.40)	(38.98)	<0.01	(22.43)	0.11
Variable indirect	719.96 (246.00)	1108.21 (411.62)	1124.87 (349)	(404.91)	<0.01	(388.25)	<0.01
Fixed indirect	376.37 (157.04)	485.95 (172.62)	551.49 (152.50)	(175.12)	<0.01	(109.58)	<0.01
Total cost	**2874.53 (938.04)**	**4632.65 (1671.27)**	**4665.87 (1473.93)**	**(1791.34)**	<0.01	**(1758.12)**	<0.01

*Bracket indicates that Greenlight is less costly. Costs do not include cost of readmission. PVP: photoselective vaporization of the prostate; SD: standard deviation; TURP: transurethral resection of the prostate.

IPD-05.02

Surgical management of benign prostatic obstruction: 20-year population-level trends

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Study Groups: University of Toronto Research Program in Functional Urology.

Introduction: Benign prostatic obstruction (BPO) is highly prevalent among older men. Despite widespread use of medical therapy, surgical treatment remains a mainstay in BPO management. We characterized trends in BPO surgery in Ontario over a 20-year period.
Methods: We performed an interrupted time-series analysis using segmented regression among men aged ≥18 years undergoing BPO surgery between 1994 and 2014 in Ontario. The passage of time was the primary exposure. The primary outcome was the proportion of all BPO surgeries performed using each modality: transurethral resection of the prostate (TURP), endoscopic laser prostatectomy, open/laparoscopic prostatectomy, and others. Secondary outcomes included trends in the age and comorbidity of patients undergoing BPO surgery.
Results: We identified 136 459 men who underwent BPO surgery. The annual age-adjusted rate of BPO surgery declined significantly (24 per 10 000 population in 1995 to 10 per 10 000 population in 2014) over time. We identified two distinct epochs with respect to treatment modality. From 1994–2001, there were no significant changes in the distribution of BPO surgical modalities with TURP, the most common procedure throughout (97.2% in 1994 and 97.0% in 2001). In the period 2002–2014, there was a significant decline in the use of TURP (92.1% to 76.9%; p=0.027), with a corresponding increase in the use of endoscopic laser prostatectomy (3.5% to 21.9%; p=0.0008). We identified a small, but statistically significant increases in the age (p=0.0004) and comorbidity (p<0.0001) of patients over time.
Conclusions: This large, population-based study demonstrates a shift in the management of BPO, with increasing use of endoscopic laser prostatectomy beginning in 2002. However, TURP remains the most common treatment modality. We also identified shifting demographics of patients undergoing BPO surgery, with a trend for patients to be older and have greater comorbid disease at the time of surgery in more recent years.

IPD-05.03

One-year followup associations between testosterone replacement therapy and anthropometric measures, blood indices, liver enzymes, and diabetes mellitus control among late-onset hypogonadal men

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Study Groups: Hamad Medical Corporation Research Centre, protocol number 7117/07.

Introduction: Late-onset hypogonadism (LOH) affects middle-aged men with different signs and symptoms. In order to alleviate symptoms, testosterone-replacement treatment (TRT) is offered to suitable patients.

IPD-05.03. Table 1. Sample characteristics: hormones, anthropometric, biochemical, diabetes control, and prostate health indicators at baseline, 3, 6, and 12 months

Variables	Baseline Mean (SD)	3 months Mean (SD)	6 months Mean (SD)	12 months Mean (SD)	p
Hormones					
Testosterone (nmol/L)	7.62 (2.66)	15.32 (5.07)	16.91 (5.54)	17.61 (5.60)	<0.0001
Estradiol (pmol/L)	112.69 (46.38)	109.63 (43.78)	115.32 (41.08)	106.95 (40.12)	0.014
Anthropometric					
BMI (kg/m²)	34.627 (6.06)	—	34.24 (6.00)	33.76 (5.67)	<0.0001
WC (cm)	114.98 (12.63)	—	114.11 (12.77)	110.37 (19.03)	0.002
Biochemical					
Blood indices					
Hemoglobin (g/dL)	14.22 (1.31)	15.01 (1.34)	15.18 (1.39)	15.73 (3.12)	<0.0001
Hematocrit (%)	42.56 (3.34)	45.37 (3.73)	46.31 (4.16)	45.96 (5.24)	<0.0001
Serum lipid profile (mmol/L)					
Total cholesterol	5.00 (1.22)	4.73 (1.10)	4.62 (1.00)	4.37 (0.92)	<0.0001
HDL-C	1.01 (0.33)	1.06 (0.32)	1.09 (0.28)	1.18 (0.35)	<0.0001
Triglycerides	2.03 (0.97)	1.82 (0.81)	1.82 (0.77)	1.79 (0.91)	0.016
Liver enzymes (U/L)					
SGOT	28.63 (9.17)	30.04 (5.47)	27.37 (11.30)	28.02 (8.89)	0.821
SGPT	31.30 (10.06)	29.39 (10.54)	30.09 (11.70)	31.67 (10.40)	0.263
Diabetes mellitus control					
HbA1c (%)	8.06 (2.93)	7.35 (2.36)	7.22 (1.96)	6.92 (1.74)	<0.0001
Prostate health indicators					
Prostate volume (mL)	38.36 (16.11)	—	—	39.58 (16.48)	0.04
PSA (ng/mL)	1.54 (0.95)	1.73 (1.00)	1.84 (1.16)	1.92 (1.12)	<0.0001

BMI: body mass index; HbA1c: glycated hemoglobin; HDL-C: high-density lipoprotein cholesterol; SGOT: serum glutamic oxaloacetic transaminase; SGPT: serum glutamic pyruvic transaminase; PSA: prostate-specific antigen; WC: waist circumference; —: not measured.

Although TRT is commonly given to LOH patients, there remains uncertainty about the metabolic effects and/or adverse events during follow-ups. This study assessed the associations between TRT and wide range of characteristics that included hormonal, anthropometric, biochemical (blood, lipid profile, liver enzymes), diabetes control features, and prostate health indicators.

Methods: Study participants comprised LOH patients with ≤350 ng/dL serum testosterone (T) together with clinical symptoms. Patients received intramuscular 1000 mg testosterone undecanoate (TU) for one year. Patient anthropometric measurements were undertaken at baseline and at each visit, and blood samples were drawn at each visit, prior to the next TU injection, together with prostate examination. Consequently, all the main outcome measures were evaluated at baseline and every three months for one year (Table 1).

Results: 88 patients (mean age ± standard deviation [SD] 51.1 ± 13.0 years) completed the followup period. TRT was associated with significant increase in serum T levels and significant stepladder decrease in body mass index, white blood cell count, total cholesterol, triglycerides, and HbA1c from baseline values among all patients. There was no significant increase in liver enzymes. There was an increase in Hb and Hct, as well as in prostate-specific antigen and prostate volume, but no prostate biopsy intervention was needed for study patients during the one-year TRT followup.

Conclusions: TRT with long-acting TU improved the constituents of metabolic syndrome and improved HbA1c in a stepladder fashion, with no adverse effects.

IPD-05.04

Salvage of rapid ejaculation treatment failures using on-demand Promescent over-the-counter eutectic topical treatment

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Introduction: Treatment of refractory rapid ejaculation (RE) resulting in improved ejaculatory latency times confers a meaningful impact on quality of life (QoL). In Canada, short-acting selective serotonin reuptake inhibitors (SSRIs), such as paroxetine, are used off-label, as dapoxetine is not approved by Health Canada. Further options include couples therapy, behavioural modification, topical anesthetics, other oral off-label agents, and use of "seeded" condoms. Over-the-counter, internet-order-available Promescent, a novel delivery lidocaine spray, was assessed in this difficult-to-treat group, as select Canadian centres have anecdotally reported early successes.

Methods: Promescent, a lidocaine-only eutectic formulation enabling absorption through the skin (U.S. patents 8507561/8563616) was used in 30 consecutive men for refractory RE. Two or more modalities had been used over a minimum of two years, and patients were evaluated for RE treatment failure. The goal was to determine "real-life" success, as defined by patient/partner satisfaction and continued use.

Results: 17 of 30 men are using Promescent at six months, with an initial response rate of 22/30. Four couples ceased use due to partner or patient medication odour intolerance. One patient is without a partner, but continues to use with self-stimulation. 13/17 are in heterosexual relationships, 4/17 MSM. There has been no report of diminution of treatment effect after six months in the 17/30 group. Eight of 30 found no improvement or judged improvement insufficient to continue treatment.

Conclusions: In men with refractory RE, we were surprised to observe Promescent offers a greater than 50% opportunity for meaningful improvement in sexual function, as evidenced by continued usage at six months in this difficult-to-treat cohort. Promescent appears to be a safe and effective option for these men. Partner acceptance of treatment is high, with minimal side effect-induced termination of treatment.

Acknowledgements: The investigator is not affiliated, nor has accepted any funding from Absorption LLC.

MP-05.01

The concordance of preoperative core testis needle biopsies with surgical diagnoses among azoospermic infertile men

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Introduction: Among men with azoospermia, establishing a clinical and/or histological diagnosis (obstructive [OA], non-obstructive [NOA]) is essential for patient counselling, prognostication, operative planning, and offering strategies for sperm retrieval. The current initiative establishes the safety, utility, and surgical diagnostic accuracy of a preoperative core needle testis biopsy among azoospermic men.

Methods: Between 2000 and 2014, azoospermic men with diagnostic uncertainty (OA vs. NOA) following clinical evaluation (history, physical exam, laboratory testing, and diagnostic imaging) were offered a core needle testis biopsy under local anesthetic. A single testis biopsy tissue core preserved in Bouin's fixative was evaluated by an experienced reproductive pathologist. Biopsy specimens were classified as active spermatogenesis, hypospermatogenesis, maturation arrest, or Sertoli cell only. Among patients electing for surgery, the concordance of the core biopsy findings were compared with operative diagnostic findings. Biopsy tissue specimen quality, complications, and clinic predictors of testis histology were analyzed.

Results: Among 367 core testis needle biopsies, 97% yielded tissue of adequate quality for histological interpretation. 134 men subsequently underwent surgical intervention (reconstruction, microTESE). Of these men, the concordance of the needle biopsy diagnosis with surgical findings was 98.4% (63/64 patients) among men with OA (active spermatogenesis on biopsy) and 100% (52/52 patients) among men with NOA (Sertoli cell only, maturation arrest). Patients with a biopsy diagnosis of hypospermatogenesis (n=18) were equally classified as OA and NOA. Biopsy-related complications included two hematomas and one case of epididymitis.

Conclusions: Core needle testis biopsy to resolve diagnostic uncertainty among azoospermic men is well-tolerated and yields adequate tissue samples for histological classification that is highly concordant with intraoperative diagnoses.

MP-05.02

Complications and functional outcomes of high-risk patient with cardiovascular disease necessitating anticoagulation therapy treated with the 532 nm laser photovaporization Greenlight XPS 180 W

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Introduction: According to American Urological Association (AUA) guidelines, Greenlight PVP 532 nm laser vaporization of the prostate should be considered in patients receiving anticoagulant medication or with a high cardiovascular risk. We sought to examine the functional and complications outcomes of high-risk patients with cardiovascular disease necessitating maintenance of anticoagulation therapy (ACO).

Methods: A retrospective analysis of prospectively maintained institutional database was performed. Men were stratified according to ACO treatment status, defined as the usage of anti-vitamin K, heparin, direct thrombin inhibitor, and/or anti-Xa. Complications at 30 and 90 days according to Clavien classification and functional outcomes (International Prostate Symptom Score [IPSS], peak flow rate [Qmax], and post-void residual [PVR]) were analyzed up to five-years' followup.

Results: A total of 39 (10%) patients were on ACO, including eight patients with prosthetic cardiac valve, 26 patients with malignant arrhythmias, and 27 with coronary cardiac disease. ACO patients were older (75 vs. 67 years; $p<0.01$) and with more systemic disease defined by American Society of Anesthesiologists (ASA) score. Men with ACO were more likely to fail first trial of void, had significant longer catheterization time (1.7 vs.1 day) and longer hospitalization (2.5 vs. 0.5 days), respectively ($p<0.01$ for all). ACO men also had a higher 30-day readmission rate of

MP-05.02. Table 1. Baseline and perioperative characteristics, as well as complications for study patients

Variables	No ACO (n=365)	ACO (n=39)	p
Baseline characteristics			
Age			<0.001
Mean (median)	67 (67)	75 (77)	
IQR	61–74	69–81	
ASA score			<0.001
1	102 (27.9)	1 (2.6)	
2	208 (57.0)	12 (30.8)	
3–4	55 (15.1)	26 (66.7)	
Indwelling catheter			0.5
No	224 (61.4)	21 (53.8)	
Yes	141 (38.6)	18 (46.2)	
Perioperative characteristics			
Hospital length of stay (days)			<0.001
Mean (median)	0.5 (0)	2.5 (1)	
IQR	0–1	1–2	
Foley removal (days)			<0.001
Mean (median)	1 (1)	1.7 (1)	
IQR	1–1	1–2	
Bleeding	1 (0.3)	0 (0.0)	0.2
Transfusion	1 (0.3)	1 (2.6)	0.5
Complications			
30-day admission rate	18 (4.9)	6 (15.4)	0.03
Hematuria			
Clavien I	33 (9.0)	12 (30.8)	<0.001
Clavien II	2 (0.5)	0 (0)	0.5
Clavien III	0 (0)	1 (2.6)	0.2
Retreatment rates at 24 months	4 (1.1)	1 (2.6)	1

ACO: anticoagulation therapy; ASA: American Society of Anesthesiologists; IQR: interquartile range.

16% and higher rate of hematuria observed in almost 1/3 of the cases. Functional outcomes were significantly improved and equivalent to non-ACO patients at all endpoints, including at five-year followup (Table 1).
Conclusions: This is the first study to look at safety and functional outcomes of patients with cardiovascular disease requiring ACO with five years' followup. PVP provides significant and durable treatment for symptomatic benign prostatic hyperplasia (BPH) in these high-risk ACO patients; however, treatment comes with an increased risk of bleeding-related complications, implying longer catheterization and hospitalization that should be discussed during preoperative patient counselling.

MP-05.03
Greenlight XPS 180W laser photovaporization of the prostate: Five-year experience and outcomes

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Introduction: While photoselective vaporization of the prostate (PVP) has gained widespread acceptance as an option of benign prostatic hyperplasia (BPH) treatment, long-term durability outcomes is still lacking. Herein, is the first five-year long-term report on BPH treatment with Greenlight XPS-180W.
Methods: A retrospective analysis was conducted on a prospectively gathered database of 424 consecutive patients who underwent PVP using Greenlight XPS-180W laser system (AMS, Minnetonka, MI, U.S.) performed by a single experienced laser surgeon between 2011 and 2016. Preoperative characteristics, intervention parameters, and postoperative functional outcomes, as well as Clavien-Dindo complications are analyzed up to five years followup.
Results: Among 424 men, 370 remained eligible for analysis after excluding prostate cancer patients and selecting patients operated exclusively by Greenlight XPS-180W laser system. Mean prostate volume was 74.84 cc (95% confidence interval [CI] 70.96; 78.72). Mean energy in KJ, operative time, and energy/g in Kj/g were 268k J (253.79; 282.84), 62 minutes (59.21; 65.16), and 3.7 kJ/cc (3.59; 3.86), respectively. Prostate-specific antiogen (PSA) as surrogate marker for adenoma removal reached nadir at one year, with a 67% reduction. All functional parameters were significantly improved at all endpoints, including at five years compared to preoperative values (Table 1). At five-year followup, International Prostate Symptom Score (IPSS), quality of life, maximal volume of urinary flow (Qmax), and post-void residual improved by 75.17% (19.68), 78.72% (3.70), 66.15% (10.75), and 81.59% (281.5), respectively. The most common complication observed is Clavien II overactive bladder seen in 20% of case at three months, but this decreased to 10% after one year (Table 2). De novo stress urinary incontinence was present in 5% of the patients at three months. Overall retreatment for symptomatic adenoma regrowth was observed in less than 1% of the cohort (4/424).
Conclusions: Greenlight XPS-180W laser system with a systematic surgical approach is safe, efficacious, and provides durable treatment for the treatment of benign prostatic obstruction secondary to BPH, with <1% retreatment at five years.

Reference:

1. Hueber PA, Bienz MN, Valdivieso R, et al. Photoselective vaporization of the prostate for benign prostatic hyperplasia using the 180 Watt system: Multicentre study of the impact of prostate size on safety and outcomes. *J Urol* 2015;194:462-9. https://doi.org/10.1016/j.juro.2015.03.113

MP-05.03. Table 1. Five-year functional outcomes

Outcomes	Baseline	Followup (months)							p	p
		3	6	12	24	36	48	60		
PSA	6.22	NA	2.26	2.03	2.60	2.41	2.77	4.89	<0.001	0.854
IPSS	26.18	7.68	6.08	5.76	5.42	5.12	6.23	6.50	<0.001	<0.001
QOL	4.70	1.33	1.02	0.96	0.95	0.81	0.97	1.00	<0.001	<0.001
Qmax	5.50	19.93	20.17	19.81	19.78	19.50	19.28	16.25	<0.001	0.135
PVR	345	45.14	38.89	44.30	44.23	40.41	32.80	63.50	<0.001	0.727

IPSS: International Prostate Symptom Score; PSA: prostate-specific antigen; PVR: post-void residual; Qmax: maximum urinary flow; QOL: quality of life.

MP-05.03. Tables 2. Complications

Months (n=patients)	3 (336)	6 (221)	12(189)	24 (144)	36 (89)	48 (42)
OAB % (n)	18.75 (63)	13.12 (29)	8.46 (16)	6.94 (10)	7.86 (7)	9.52 (4)
SUI % (n)	5.05 (17)	1.8 (4)	3.17 (6)	1.38 (2)	2.24 (2)	4.76 (2)
Dysuria % (n)	4.16 (14)	1.8 (4)	1.58 (3)	0.69 (1)	4.49 (4)	-
UTI % (n)	2.38 (8)	1.35 (3)	1.05 (2)	0	0	-
Refractory retention % (n)	1.48 (5)	1.35 (3)	0.52 (1)	2.77 (4)	1.12 (1)	-
Hematuria % (n)	1.78 (6)	0.9 (2)	0.52 (1)	2.77 (4)	2.24 (2)	-
Urethral stricture % (n)		0.45 (1)	1.05 (2)			-
Erectile dysfunction % (n)	0.29 (1)	0.9 (2)	1.58 (3)	4.16 (6)	4.49 (4)	2.38 (1)
Bladder neck contracture % (n)	0.29 (1)	0.45 (1)	2.64 (5)	-	-	-
Redo BPH surgery % (n)	-	-	0.52 (1)	0.69 (1)	-	4.76 (2)

BPH: benign prostatic hyperplasia; OAB: overactive bladder; SUI: stress urinary incontinence; UTI: urinary tract infection.

MP-05.04

The use of clomiphene citrate for idiopathic male infertility: A prospective study on its efficacy

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Introduction: Clomiphene, or clomiphene citrate, is a selective estrogen blocker used off-label for the management of idiopathic male infertility. It indirectly stimulates the secretion of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) by centrally blocking estrogen receptors;[1] however, to date, existing reviews and studies have failed to provide clear evidence on its efficacy on spermatogenesis and pregnancy outcomes.

Methods: A prospective study was performed at the McGill University Reproductive Centre between 2011 and 2014. Inclusion criteria included men more than 18 years of age with oligoasthenoteratozoospermia or non-obstructive azoospermia. They received 25 mg of clomiphene citrate orally once a day. Significant female fertility factors were excluded. Sperm analysis and hormonal profile were performed at baseline and at six months. Pregnancy outcomes were measured throughout the study.

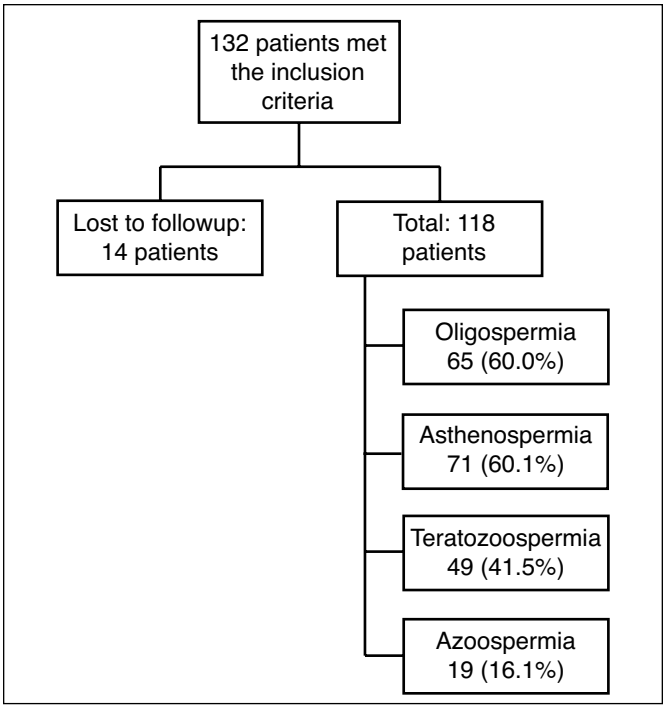

Fig. 1. MP-05.04. Abnormal findings on sperm analysis.

MP-05.04. Table 1. Sperm analysis and hormonal profile at baseline and at 6 months

	Baseline	6 months	p
Testosterone (umol/L ± SD)	11.4 ± 3.5	17.0 ± 7.1	<0.05
FSH (IU/L ± SD)	10.0 ± 12.7	11.9 ±11.1	<0.05
LH (IU/L ± SD)	5.5 ± 2.5	7.9 ± 4.9	<0.05
Sperm concentration (millions/ml ± SD)	21.6 ± 33.7	21.2 ± 32.1	0.79

FSH: follicle-stimulating hormone; LH: luteinizing hormone; SD: standard deviation.

Results: A total of 132 patients were recruited, of whom 118 completed the study. Median age was 34 years old. There were no adverse effects reported. The abnormal findings on sperm analysis are listed in Fig. 1. A significant increase testosterone, LH, and FSH was observed after clomiphene administration (Table 1). The sperm concentration remained stable. 36 patients increased their semen concentration by more than 30% (30.5%). The pregnancy rate at six months was 17.8% (21 patients). Within the patients who achieved pregnancy during the study, 12 increased their semen concentration by more than 30%.

Conclusions: Although clomiphene citrate is an attractive empiric medical therapy for the management of idiopathic male infertility because of its safety, its efficacy on spermatogenesis and pregnancy outcomes were limited in this study. The pregnancy rate observed in this study is comparable to untreated series of infertile couples. Given the lack of strong evidence on spermatogenesis and subsequent pregnancy, we do not recommend clomiphene citrate in couples that need to achieve pregnancy within a short delay.

Reference:

1. Rodriguez KM, Pastuszak AW, Lipshultz LI. Enclomiphene citrate for the treatment of secondary male hypogonadism. *Expert Opin Pharmacother* 2016;17:1561-7. https://doi.org/10.1080/14656566.2016.1204294

MP-05.05

DNA fragmentation associated with cryopreservation of human testicular sperm

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Introduction: Although ejaculated sperm is the most common source of sperm for cryopreservation, for patients with poor ejaculated sperm, azoospermia, or those who will undergo surgery in the testis, testicular sperm may also be cryopreserved. With the latest development in the assessment in sperm chromatin structure, sperm quality can now be assessed at the

molecular level. Our objective was to evaluate the impact of testicular sperm cryopreservation on chromatin quality in various groups of patients.
Methods: 27 patients were subdivided in four groups: control, varicocele, obstructive azoospermia, and abnormal sperm chromatin structure in ejaculated sperm. Testicular tissues were obtained using either a needle or open biopsy technique. Terminal deoxynucleotidyl transferase dUTP Nick-End Labeling (TUNEL) assay was used to quantify DNA fragmentation. Samples were evaluated both fresh and after cryopreservation for a minimum of one week.
Results: Fresh testicular sperm had a mean DNA fragmentation of 28.4% (standard deviation [SD] 12.1%) increase to 46.0% (SD 15.6%) following cryopreservation ($p<0.001$). Control patients (n=3) did not achieve significant changes in mean DNA fragmentation ($p=0.15$). Varicocele (n=6) (26.6% vs. 40.7%; $p<0.02$), obstructive (n=9) (24.7% vs. 43.0%; $p<0.01$) and patients with high DNA fragmentation in ejaculated sperm (n=9) (33.6% vs. 57.3%; $p<0.01$) reached statistical significance.
Conclusions: To our knowledge, this is the first study to evaluate the impact of cryopreservation of testicular sperm on the sperm chromatin quality in various defined categories of patients. It appears that cryopreservation may have a larger effect on chromatin integrity in patients with obstructive azoospermia or high DNA fragmentation in ejaculated sperm compared to those with varicoceles or otherwise normal testicles. Further studies are required to confirm our preliminary findings and to evaluate the impact on reproductive outcomes within these populations.

MP-05.06

Optimizing patient outcomes for intracavernous injection therapy (ICI): Lessons learned from 1912 penile injections performed over 12 months in 2015–2016

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Introduction: Intracavernous injection (ICI) therapy success is often dependent on healthcare provider (HCP) factors. Success in the office should be followed by success at home, yet a significant number of men present for evaluation of ICI failure (especially post-radical prostatectomy [RP]) in our subspecialty erectile dysfunction [ED]/Peyronie's disease practice. Team-based care under surgeon and registered practical nurse (RPN) allows daily volumes of four consult/cavernous injection and stimulation (CIS) tests, 12 CIS tests, and 4–6 ICI teaches (based on CIS test Erection Hardness Score [EHS] 4 or DS Trimix 1 cc test giving maximum usable response). We present keys for optimizing ICI success.
Methods: A total of 1912 injections (CIS/ICI) were performed over 12 months. Among this group, 36 patients were referred specifically for failed ICI and penile implant surgery assessment due to failed treatment.
Results: 29/36 were salvaged to ICI success. Lack of rigorous CIS testing to an EHS score of 4 before prescriptions given was common, resulting in no successful intercourse events (19/36). 21/36 were not taught to a standard ensuring success (detailed teaching, EHS 4 or maximum dose [allowing an usable EHS 3]). Average number of visits, including consult for satisfactory self-ICI, was 4.1, which compares to 3.4 in 2014–2015 at the University-based clinic the year prior. Rigorous self-reporting using an EHS-based 'report card' at 15 minutes post-injection, one hour, and time of detumescence for each test (including EHS rigidity) has improved our precision in delivering ICI care by fine-tuning dosing in the office for next test or teach visits.
Conclusions: ICI is safe and robust for many men, especially early after prostate cancer surgery and for men with PDE-5-refractory ED. Suboptimal structure and execution of an ICI program defeats success. 81% of ICI treatment failures were primarily HCP-related. From the patient's viewpoint, seeing a full erection sufficient for penetration is encouraging, and in-office teaching to this level instills confidence for at-home use.

MP-05.07

The effectiveness of hemi-transurethral resection of prostate in treatment of very large benign prostatic hyperplasia

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Introduction: Transurethral resection of prostate (TURP) is the gold standard surgical technique for treatment of symptomatic benign prostatic hyperplasia (BPH); however, large and vascular prostate may represent a surgical challenge both in open, as well as in endoscopic resection. We assessed the role ohemi-TURP (H-TURP) as an alternative technique to the standard complete endoscopic resection or open prostatectomy.
Methods: We retrospectively studied patients with enlarged prostate who underwent H-TURP over a period of five years. The H-TURP was performed on patients for either high comorbidity, intraoperative severe bleeding, or to reduce the resection time. Prostate resection was carried out using monopolar diathermy in all. We compared the results of preoperative International Prostate Symptom Score (IPSS), quality of life (QoL), flow test (Qmax), prostate-specific antigen (PSA), and urea and electrolytes (U&E) to those obtained after treatment.
Results: A total of 37 patients underwent H-TURP. The mean age was 72.5 years. 16 of those patients had H-TURP for acute urinary retention and 21 for bothersome lower urinary tract symptoms that failed initial pharmacotherapy. No episodes of TURP syndrome were noted and no patients required blood transfusion. Patients had an average of 44.8 months postoperative followup. The mean IPSS reduction was 52% and QoL score came down from average of 3.5 to 1 postoperatively. The mean Qmax improved from an average of 9.9 to 19.4 ml/sec (95% improvement rate).The PSA was reduced 48.7% after H-TURP. Only two patients required further resection (5.4%).
Conclusions: H-TURP appears to have comparable results to European Association of Urology (EAU) published data of gold standard TURP and open prostatectomy. The H-TURP offered clear, objective, and subjective improvements, with a low complication rate and may be suitable for patients with a very large and vascular prostate.
References:

1. Madersbacher S, Marberger M. Is transurethral resection of the prostate still justified? *Br J Urol* 1999;83:227-37. https://doi.org/10.1046/j.1464-410x.1999.00908.x
2. Varkarakis J, Bartsch G, Horninger W. Long-term morbidity and mortality of transurethral prostatectomy: A 10-year followup. *Prostate* 2004;58:248-51. https://doi.org/10.1002/pros.10339
3. Rassweiler J, Teber D, Kuntz R, et al. Complications of transurethral resection of the prostate (TURP), incidence, management, and prevention. *Eur Urol* 2006;50:969-79. https://doi.org/10.1016/j.eururo.2005.12.042
4. Varkarakis I, Kyriakakis Z, Delis A, et al. Long-term results of open transvesical prostatectomy from a contemporary series of patients. *Urology* 2004;64:306-10. https://doi.org/10.1016/j.urology.2004.03.033
5. Skolarikos A, Papachristou C, Athanasiadis G, et al. Eighteen-month results of a randomized, prospective study comparing transurethral photoselective vaporisation with transvesical open enucleation for prostatic adenomas greater than 80 cc. *J Endourol* 2008;22:2333-40. https://doi.org/10.1089/end.2008.9709
6. Kuntz RM, Lehrich K, Ahyai SA. Holmium laser enucleation of the prostate vs. open prostatectomy for prostates greater than 100 grams: Five-year followup results of a randomized clinical trial. *Eur Urol* 2008;53:160-6. https://doi.org/10.1016/j.eururo.2007.08.036
7. Gratzke C, Schlenker B, Seitz M, et al. Complications and early postoperative outcome after open prostatectomy in patients with benign prostatic enlargement: Results of a prospective, multicentre study. *J Urol* 2007;177:1419-22. https://doi.org/10.1016/j.juro.2006.11.062

MP-05.08

The temporary implantable nitinol device (iTind) for the minimally invasive treatment of benign prostatic hyperplasia: Comparison of three-year outcomes and cost in Canada

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Introduction: The iTind (Medi-Tate Ltd.) device, comprised of three nitinol struts and an anchoring leaflet, is deployed in the prostatic urethra where it expands, resulting in ischemic incisions and a reshaping of the bladder neck and prostate. The device is implanted in five minutes using a rigid cystoscope. After five days, it is removed through a 22 French catheter. The device is Health Canada-approved. Three-year clinical outcomes and economic comparisons are made to the prostatic urethral lift (PUL) system (UroLift – NeoTract Inc.).

Methods: A one-arm, single-centre, prospective study of the iTind in 32 men was conducted (one-yearr results).[1] Similarly, the L.I.F.T. study, a multicentre, sham-controlled, prospective study with similar inclusion criteria and outcomes examining the PUL has published its three-year results.[2]

Results: At baseline, patient's mean (standard deviation [SD]) total prostate volume (TPV), International Prostate Symptom Score (IPSS), quality of life (QoL), and peak flow rate (Qmax) were 29.5 (+7.4), 19 (14–23), 3 (3–4), and 7.6 (2.2) ml/second, respectively. After 36 months, IPSS score, QoL, and Qmax were 12 (6–24), 2 (1–4) and 13 ml/second, respectively. Only one patient (3.1%) required transurethral resection of the prostate (TURP). By comparison, the PUL study baseline patient's mean (SD) TPV, IPSS, QoL, and Qmax were 44.5 (+12.47), 22.3 (13–35), 4.6 (4.4–4.8), and 7.9 (3–13) ml/second, respectively. After 36 months, IPSS, QoL, and Qmax were 12.7 (11–14), 2.2 (1.9–2.6), and 11.8 (10.6–13) ml/second, respectively. The iTind resulted in superior Qmax (p=0.033) and similar IPSS (p=0.098) and QoL (p=0.192) improvements compared to PUL implant at three years. In Canada, the iTind device cost is approximately $2500 CAD and one device is used per case. The approximate cost of a PUL implant is $800 CAD/implant and the mean number of PUL implants used in the L.I.F.T. study was 5.2. Thus in Canada, the approximate cost per PUL procedure will be $4160 CAD.

Conclusions: The iTind demonstrates equivalent or superior three-year outcomes compared to the UroLift and is a lower cost option in Canada.

References:
1. Porpiglia F, Fiori C, Bertolo R, et al. Temporary implantable nitinol device (TIND): A novel, minimally invasive treatment for relief of lower urinary tract symptoms (LUTS) related to benign prostatic hyperplasia (BPH): Feasibility, safety and functional results at one year of followup. *BJU Int* 2015;116:278-87. https://doi.org/10.1111/bju.12982
2. Roehrborn C, Rukstalis D, Barkin J, et al. Three-year results of the prostatic urethral L.I.F.T. study. *Can J Urol* 2015;22:7772-82.

MP-05.09

Monopolar, bipolar, and GreenLight laser photovaporization prostate resections: A retrospective comparison of the rate of complications

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Introduction: Monopolar transurethral resection of the prostate (M-TURP) has been the gold standard for surgical treatment of benign prostatic hyperplasia. In recent years, the use of bipolar plasma TURP (B-TURP) and photoselective GreenLight laser vaporization of the prostate (PVP) have grown in popularity to reduce complication rates and hospital length of stay (LOS). The aim of this study was to compare the perioperative and one-year complication rates between all three technologies at a single centre.

Methods: 284 men were identified as having undergone M-TURP, B-TURP, or PVP for any reason at our centre between 2013 and 2016. All patients were at least one year post-surgery. Data was collected from hospital records and office charts. Perioperative complications, LOS, anticoagulation use, and complications up to one year postoperatively were analyzed. The study was approved by our hospital ethics review board.

Results: Of the 284 patients, 114 had M-TURP, 99 had PVP, and 71 had B-TURP (mean age 71.7 years, range 49–92). The most common reason to undergo M-TURP was urinary retention (46.5%), while the most common reason to undergo B- TURP or PVP was failed medical management of lower urinary tract symptoms (43.7% and 34.3%, respectively). There was a statistically significant difference between groups regarding LOS (M-TURP 70.2%, three days; B-TURP 60.6%, two days; PVP 78.6%, same-day discharge; p<0.000001). There was no statistical difference between groups regarding age, intraoperative complications, postoperative complications, blood transfusions, TURP syndrome, readmission rates, urinary tract infections, bladder neck contractures, or urinary retention after surgery.

Conclusions: These results demonstrate that M-TURP and B-TURP are associated with longer hospital stays, while the majority of patients undergoing PVP can be discharged same day. All groups appear to have similar rates of intraoperative and postoperative complications up to one year after surgery.

MP-05.10

Single-incision vasectomy reversal: Less pain without compromising surgical outcomes

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Introduction: The single-incision vasectomy reversal (SIVR) offers an innovative approach to vasectomy reversal (VR) by which the entire procedure is performed through a single midline mini-incision. Much like the no-scalpel vasectomy (NSV), the SIVR was designed with the goal to minimize surgical dissection and reduce morbidity following VR. The current report highlights fertility and functional outcomes following SIVR compared to a bilateral-incision VR (BIVR).

Methods: A prospective VR database was used to identify consecutive cases of primary bilateral vasovasostomy VRs. Cases were stratified into SIVR or BIVR. Baseline patient characteristics, measures of pain and functional recovery, and postoperative patency outcomes were compared between the two groups. NSV patients served as controls for the assessment of postoperative pain and recovery. Pain and functional recovery after surgery were evaluated using a previously validated 10-point pain scale adapted to VR.

Results: Of 1225 consecutive VRs performed by a single surgeon, 135 consecutive cases of SIVR and 200 cases of BIVR (n=325 total) were identified. Baseline patient characteristics, postoperative patency, and semen parameters are summarized in Table 1. Compared to a BIVR, patients who had a SIVR reported significantly less pain immediately following surgery and during the first week of recovery (Fig. 1). SIVR patients reported quicker complete pain resolution, required pain medication for a shorter duration of time, and returned to work faster than patients undergoing a

MP-05.10 Table 1. Baseline patient characteristics, postoperative patency, and semen parameters

Factor	SIVR	BIVR	WHO SA parameters	p
Age	38	41		NS
Occlusion intervals (years)	5.5	7.8		<0.05
Patency (%)	94	93		NS
Sperm concentration (millions/ml)	31	31	>15	NS
Motile sperm (%)	49	57	32	NS
Normal morphology (%)	46	64	4	<0.05
Total motile sperm count (x 10^6)	46	62		NS

BIVR: bilateral incision vasectomy reversal; NS: non-significant; SA: semen analysis; SIVR: single-incision vasectomy reversal; WHO: World Health Organization.

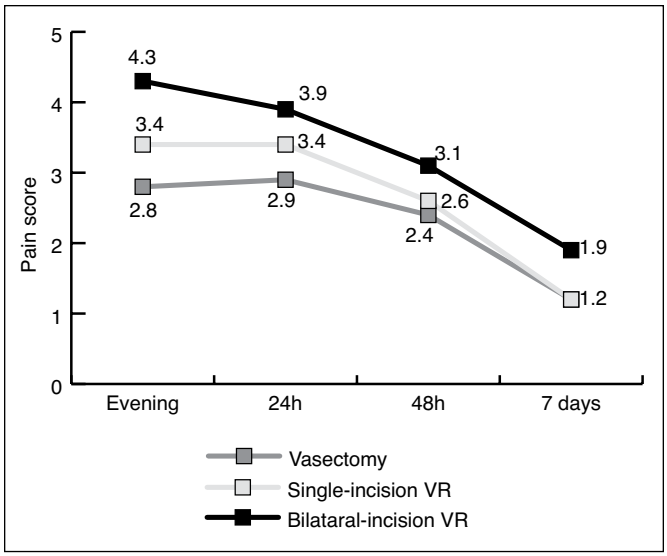

Fig. 1. MP-05.10. Postoperative pain measures. VR: vasectomy reversal.

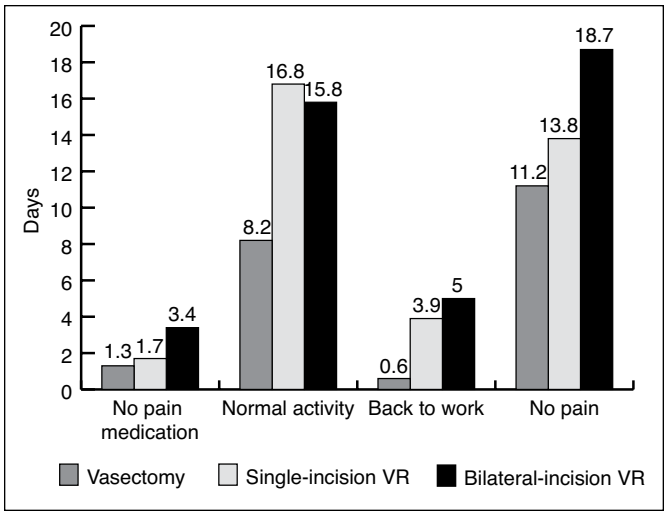

Fig. 2. MP-05.10. Patient-reported outcomes of single-incision vasectomy reversal (SIVR) vs. bilateral-incision vasectomy reversal (BIVR).

BIVR (Fig. 2). Recovery patterns following a SIVR were similar to patients recovering from a NSV.
Conclusions: A SIVR is feasible option in well-selected men undergoing vasovasostomy without compromising patency rates or semen parameters. Minimizing the number and size of the incisions and the degree of surgical dissection appears to translate into less postoperative discomfort and quicker functional recovery.

MP-05.11

Multicentre international experience of 180 W LBO laser photovaporization in men with very large prostates (prostate volume >200 cc)

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Introduction: According to European Association of Urology (EAU) and American Urological Association (AUA) guidelines on management of male non-neurogenic lower urinary tract symptoms (LUTS), photoselective vaporization of the prostate with GreenLight XPS (PVP XPS) is superior to transurethral resection of the prostate (TURP) with regard to intraoperative safety and postoperative complication rates, such as bleeding. The experience of the GreenLight system with very large glands (>200 mL) is very limited. In the present study, we aimed to describe perioperative results, as well as functional outcomes and complications of photo-vaporization of prostate glands bigger than 200 cc using the GreenLight system.
Methods: Retrospective analysis of prospectively maintained, multicentre database was performed to select a subgroup of men having very large prostates (>200 mL) treated with the Greenlight XPS laser using PVP for the treatment of symptomatic benign prostatic hyperplasia (BPH). International Prostate Symptom Score (IPSS), peak flow rate (Qmax), post-void residual (PVR), and prostate-specific antigen (PSA) were measured at six, 12, 24, 36, and 48 months. Durability was evaluated using BPH retreatment rate at 12, 24, and 36 months. Additionally, complications were recorded using the Clavien-Dindo classification.
Results: A total of 38 (9%) men had prostates larger than 200 mL. Men with very large prostates were older (76 vs. 72 years; p=0.05), had higher PSA levels (9.9 vs. 6.2 ng/dL; p=0.005), and had more indwelling catheters (55.6 vs. 41.3; p=0.001). Patients with very large prostates had longer operating room (OR) lasing times (94 vs. 52 minutes), less energy density delivered (2.8 vs. 3.4 kJ/mL), and longer time to removal of catheter (48 vs. 24 hours). In terms of complications, men with very large prostates had more LUTS at six months and the retreatment rates were the same at two years (4.9 vs. 5%). Finally, functional outcomes were similar; however, very large prostates had a smaller PSA drop in comparison (28 vs. 50%).
Conclusions: PVP Greenlight XPS 180 W is an acceptable technique for very large prostates (>200 mL). However, OR times, energy density delivery, PSA drop at two years of followup, catheterization time, and LUTS are a concern in this particular subgroup. This should be used for patient counselling and surgery planning.

MP-05.12

How long should patients wait before resuming sexual activity after benign prostatic hyperplasia surgery?

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Introduction: Surgical therapy for benign prostatic hyperplasia (BPH) is among the most common urological procedures. While most patients are expected to resume sexual activity postoperatively, data pertaining to the required time of abstinence is lacking.
Methods: Following IRB approval, we prospectively enrolled sexually active men referred for BPH surgery in a questionnaire-based study. Patients were asked to complete an International Prostate Symptom Score (IPSS), International Index of Erectile Function (IIEF), and the sexual part of the Expanded Prostate Cancer Index Composite (EPIC) questionnaires (assessing BPH severity, erectile and sexual function) a month before and after their surgery. Upon discharge, patients were advised to resume sexual activity whenever they desired without indicating a specific period of abstinence. To study urologists' perspectives in this context, we approached board-certified urologists, asking them to complete a questionnaire assessing their current practice and recommendations.
Results: Of the 71 participating patients, roughly half underwent endoscopic surgery (Table 1). The postoperative IPSS improved significantly, while no difference was detected in the IIEF and EPIC scores. Almost all patients (94%) reported resuming sexual activity less than a month postoperatively and more than 40% within two weeks. Two-thirds reported on retrograde ejaculation and 11 % reported on mild bleeding. Although more than 20% experienced some pain during orgasm, only 10% decided to refrain temporarily from further sexual activity. Overall, 70 urologists completed the questionnaire (Table 2). More than 94% worked at academic centres, and over 50% indicated performing at least 60 surgeries

MP-05.12. Table 1. Patient demographic, clinical, and preoperative/postoperative questionnaire scores

Variable	Value
Number of patients per age groups (%)	
≤49 years	1 (1.3%)
50–59	12 (15.4%)
60–69	46 (59%)
70–79	19 (24.3%)
Total	78 (100%)
Mean age (SD)	65.3 (6.4)
Marital status (%)	
Married	72 (92.3%)
Divorced	4 (5.1%)
Widower	2 (2.6%)
Mean age-adjusted Charlson score (SD)	2.6 (1.4)
Preoperative medication use (%)	
Alpha blockers	71 (91%)
5-alpha reductase inhibitors	15 (19.2%)
Phosphodiesterase type 5 inhibitors	7 (9%)
Anticholinergics	6 (7.7%)
Reason for surgery (%)	
Indwelling catheter	27 (34.6%)
Hematuria	5 (6.4%)
Recurrent UTI	3 (3.8%)
Acute renal failure	7 (9%)
Bladder stones	8 (10.3%)
Failed medical therapy	28 (35.9%)
Preoperative mean PSA (SD)	4.9 (4.6)
Mean preoperative prostate size (cc) (SD)	90.5 (56.9)
Mean preoperative creatinine (mg/dl) (SD)	1.1 (0.33)
Type of surgery (%) with mean surgery time (min), (SD)	
Endoscopic	35 (49.3%), 48.6 min (15.9)
Open	36 (50.7%), 99 min (13.4)

	Endoscopic surgery	Open surgery	Total
Resuming sexual activity postoperatively			
No return to any sexual activity	0%	11.1%	5.7%
Resuming sexual activity 3–7 days postoperatively	8.8%	2.8%	5.7%
Resuming sexual activity 7–14 days postoperatively	29.4%	41.7%	35.7%
Resuming sexual activity 14–30 days postoperatively	61.8%	44.4%	52.9%

	30 days preoperatively	30 days postoperatively	p
Mean IPSS score (range 0–35)	23.34 (7.23)	7.37 (5.42)	<0.001
Mean IIEF score (range 1–30)	21.27 (8.7)	21.37 (8.6)	0.898
Mean EPIC score (range 0–100)	62.9 (20.9)	64.5 (21)	0.39

EPIC: Expanded Prostate Cancer Index Composite; IIEF: International Index of Erectile Function; IPSS: International Prostate Symptom Score; PSA: prostate-specific antigen; SD: standard deviation; UTI: urinary tract infection.

yearly. More than 50% would recommend abstaining from any sexual activity for at least one month postoperatively.

Conclusions: While most urologists recommend refraining from sexual activity for at least one month following BPH surgery, our study suggests that over 94% of patients may resume sexual activity less than a month postoperatively, with minimal adverse effects.

MP-05.12. Table 2. Clinical recommendations of urologists regarding when to resume sexual activity after surgery for BPH

Variable	Value	
Number of responding doctors	70	
Number of work years (%)		
≤10 years	19 (27.1%)	
10–20	17 (24.3%)	
20–30	12 (17.1%)	
>30	22 (31.4%)	
Work place (%)		
Academic hospital	4 (5.8%)	
Community clinic	33 (47.1%)	
Both	33 (47.1%)	
Mean number of BPH surgeries operated per month (%)		
≤5	34 (48.6%)	
5–10	28 (40%)	
10–20	8 (11.4%)	
	Endoscopic surgery	**Open surgery**
Recommendation to return to sexual activity after surgery		
Not applicable	2 (2.9%)	4 (5.7%)
Immediately	3 (4.3%)	1 (1.4%)
A week after surgery	1 (1.4%)	1 (1.4%)
7–30 days after surgery	33 (47.1%)	22 (31.5%)
1–3 months after surgery	30 (42.9%)	42 (60%)
More than 3 months after surgery	1 (1.4%)	0 (0%)
Possible adverse effects as a result of being sexually active too early		
Bleeding	54 (77.1%)	54 (77.1%)
Pain	45 (64.3%)	48 (68.6%)
Erectile dysfunction	12 (17%)	15 (21.4%)
Difficulty reaching sexual climax	12 (17%)	14 (20%)
Other	5 (7%)	4 (5.7%)

BPH: benign prostatic hyperplasia.

MP-05.13

Does vitamin D supplementation improve levels of sexual hormones, metabolic syndrome, and erectile dysfunction in middle-aged men? Prospective followup at three, six, nine, and 12 months

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Study Groups: Hamad Medical Corporation Research Centre (protocol 13294/13).

Introduction: The associations between serum vitamin D (VD), serum testosterone (TT), and metabolic syndrome are complex and with limited published research, particularly on the effects of VD supplementation on sexual hormones. This study assessed whether a monthly high-dose VD supplementation for 12 months in VD-deficient middle-aged men was associated with: changes in levels of sexual hormones, improvement of diabetes control and metabolic syndrome components, better erectile function [Index of Erectile Function (IIEF)-5 questionnaire], and changes in prostate health.

Methods: Between October 201 and September 2015, male patients ≥35 years with deficient serum VD level (<30 ng/mL) were included in the study. Participants were followed up for one year, with monitoring at three, six, nine, and 12-months. At the initial baseline visit, a complete medical examination was conducted and blood was drawn for laboratory tests for the biochemical and hormonal variables under examination. Participants received an initial VD (ergocalciferol; oral solution 600 000 IU/1.5 ml), and followed a VD supplementation regime thereafter. At the four followup visits (three, six, nine, 12 months), blood was collected, and patients' erectile function was evaluated by IIEF-5 questionnaire (Table 1).

Results: Patients' mean age was 53.2 ± 10.4 years. Serum VD exhibited significant increments from baseline (15.16 ± 4.64 ng/mL) to three (31.90 ± 15.99 ng/mL), six (37.23 ± 12.42 ng/mL), nine (44.88 ± 14.49 ng/mL), and 12 (48.54 ± 11.62 ng/mL) months, and there was significant step-ladder increases in both serum TT level (12.46 ± 3.30 to 15.99 ± 1.84 nmol/L) and erectile function scores (13.88 ± 3.96 to 19.85 ± 3.24). We also observed significant stepladder decreases in estradiol (87.90 ± 27.16 to 69.85 ± 14.80 pmol/L) and HbA1c levels (6.41 ± 2.85 to 5.86 ± 1.67 %). Mean body mass index significantly decreased and prostate-specific antigen values significantly increased at the end of the 12 months of followup. There were no changes in luteinizing hormone levels.

Conclusions: The present study demonstrated that VD supplementation improves sexual hormones, metabolic syndrome, and erectile function in middle-aged men. More randomized, placebo-controlled, interventional trials of VD supplementation in patients with the metabolic syndrome and low TT could assist in uncovering the putative roles of VD.

MP-05.14

The relationship between prostate cancer treatment and overactive bladder

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Introduction: Stress urinary incontinence (SUI) is a well-known side effect of prostate cancer treatment. Understudied is the effect of prostate cancer treatment on overactive bladder (OAB), and whether there are differential effects depending on the type of prostate cancer treatment. Thus, the objective of this study was to determine on a preliminary basis whether there was a significant change in rates of OAB after prostate cancer treatment and whether those rates differed by treatment type.

Methods: Patient-reported outcome (PRO) data was collected by the Alberta Prostate Cancer Research Initiative (APCaRI) from men prior to their diagnostic biopsy and following their prostate cancer treatment. OAB symptoms were measured by using the International Prostate Symptom Score (IPSS) matched to an OAB-related PRO instrument (the OAB-V8) via a crosswalk method. APCaRI also collected the use of OAB-related medications. IPSS scores and medication use were evaluated before treatment and at 12-month followup after prostate cancer treatment to assess changes in rates of OAB.

Results: APCaRI recruited 609 men with the required data,163 (27%) of whom were suspected of having OAB at the time of being diagnosed with prostate cancer. At the time of this analysis, 70 men had 12-month followup data available. Of these, 21 (30%) men were suspected of having OAB. The increase was statistically significant, but there were no significant differences observed across prostate cancer treatment type.

Conclusions: These preliminary results suggest that prostate cancer treatment may result in greater rates of OAB. While the use of PROs and medication use is not sufficient to diagnose OAB, these results provide motivation to investigate this phenomenon further using more rigorous urodynamic testing.

MP-05.13. Table 1. Participant characteristics at baseline, and at 3, 6, 9, and 12 months

Variable	Baseline	3 months	6 months	9 months	12 months	p
25(OH)D (ng/mL)	15.16 ± 4.64	31.90 ± 15.99	37.23 ± 12.42	44.88 ± 14.49	48.54 ± 11.62	<0.001
PTH (pg/mL)	58.52 ± 28.99	45.67 ± 21.44	38.92 ± 19.25	41.96 ± 17.00	38.33 ± 19.44	<0.001
Sex hormones						
TT (nmol/L)	12.46 ± 3.30	16.25 ± 3.68	15.98 ± 3.01	15.50 ± 2.37	15.99 ± 1.84	<0.001
LH (IU/L)	3.60 ± 1.37	3.79 ± 1.61	3.65 ± 1.63	3.54 ± 1.36	3.64 ± 1.37	0.574
Estradiol (pmol/L)	87.90 ± 27.16	75.51 ± 17.30	74.22 ± 16.85	71.44 ± 12.53	69.85 ± 14.80	0.001
Metabolic syndrome components						
Anthropometry						
BMI (kg/m^2)	33.91 ± 6.67	—	—	—	33.14 ± 6.35	0.001
Serum lipids (mmol/L)						
TChol	5.49 ± 2.11	5.43 ± 1.91	5.37 ± 1.81	5.38 ± 1.71	5.26 ± 1.58	0.168
HDL-C	0.91 ± 0.23	1.09 ± 0.14	1.19 ± 0.19	1.19 ± 0.22	1.20 ± 0.22	0.150
LDL-C	2.91 ± 0.86	2.64 ± 0.63	2.62 ± 0.48	2.77 ± 0.76	2.68 ± 0.42	0.001
TGL	1.61 ± 0.51	1.54 ± 0.39	1.44 ± 0.36	1.42 ± 0.38	1.44 ± 0.46	0.035
Diabetes control						
HbA1c (%)	6.41 ± 2.85	—	5.93 ± 2.27	5.90 ± 1.97	5.86 ± 1.67	0.001
Erectile function						
IIEF-5 score	13.88 ± 3.96	17.54 ± 3.05	18.94 ± 3.92	19.17 ± 3.31	19.85 ± 3.24	<0.001
Prostate health marker						
PSA (ng/mL)	0.59 ± 0.30	0.83 ± 0.38	0.89 ± 0.43	0.80 ± 0.40	0.82 ± 0.39	<0.001

Cell values represent means ± standard deviation; BMI: body mass index; HbA1c: glycated hemoglobin; HDL-C: high-density lipoprotein cholesterol; IIEF-5: International Index of Erectile Function-5; LDL-C: low-density lipoprotein cholesterol; LH: luteinizing hormone; PSA: prostate-specific antigen; PTH: parathyroid hormone; TChol: total cholesterol; TGL: triglycerides; TT: total testosterone; 25(OH)D: 25-hydroxyvitamin D; —: not measured.

Poster Session 6: Voiding Dysfunction, Infection, and Chronic Pelvic Pain
June 26, 2017; 0800–0930

IPD-06.01

An analysis of chronic prostatitis/chronic pelvic pain syndrome patients over 16 years reveals an evolving clinical picture

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Introduction: We believe there has been an evolution in the clinical picture of chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) patients, perhaps attributable to better clinical phenotyping of patients and advancements in treatment modalities. We sought to retrospectively analyze trends in CP/CPPS patients presenting to our chronic prostatitis (CP) clinic for evaluation and treatment over a 16-year period.

Methods: CP/CPPS patients were evaluated between 1998 and 2014 with chronic prostatitis symptom index (CPSI) and comprehensive assessment allowing retrospective (1998–2009) and prospective (2010–2014) UPOINT categorization. Patients were then stratified in four cohorts, based on year of presentation: 1998–2001, 2002–2005, 2006–2009, and 2010–2014 and variations among cohorts were analyzed.

Results: A total of 1349 patients with CP were evaluated in a single tertiary referral clinic. Mean age of the 1310 CP/CPPS patients was 44.7 years, while mean CPSI pain, urination, quality of life (QOL), and total scores were 10.6, 4.8, 7.9, and 23.3, respectively. Overall, the most prevalent UPOINT domain, urinary (U) (71.8%) predicted for a higher CPSI urination score (6.3), more frequent penile tip pain (37%), dysuria (48%), and more treatment with alpha-blockers (70%). Increase in UPOINT domains predicted higher CPSI pain, QOL, and total scores. Pain location did not predict UPOINT domain or treatment modality. Trends over time included increased prevalence of psychosocial (P), organ (O), and tenderness (T) domains, as well as increased use of alpha-blockers, neuromodulation, and phytotherapy as treatment modalities. There was little variation in age, CPSI scores, and pain locations over time (Table 1).

Conclusions: The changing clinical face of CP/CPPS reflects the increased recognition of psychosocial and pelvic floor pathology, along with the concomitant use of associated therapies. Pain/urinary symptom patterns and QOL have not changed in 16 years.

IPD-06.01. Table 1. Clinical picture of CP/CPPS: Trends over time

	1998–2001 n=195	2002–2005 n=387	2006–2009 n=357	2010–2014 n=371	p
Age	42.1	44.9	45.8	44.9	0.0185
CPSI pain	11.1	10.6	10.2	10.7	0.2000
CPSI urination	4.5	5.1	4.6	5.0	0.0564
CPSI QOL	7.8	7.7	8.1	8.2	0.2272
CPSI total	23.4	23.4	22.7	23.8	0.3599
UPOINT					
U	144 (73.8%)	291 (75.2%)	250 (70.0%)	256 (69.0%)	0.0636
P	45 (23.1%)	94 (24.3%)	94 (26.3%)	128 (34.5%)	0.0009
O	67 (34.4%)	175 (45.2%)	224 (62.7%)	194 (52.3%)	<0.0001
I	116 (59.5%)	140 (36.2%)	90 (25.2%)	94 (25.3%)	<0.0001
N	88 (45.1%)	115 (29.7%)	95 (26.6%)	104 (28.0%)	0.0003
T	55 (28.2%)	173 (44.7%)	156 (43.7%)	260 (70.1%)	<0.0001
Pain locations					
Perineum	138 (70.8%)	230 (59.4%)	210 (58.8%)	210 (56.6%)	0.0049
Testicular	95 (48.7%)	215 (55.6%)	163 (45.7%)	185 (49.9%)	0.3924
Tip of penis	57 (29.2%)	137 (35.4%)	115 (32.2%)	132 (35.6%)	0.3195
Pubic/bladder	121 (62.1%)	246 (63.6%)	217 (60.8%)	214 (57.7%)	0.1456
Urination	92 (47.2%)	165 (42.6%)	146 (40.9%)	150 (40.4%)	0.1368
Ejaculation	104 (53.3%)	182 (47%)	165 (46.2%)	164 (44.2%)	0.0591
Treatment					
Alpha-blockers	64 (32.8%)	244 (63%)	263 (73.7%)	235 (63.3%)	<0.0001
Neuromodulation	16 (8.2%)	45 (11.6%)	79 (22.1%)	95 (25.6%)	<0.0001
Phytotherapy	62 (31.8%)	139 (35.9%)	204 (57.1%)	159 (42.9%)	0.0001
Physiotherapy	13 (6.6%)	21 (5.4%)	13 (3.6%)	36 (9.7%)	0.1078
Antibiotics	53 (27.2%)	82 (21.2%)	82 (23%)	76 (20.5%)	0.1759

CPSI: chronic prostatitis symptom index; QOL: quality of life.

IPD-06.02

The ability of prior urine cultures to predict future urinary culture organisms and resistance patterns among individuals with neurogenic bladder dysfunction

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Introduction: The predictive ability of prior urine cultures has been evaluated in non-neurogenic bladder (NB) patients, but their value in the NB population has not been evaluated. Our objective was to determine if previous urinary cultures can predict the identity and susceptibility of subsequent urinary cultures in NB patients.

Methods: Patients with NB who were seen in an outpatient tertiary care urology clinic between July 2015 and July 2016 were identified (n=152). Their electronic provincial laboratory record was reviewed to identify all urine cultures in the prior two-year period.

Results: We identified 82 men and 70 women with NB (median age 48, interquartile range [IQR] 30–59) due to spinal cord injury (n=61), multiple sclerosis (n=26), spina bifida (n=25), and other causes (n=40). These individuals used spontaneous voiding (n=83), clean intermittent catheterization (n=76), indwelling catheter (n=14), or condom catheter (n= 14). 50 patients (33%) had at least two positive urine cultures and the most common organism was E. coli (125/280, 45%). Consecutive cultures were compared and the organism concordance rate between the 242 paired cultures that were at least seven days apart was 55% (n=135/242). Organism species showed higher concordance among cultures ≤90 days apart (61%) compared to those >90 days apart (36%). Prior resistance profiles showed high concordance with future resistance profiles; ciprofloxacin resistance status was the same in 79% of consecutive cultures done with 90 days, and 71% of cultures done >90 days apart. Similarly, nitrofurantoin (81% at ≤90 days and 70% at >90 days) and trimethoprim/sulfamethoxazole (75% at ≤90 days and 74% at >90 days) showed a high concordance between consecutive cultures.

Conclusions: Previous urine culture can provide valuable information when treating infections in NB patients, even when they are relatively remote. This reinforces the importance of using electronic health records to look at prior resistance patterns before initiating empirical antibiotic therapy.

IPD-06.03

The timed assessment of mobility for urinary function: A measure for functional incontinence

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Introduction: Functional incontinence is recognized as a significant cause of urinary incontinence (UI); however, it lacks a validated instrument to measure its presence and to quantify its severity. The timed get up and go test (TGUG test) is a validated method to determine timed functional mobility. Functional UI needs to take into account actions, including undressing and/or transition to the seated position for toileting. The objective of this study was to extend the concept of the TGUG to incorporate actions required for toileting for measurement of functional continence status.

Methods: Volunteers were community-dwelling adult women with UI and controls. Subjects completed the mobility sequence of: sit to stand, walk 10 m, turn, return 10 m, turn to sit, undress sufficient to sit on the urodynamics chair, and void. Initiation of voiding (uroflow start) ends the sequence. Test retest in triplicate of the full sequence, kinematic subsequences, International Physical Activity Questionnaires (IPAQ short-form) UGDI 6, Colorectal Anal Distress Inventory 8, and Pelvic Organ Prolapse Distress Inventory scores were compared. Uroflow and residual by ultrasound were completed.

Results: 30 patienst were inclued in the study (10 controls, 20 UI subjects). Mean age was 70 years (range 55–85) and mean body mass index (BMI) 30 kg/m^2. 15 patients had a history of reduced mobility due to arthritis and five had history of hip fracture. IPAQ scores included inactive, minimally active, and health-enhancing physical activity (HEPA)-active in subjects, and minimally active and HEPA-active in controls. UGDI scores ranged from 12–30 in subjects and 0–3 in controls. Prolongations in gait or undress-sit-void sequences were associated with UI. Test retest correlations were 0.84 in controls and 0.78 in incontinent subjects.

Conclusions: This sequence is reproducible within subjects and total speeds for completion were statistically different between cases and controls. Further development will include incorporation of mobility aids, as well as the effects of clothing and hand function on undressing for voiding as part of self-care in the elderly.

IPD-06.04

Real-world rates of clean intermittent catheterization following onabotulinumtoxinA treatment for idiopathic overactive bladder

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Introduction: OnabotulinumtoxinA (OBTA) injections are approved for the treatment of idiopathic overactive bladder (iOAB) in patients who have had an inadequate response to one or more anticholinergic medication(s). Urinary retention is one of the most common side effects of this treatment modality, with literature rates of clean intermittent catheterization (CIC) ranging from 2.9–16%.[1] The purpose of our study was to assess real-world rates of CIC and to determine how this event affected the individual's overall satisfaction with OBTA treatment.

Methods: We performed a retrospective chart review over a period of nine years, from May 2007 to July 2016. Over this time, 402 patients with iOAB were treated with 100 U of OBTA. Patient age ranged from 19–89 years, with a mean age of 65.7 years; 10.7% of the study population was male and 89.3% was female. The primary outcome of the study was the need for CIC. This was considered if a six-week post-void residual exceeded 200 cc and the patient experienced symptoms troubling enough to warrant intervention. Satisfaction with treatment was determined by reported symptom improvement and desire to continue with OBTA injections.

Results: Of the patients who received OBTA, 1.7% (7/402) required CIC. Length of CIC ranged from several days to six weeks post-treatment. Of the 402 patients, 326 were able to have satisfaction outcomes assessed; 87.1% (284/326) reported that they were satisfied with the treatment outcome, 12.3% (40/326) were not satisfied, and 0.6% (2/326) had mixed reactions. Of the seven patients that required CIC, 29% (2/7) were satisfied with treatment, 43% (3/7) were dissatisfied with treatment, and 29% (2/7) could not be assessed. One of the satisfied patients continued with OBTA treatment, the remaining six did not.

Conclusions: This large retrospective study over nine years of real-life urological experience indicates a much lower rate of CIC in patients receiving 100 U of OABT for iOAB than reported in the literature.[1-3]

References:

1. Chibelean C, Nechifor-Boila A. Botulinum neurotoxin A for overactive bladder treatment. *Can J Urol* 2015;22:7681-9.
2. Herschorn S, Kohan A, Aliotta P, et al. OnabotulinumtoxinA treatment results in greater reductions in urinary incontinence in patients with overactive bladder compared with solifenacin or placebo. AUA 2016; Poster MP-74-6.
3. Kennelly M, Green L, Fathali N, et al. Real-world clean intermittent catheterization rates after treatment with onabotulinumtoxinA in patients with overactive bladder. AUA 2016; Poster MP-74-8.

MP-06.01

Mirabegron as adjuvant treatment for patients with interstitial cystitis/bladder pain syndrome

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Introduction: Interstitial cystitis/bladder pain syndrome (IC/BPS) patients represent a heterogeneous group, with pain and urinary storage symptoms and varying responses to current treatment options. The novel beta-3 agonist, mirabegron, has shown to improve storage symptoms of patients with bladder overactivity; however, its effect on symptoms in the IC/BPS population has yet to be studied.

Methods: Patients diagnosed at a single IC centre with IC/BPS undergoing standard therapy were treated with additional daily mirabegron 25 mg and seen in followup post-treatment. Patients completed the Interstitial Cystitis Symptom Index and Problem Index (ICSI/ICPI) and the Pelvic Pain and Urgency/Frequency Patient Symptom Scale (PUF) prior to and following mirabegron treatment. Global (NRS) and symptom-specific outcomes were assessed by comparing the pre- and post-treatment mean scores using tailed-t test (p value <0.05 considered statistically significant).

Results: A total of 23 patients were available for review pre- and post-mirabegron treatment. There was no significant difference in ICSI (p=0.448), ICPI (p=0.352), PUF (p=0.869) pre- and post-treatment. Analysis of symptom-specific outcomes show statistical significant improvements in NRS urgency (p=0.048); however, no statistical significant improvements in NRS frequency (p=0.951) and pain (p=0.952) were observed with mirabegron therapy.

Conclusions: IC/BPS patients treated with mirabegron had improvement of urinary urgency, however, no significant benefit in terms of pain or urinary frequency. This data suggests that mirabegron's role in the IC/BPS patient should be that of adjuvant treatment to ameliorate urgency.

MP-06.02

The X-Y factor: Males and females with urological chronic pelvic pain present distinct clinical phenotypes

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Introduction: Clinical features of interstitial cystitis/bladder pain syndrome (IC/BPS) are thought to be similar to chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS); however, few studies have compared characteristics of males and females with these conditions directly. Our objective was to compare the clinical phenotypes of males and females with urological chronic pelvic pain.

Methods: We reviewed patients in a prospective, single-centre database who presented between 1998 and 2016 to our urological chronic pelvic pain clinic. Demographics, symptom scores, pain scales, retrospectively described clinical UPOINT (urinary, psychosocial, organ specific, infection, neurogenic, and tenderness) scoring, and presence of comorbid medical conditions were compared between males and females using comparative analyses.

Results: We identified 2007 subjects (1523 males; 484 females) with urological chronic pelvic pain. Females had longer symptom duration, greater urinary frequency scores, greater pain frequency scores, and higher prevalence of comorbid medical conditions (fibromyalgia, irritable bowel syndrome, chronic fatigue syndrome, diabetes, depression, alcohol use, and drug allergies) compared to males (Table 1). Females had a higher prevalence of total, urinary, organ-specific, and neurogenic UPOINT domains (Table 1).

Conclusions: Females with urological chronic pelvic pain have worse urinary symptoms and greater prevalence of systemic disorders/symptoms than males with urological chronic pelvic pain. These findings demonstrate the distinct male and female phenotypes of patients with urological chronic pelvic pain.

MP-06.02. Table 1. Comparison of males and females presenting with urological chronic pelvic pain

	n	Female	n	Male	p
Age and symptoms, mean ± SD					
Age at presentation (years)	484	45.7 ± 17.4	1523	45.1 ± 13.5	0.47
Symptom duration (years)	367	10.7 ± 11.7	1238	6.75 ± 8.6	<0.001
Urinary frequency (0–5)	466	4.0 ± 1.3	1431	2.7 ± 1.7	<0.001
Pain frequency (0–5)	466	3.2 ± 1.5	1431	3.0 ± 1.5	<0.001
Pain intensity (0–10)	464	4.1 ± 3.6	1431	4.6 ± 2.7	0.006
UPOINT					
Total (0–6), mean ± SD	483	3.2 ± 1.4	1516	2.4 ± 1.2	<0.001
Urinary, n (%)	483	448 (92.8)	1523	1029 (67.6)	<0.001
Psychosocial, n (%)	483	153 (31.7)	1523	427 (28.0)	0.12
Organ specific, n (%)	483	435 (90.1)	1523	783 (51.4)	<0.001
Infection, n (%)	483	102 (21.1)	1523	499 (32.8)	<0.001
Neurogenic, n (%)	483	216 (44.7)	1523	457 (30.0)	<0.001
Tenderness, n (%)	483	206 (42.7)	1523	740 (48.6)	0.02
Medical history, n (%)					
Fibromyalgia	484	82 (16.9)	1523	23 (1.5)	<0.001
Chronic fatigue syndrome	484	66 (13.6)	1523	25 (1.6)	<0.001
Irritable bowel syndrome	484	266 (55)	1523	170 (11.2)	<0.001
Drug allergies	484	274 (56.6)	1523	205 (13.5)	<0.001
Food allergies	484	67 (13.8)	1523	174 (11.4)	0.15
Diabetes	484	98 (20.2)	1523	59 (3.9)	<0.001
Depression	484	150 (31)	1523	280 (18.4)	<0.001
Hypertension	484	85 (17.6)	1523	844 (55.4)	<0.001
Alcohol use	484	214 (44.2)	1523	165 (10.8)	<0.001

SD: standard deviation.

MP-06.03

Pelvic floor physical therapy improves validated pelvic floor questionnaires and pelvic pain

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Introduction: Pelvic floor physical therapy (PFPT) is crucial in managing many pelvic floor disorders. We evaluated changes in validated symptom scores at intake and discharge in women undergoing PFPT at a multidisciplinary women's urology centre.

Methods: Retrospective chart review was performed of women presenting to a women's urology centre for PFPT. Pelvic floor physical therapists performed individualized interventions, including external and internal (vaginal) manual therapies, neuromuscular reeducation, and teaching home exercises and self-care. We collected pertinent history, demographic information, Pelvic Floor Distress Inventory Questionnaire (PFDI) total and domain scores (Pelvic Organ Prolapse Distress Inventory [POPDI]; Urogenital Distress Inventory [UDI]; Colorectal-Anal Distress Inventory [CRADI]), Pelvic Floor Impact Questionnaire (PFIQ), and pain levels on a 0–10 visual analog scale (VAS) scores at both intake and discharge.

Results: Of 200 women, 178 had complete information available (Table 1). Mean age was 50.3 years (standard deviation [SD] 16; range 18–83). The most common indications for PFPT were pelvic pain (95/178 [53.4%]), urinary urgency (19/178 [10.7%]), urge incontinence (16/178 [9%]), and dyspareunia (15/178 [8.4%]). Mean number of visits was 8.8 ± 5.6 and mean pain level decreased from 3.43 at the first visit to 2.09 by the last visit (p<0.0001). Pre- and post-treatment PFDI and PFIQ questionnaires were completed by 100/178 (56%) and 93/178 (52%) women, respectively. PFDI scores significantly improved, but did not meet the minimally important difference (MID); UDI scores significantly improved and did meet the MID. Although POPDI and CRADI did not significantly improve, CRADI met the MID. PFIQ scores improved significantly.

Conclusions: PFPT is an excellent tool for patient with a variety of pelvic floor complaints. Patients report improvement with pelvic pain, pelvic floor distress, and pelvic floor symptom quality of life.

MP-06.03. Table 1. Summary of questionnaire data

Questionnaire	Intake	Discharge	Absolute change	MID	p
PFDI	86.7	49.6	-37.1	-45	<0.0001
POPDI	22.1	16.4	-5.7		0.23
CRADI	22.1	13.3	-8.8	-5	0.15
UDI	33	15.4	-17.6	-11	0.002
PFIQ	85.8	48.6	-37.2		<0.0001
VAS pain score	3.43	2.09	-1.34		<0.0001

CRADI: Colorectal-Anal Distress Inventory; PFDI: Pelvic Floor Distress Inventory Questionnaire; PFIQ: Pelvic Floor Impact Questionnaire; POPDI: Pelvic Organ Prolapse Distress Inventory; UDI: Urogenital Distress Inventory; VAS: visual analog scale.

MP-06.04

Publically funded overactive bladder drug treatment patterns in Ontario over 15 years: An ecological study

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Study Groups: Ministry of Health and Long Term Care (MOHLTC) Health System Research Fund, Institute for Clinical Evaluative Sciences (ICES), Brogan Inc. Drug Product and Therapeutic Class Database.

Introduction: Medication is considered an important treatment option for patients with overactive bladder (OAB), with four different drugs approved over the last 10 years, including the first non-anticholinergic treatment option, mirabegron. We set out to describe the drug use patterns for OAB in Ontario, Canada over the last 15 years.

Methods: We conducted a repeated cross-sectional study examining quarterly publically funded prescription claims for OAB medications reimbursed by the Ontario Public Drug Program (OPDP) from January 1, 2000 to June 30, 2016 in Ontario, Canada.

Results: Over the 15-year study period, there were 10 131 681 prescription claims for publically funded OAB treatments dispensed in Ontario. The number of OAB medication users per year has increased by 221% over the study period (Fig. 1). We report two major changes in prescription patterns for OAB. The first was the rise of newer, more selective anticholinergics (tolterodine, solifenacin, and darifenacin) replacing oxybutynin. This led to a 77.4% reduction in the rate of use of oxybutynin over the study period. Recently, we see the emergence of mirabegron as the most commonly prescribed treatment for OAB. By the final quarter of the observation period, mirabegron was the most commonly used OAB treatment with 25.0% (n=19 411) of all users in Ontario (n=77 660) (Fig. 2).

Conclusions: Perceived superiority of newer agents in terms of improved dosing regimens and side-effect profiles are likely the reason for these shifts in treatment patterns. Our findings highlight the rapid uptake of novel agents and a major shift in the treatment of OAB.

MP-06.05

Do surgeon factors predict outcomes after AdVance male sling?

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Introduction: The AdVance male sling is used to treat male post-prostatectomy stress urinary incontinence (SUI). We evaluated patient selection criteria, surgical technique, and surgeon volume and experience on patient-reported outcomes.

Methods: We conducted a retrospective review of patients undergoing AdVance male sling placement from January 2006–May 2016 at a large-volume institution. Cure was defined as no pads/day or one pad for safety only, or report of 100% dry. Improvement was defined as 1–2 pads/day and >50% improvement in leakage. Failure was defined as >2 pads/day or <50% improvement in leakage.

Results: 175 men were identified. Mean age was 68 years. Operative data was available on 152 patients. 128/152 (84%) of patients were cured or improved after surgery. 12 surgeons placed AdVance slings. Surgeon volume was not associated with cure/improvement (five highest-volume surgeons 112/132 [85%] vs. five lowest-volume surgeons 16/20 [80%]; p=0.77). The first five years of surgical experience (76/95 [80%] cure/improved) was not different than most recent five years of experience (52/57 [91%] cure/improved; p=0.17). 37/175 (21%) of men had preoperative 24-hour pad weight testing, with complete data available on 32 men. Mean pad weight was 206.8 mL (range 11–739). Men who underwent pad weight testing had better outcomes than men who did not. 13/32 (41%) men were cured and 17/32 (53%) improved with pad

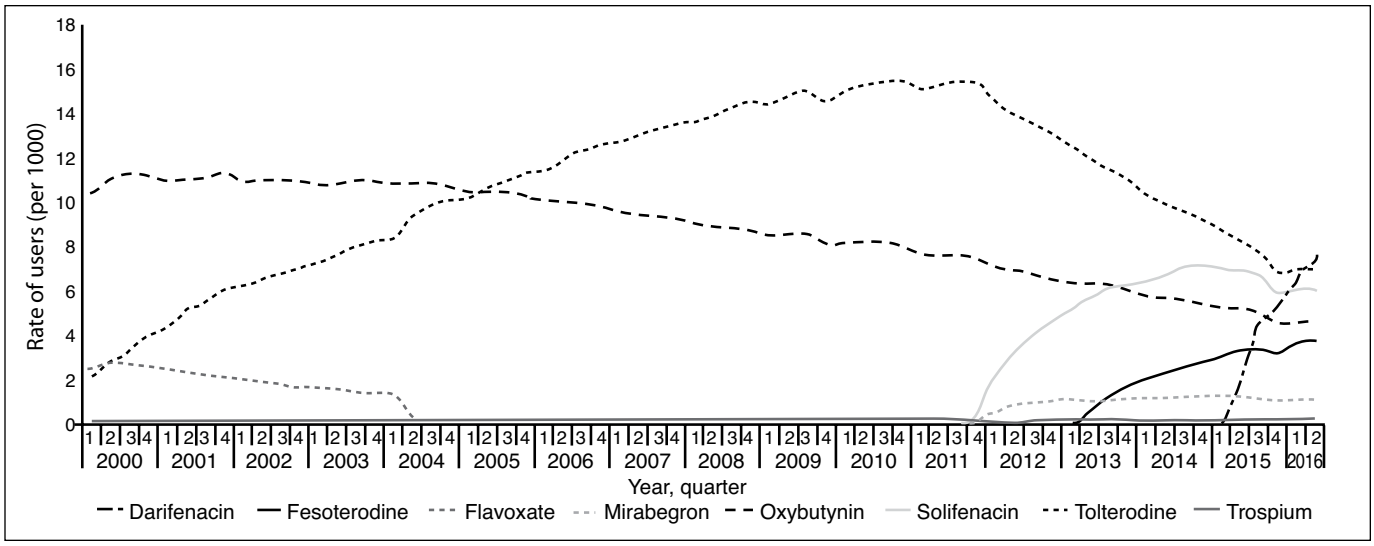

Fig. 1. MP-06.04. Rate of publicly funded overactive bladder treatment users per 1000 eligible in Ontario from 2000–2016.

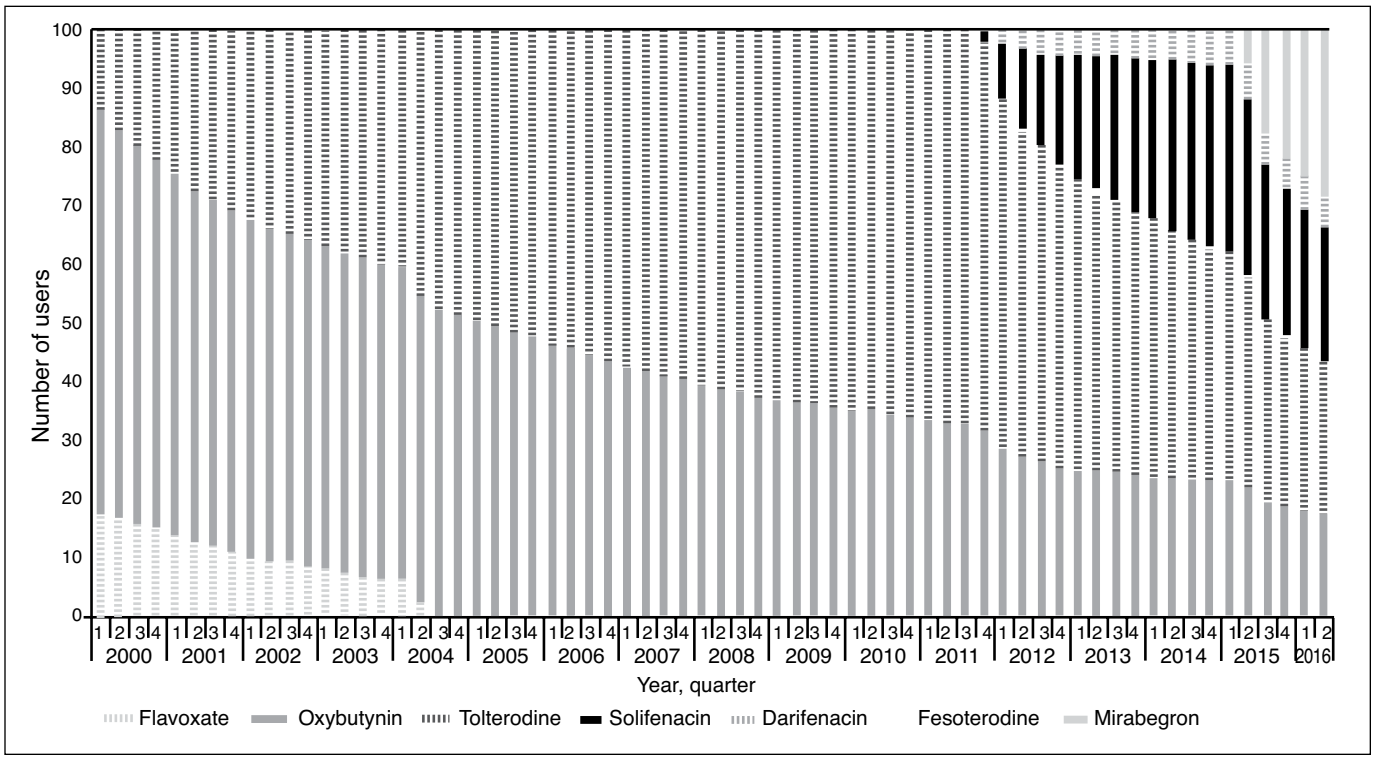

Fig. 2. MP-06.04. Proportion of publicly funded overactive bladder treatment users by drug in Ontario from 2000–2016.

weight testing vs. 66/120 (55%) cured and 32/120 (27%) improved with no pad weight testing (p=0.012). 147 men had data available on intraoperative sling tunneling and outcomes. 69/147 patients had no sling tunneling and 78 had sling tunneling. Tunneling was not associated with cure or improvement (p=0.36).

Conclusions: AdVance male sling is effective with 84% of men reporting cure or improvement. Surgeon volume, surgeon experience, and sling tunneling were not associated with outcome; however, having had pad weight testing were associated with higher rates of cure/improvement.

MP-06.06

How does the obesity epidemic change voiding dysfunction?

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Introduction: Obesity is a serious health concern. The Centre for Disease Control and Prevention reports that more than one-third of U.S. adults are obese. Few studies have examined the relationship between body mass index (BMI), voiding dysfunction, and urodynamics (UDS).

Methods: We retrospectively reviewed (UDS) of 895 patients (2010–2016); 777 had complete information for BMI and 21 with underweight BMI were excluded. We used multiple linear regression analysis for continuous outcomes and multiple logistic regression analysis for binary outcomes. Comorbidities and age >65 were used as covariates. Obese patients were defined at BMI >30.

Results: 385 (51%) patients had a BMI <30 and 371 (49%) had a BMI >30. Mean age in the non-obese group was 58 + 16.3 and in the obese group was 54 + 13.7 years (p<0.001). Mean non-obese BMI was 25.4 + 2.8 and for obese patients was 36.5 + 6.0 kg/m^2. Comorbidities significantly associated with weight were diabetes mellitus (DM) (21% vs. 36%; p<0.001), DM with end organ damage (2% vs. 6%; p=0.006), and metastatic cancer (2% vs. 0%; p=0.008). Obese patients had a significant increase in stress urinary incontinence (SUI) and urgency incontinence (UUI), and a decrease in complaints of decreased stream and urinary retention (Table 1). Obese patients showed less incomplete emptying and more SUI on UDS (Table 1). Of patients diagnosed with SUI, there was no difference in post-void residual (PVR) (mean 74.5 vs.55.3; p=0.4) or DU (odds ratio [OR] 0.9; 95% confidence interval [CI] 0.5–1.6; p=0.8).

Conclusions: Obese patients are more likely to present with incontinence and less likely to complain of voiding symptoms compared to non-obese patients. Similarly, UDS findings in obese patients show more SUI and less IE. These findings suggest that as the obesity epidemic increases, more resources may be required for provision of care for urinary incontinence. The relationship and causality between obesity, bladder contractility, and emptying needs to be further studied.

MP-06.06. Table 1. Voiding dysfunction in patients based on BMI

	BMI <30	BMI ≥30	p
Total	51%	49%	
Complaints			
Frequency	51%	54%	0.6
Urgency	57%	62%	0.4
Stress urinary incontinence	49%	63%	<0.001
Urgency incontinence	54%	69%	<0.001
Decreased stream	16%	9%	0.01
Urinary retention	34%	25%	0.02
Straining	12%	12%	0.7
Nocturia	41%	38%	0.6
UDS finding			
Qmax free flow (ml/sec)	18.3 ± 18.2	19.8 ± 12.1	0.5
First urge (ml)	227.9 ± 155.3	221.4 ± 156.0	0.7
Compliance	131.7 ± 119.3	128.0 ± 117.8	0.7
QmaxUDS (ml/sec)	13.1 ± 11.1	14.4 ± 11.0	0.3
Pdet@Qmax	41.9 ± 33.4	37.4 ± 26.0	0.1
Voided volume	244.7 ± 199.8	223.4 ± 180.5	0.8
PVR (ml)	121.5 ± 188.7	90.2 + 164.1	0.07
Diagnosis			
Bladder outlet obstruction	34%	27%	0.1
Detrusor overactivity	34%	34%	0.6
Detrusor overactivity incontinence	26%	27%	0.5
Abdominal voiding	39%	42%	0.5
Detrusor underactivity	27%	21%	0.06
Incomplete emptying	41%	30%	0.004
Stress urinary incontinence	39%	49%	0.02

BMI: body mass index; UDS: urodynamics; Qmax: maximal flow rate.

MP-06.07

Development and validation of a novel pictogram-based urinary symptom score: The visual urinary symptom score for women

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Introduction: Symptoms score are integral clinical tools in urology though they inherently depend on literacy and language interpretation. The male Visual Prostate Symptom Score has been validated on a global scale. Our

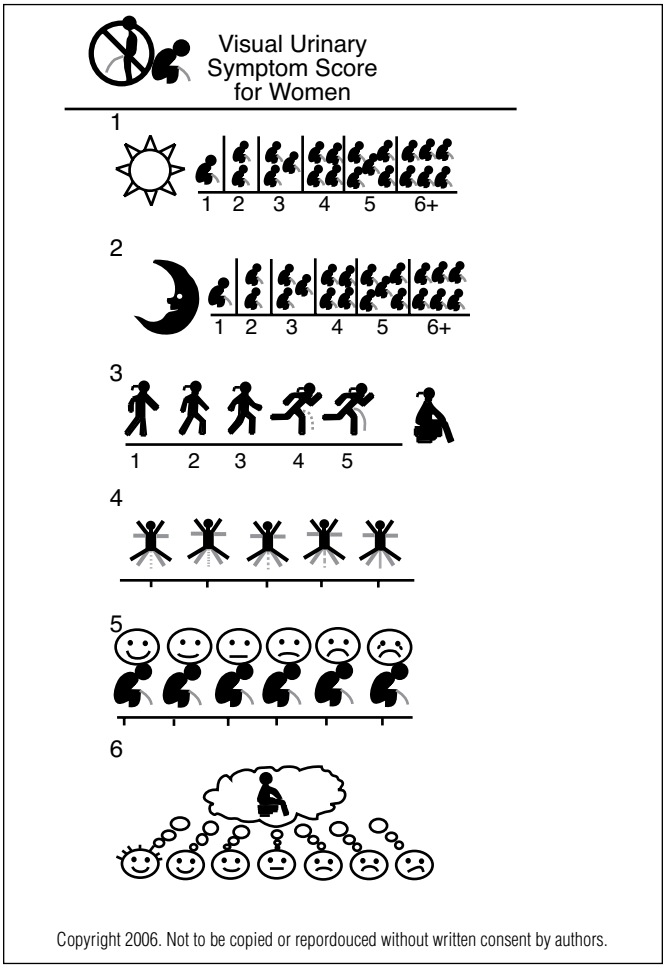

Fig. 1. MP-06.07. Visual Urinary Symptom Score (VUSS) for Women.

objectives were to develop the Visual Urinary Symptom Score for Women (VUSS) and validate content by: 1) evaluating construct validity through patient understanding of each pictogram; 2) comparing VUSS pictograms responses to the Urinary Distress Inventory (UDI-6) and the American Urological Associated Symptom Inventory (AUA-SI); and 3) obtaining patient input to enhance information capture.
Methods: Female volunteers were recruited by posters advertisement. They completed the female VUSS (Fig. 1), the UDI-6 and the AUA-SI symptom scores independently, described their interpretations of each pictogram and provided feedback for each image to improve comprehension. Statistical analysis included: Student's t, Fisher's exact, and Spearman's correlation tests.
Results: 300 scores in N=100 were collected (mean age 46, range 21-91); 25 had grade 8-12 high school education; 75 with postsecondary education (mean 4.2 years, range of 0 years – 8 years). All surveys were completed independently. VUSS Q1 and Q2, indicating daytime frequency and nocturia, had the best inherent recognition of concept with 97% correct interpretation. The quality of life pictograph had the lowest inherent recognition of concept with 72% correct interpretation. VUSS Q5, indicating dysuria, was thought by the participants to be the clearest. VUSS and UDI-6 totals had 0.878 correlation, while VUSS AUA-SI had 0.72 correlation.
Conclusions: VUSS content correlated well with UDI-6 total scores. Comprehension would benefit from increasing contrast in pictograms. Further development can add to the ability to measure women's LUTS on a global scale to reduce language and literacy barriers to urologic history taking. Next steps will incorporate changes from this validation and testing in a low resource environment.

MP-06.08
Physiological factors that impact voluntary detrusor contraction duration in females

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Introduction: The contribution of detrusor contraction duration (DCD) for voiding function in females has not been well-studied. We analyzed factors that influence DCD duration to understand its role.
Methods: We retrospectively reviewed urodynamic studies of 356 female patients (2010–2016). 303 patients had measurable voluntary DCD. Independent variables analyzed included voided volume (VV), post-void residual (PVR), detrusor pressure at maximum flow (PdetQmax), bladder compliance (BC), maximum flow rate (Qmax), and bladder outlet obstruction (BOO). Multiple regression analysis determined which independent variables were related to DCD. Variables dependent upon each other were not analyzed together.
Results: Of 303 females, mean age was 55.0 ± 14.4 years and mean DCD was 86.9 ± 69.2 seconds. Multiple regression analysis results using different combinations of independent variables (with DCD as outcome) are shown in Table 1. Increased PdetQmax ($p<0.001$), voided volumes ($p<0.001$), Qmax ($p<0.05$), and severity of BOO ($p<0.05$) were consistently associated with increased DCD. DCD was not associated with BC. Regression 1 shows when Qmax increases by 1 mL/s, DCD decreases by 1.115 ± 0.462 seconds. Each increase in PdetQmax by 1 cm H_2O increases DCD by 0.636 ± 0.186 seconds. Each increase in 1 mL VV leads to increase in DCD by 0.102 ± 0.023 seconds. Regression 2 shows that when Grade 1 BOO is compared to Grade 0, DCD is on average 22.11 ± 8.60 seconds longer. Similarly, when Grade 2 BOO is compared to Grade 0, DCD is on average 37.88 ± 14.12 seconds longer. For each increase in VV of 1 mL, DCD increases by 0.082 ± 0.022 seconds.
Conclusions: In women, longer DCD is influenced by higher PdetQmax and VV. Furthermore, increasing severity of BOO is associated with longer DCD. Understanding which factors influence DCD in women may help better understand the function of this often overlooked urodynamic parameter. Further studies are needed to clarify the predictive value of DCD.

MP-06.08. Table 1. Multiple regression analysis results

Regression 1	**Regression coef**	**p**
Qmax (mL/s)	-1.115 ± 0.462	0.016
PdetQmax (cmH_2O)	0.636 ± 0.186	<0.001
Voided volume (mL)	0.102 ± 0.023	<0.001
BC (mL/cmH_2O)	25.70 ± 18.08	0.156
Regression 2	**Regression coef**	**p**
BOO (Grade 1 vs. 0)	22.11 ± 8.60	0.011
BOO (Grade 2 vs. 0)	37.88 ± 14.12	0.008
Voided volume (mL)	0.082 ± 0.022	<0.001
BC (mL/cmH2O)	22.067 ± 18.27	0.228

BC: bladder compliance; BOO: bladder outlet obstruction; PdetQmax: detrusor pressure at maximum flow.

Poster Session 7: Investigative Urology
June 26, 2017; 0800–0930

IPD-07.01

Magnetic resonance measurement of luminal water in prostate gland: Quantitative correlation between magnetic resonance imaging and histology

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Introduction: We aim to determine the relationship between parameters measured from luminal water imaging (LWI), a new magnetic resonance imaging (MRI) T2 mapping technique, and the corresponding tissue composition in the prostate. LWI is also compared to diffusion-weighted imaging (DWI) and dynamic contrast-enhanced (DCE) MRI.

Methods: 17 patients with biopsy-proven prostate cancer (PCa) were examined with LWI, DWI, and DCE MRI on a 3T scanner prior to undergoing radical prostatectomy. Maps of seven MR parameters, called N, T2-short, T2-long, Ashort, Along, gmT2, and luminal water fraction (LWF), were generated using non-negative least squares (NNLS) analysis of the T2 decay curves. MR parametric maps were correlated to digitized whole-mount histology sections. Percentage area of tissue components, including luminal space, nuclei, and cytoplasm plus stroma, was measured on the histology sections by using colour-based image segmentation. Spearman's rank correlation test was used to evaluate the correlation between MR parameters and the corresponding tissue components, with particular attention paid to the correlation between LWF and percentage area of luminal space.

Results: This pilot study showed very high accuracy of LWI parameters (N, T2-short, Along, gmT2, and LWF) in detecting cancer. Among the single MRI parameters, the highest area under ROC curve (AUC) was obtained for: ADC and Ashort in the entire prostate, gmT2, LWF, and Along in the peripheral zone (PZ), and gmT2 and LWF in transition zone (TZ). In our multiparametric analysis, the highest AUC value in the entire prostate was obtained for combination of LWI, DCE, and DWI, while in PZ the highest value of AUC was obtained for combination of LWI with either of the other two techniques. In TZ, there was no significant difference in AUC value obtained from different combinations. In PZ, the strongest correlation with GS was achieved by LWF (ρ-0.81 ± 0.09; $p<0.001$).

Conclusions: LWF measured with MRI is strongly correlated to the fractional amount of luminal space in prostatic tissue. This translated into high rates of cancer detection and strong correlation to Gleason grade. Values of AUC obtained from LWI are equally good or better than those obtained from DCE and DWI. For both DCE and DWI, diagnostic accuracy is improved when combined with LWI. We are developing tissue classifiers based on LWI parameter, which, with machine-learning technology, shorter acquisition times, and no need for contrast injection, has the potential of replacing multiparametric MRI as the standard.

IPD-07.02

Comprehensive immune transcriptomic analysis in bladder cancer reveals subtype-specific immune gene expression patterns of prognostic relevance

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Introduction: Genome wide profiling of muscle-invasive bladder cancer (MIBC) identified distinct genomic and transcriptomic molecular subtypes with variability in treatment response.[1-3] A better understanding of the pre-existing tumour immune landscape is needed for precise immunotherapy.

Methods: We performed a comprehensive in silico immune transcriptomic profiling of previously defined MIBC subtypes from The Cancer Genome Atlas (TCGA) (n=412). We assembled 828 immune response genes, particularly Type I and II interferon pathways and others. The discovery cohort consisted of 122 cases identified by TCGA[4] into four subtypes. The remaining 245 cases, after exclusion, comprised the validation cohort. Gene expression data was analyzed in R. One-way ANOVA with false-discovery rate correction identified differentially expressed genes across subtypes. Protein Analysis Through Evolutionary Relationships (PANTHER)[5] determined enriched pathways.

Results: In the discovery cohort, 452 genes were differentially expressed among the four subtypes and evaluated by clustering (Fig. 1; available at https://cua.guide/). Cluster I associated with decreased expression whereas cluster IV showed the most dominant response. 64 genes, top 20% ranked genes, distinguished the four clusters in an unsupervised analysis (Fig. 2; available at https://cua.guide/). Significant differences were seen in 121 IFN-associated gene expression (Fig. 3; available at https://cua.guide/). Top five overrepresented pathways distinguishing the subtypes included T-cell activation, JAK/STAT, TLR, and interleukin-signalling pathways. Most enriched biological processes were response to IFN-γ, antigen processing and presentation, cytokine-mediated signalling, and B-cell-mediated immunity.

Conclusions: The findings provide insights into genomic subtypes and immune activation in MIBC and may open new opportunities for treatment. Given the reported differences in chemotherapy and disease prognosis among the subtypes, future investigations should focus on establishing immune expression patterns as prognostic biomarkers.

References:

1. Choi W, Porten S, Kim S, et al. Identification of distinct basal and luminal subtypes of muscle-invasive bladder cancer with different sensitivities to frontline chemotherapy. *Cancer Cell* 2014;25:152-65. https://doi.org/10.1016/j.ccr.2014.01.009
2. Damrauer JS, Hoadley KA, Chism DD, et al. Intrinsic subtypes of high-grade bladder cancer reflect the hallmarks of breast cancer biology. *Proc Natl Acad Sci U S A* 2014;111:3110-5. https://doi.org/10.1073/pnas.1318376111
3. Knowles MA, Hurst CD. Molecular biology of bladder cancer: New insights into pathogenesis and clinical diversity. *Nat Rev Cancer* 2015;15:25-41. https://doi.org/10.1038/nrc3817
4. The Cancer Genome Atlas Research Network. Comprehensive molecular characterization of urothelial bladder carcinoma. *Nature* 2014;507:315-22. https://doi.org/10.1038/nature12965
5. Mi H, Muruganujan A, Casagrande JT, et al. Large-scale gene function analysis with the PANTHER classification system. *Nat Protoc* 2013;8:1551-66. https://doi.org/10.1038/nprot.2013.092

IPD-07.03

Cost-utility analysis of the Prolaris test for prostate cancer in patients with a positive biopsy

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Introduction: Improving the accuracy of risk stratification at diagnosis is an important goal in prostate cancer (PCa) research. The fast growth of the field of molecular diagnostics has created a need for cost-effectiveness evidence.

Methods: A Markov model was used to estimate the quality adjusted life years gained (QALYs) and costs for three strategies (the standard 12-core transrectal ultrasound-guided biopsy (TRUSGB) strategy, the magnetic resonance imagining-guided biopsy (MRGB) strategy, and the standard TRUSGB plus Prolaris) over five, 10, 15, and 20 years. The model takes into account the accuracy of diagnostic tests and the probability of being assigned to various treatment options. We assumed that patients recategorized with Prolaris to very-low-risk PCa will all be placed on active surveillance. Direct medical costs based on the Quebec healthcare system's perspective were included. The cost-utility analysis was performed by dividing the difference in costs by the difference in QALYs between the TRUSGB + Prolaris strategy, and TRUSGB and MRGB strategies.

Results: The difference in QALYs between TRUSGB + Prolaris and TRUSGB ranged from 0.01–0.11, with the highest difference observed over the 20-year time horizon. The corresponding values of the cost difference ranged from $1900 CAD and $1000 CAD. In addition, no benefit in QALY was observed between the TRUSGB + Prolaris strategy and the MRGB strategy; however, a higher cost was observed in the TRUSGB + Prolaris strategy (between $2300 CAD at five years and $4300 CAD at 20 years). The cost-utility analysis revealed an incremental cost-utility ratio (ICUR) as high as $190 000 CAD/QALY at five years and as low as $9200 CAD/QALY at 20 years.

Conclusions: Our preliminary results suggest that the incorporation of Prolaris in PCa diagnosis represents a cost-effective measure over a 10-, 15- and 20-year time horizon, with an incremental cost-effectiveness ratio (ICUR) below the threshold of 50 000 CAD; however, the TRUSGB + Prolaris strategy was costlier and less effective than the MRTB strategy.

IPD-07.04

Cost-effectiveness of targeted antimicrobial therapy in transrectal ultrasound-guided prostate biopsy

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Introduction: Prophylactic antibiotics are recommended by the Canadian Urological Association (CUA) guidelines to reduce infectious complications following transrectal prostate biopsy (TRPB).[1] Evidence for fluoroquinolone (FQ) prophylaxis is strong, but high rates of FQ resistance worldwide have led to increased incidence of post-biopsy infections. Targeted antimicrobial prophylaxis based on rectal swab and culture can decrease rates of post-biopsy infections. To our knowledge, this is the first North American cost utility analysis of rectal swabs as a tool to reduce infectious complications after prostate biopsy.

Methods: A decision-analytic model was prepared to compare costs of TRPB infectious complications (no infection, outpatient prostatitis, or inpatient prostatitis) among patients who receieved standard three-day ciprofloxacin prophylaxis compared to targeted three-day antimicrobials (Fig. 1). Rates of infection were based on a recent large meta-analysis[2] and rates of resistance were based on local institutional data. Local costs were compiled for daily inpatient stay, common oral and intravenous antibiotics, and investigations. Quality-adjusted life years (QALYs) were calculated based on standard utility values for healthy adult men, outpatient urinary tract infections (UTIs), and inpatient UTIs (as surrogates for prostatitis). Several presumptions were made to produce a typical index patient of a healthy man 50–70 years of age with no known multidrug resistance.

Results: Culture-guided prophylaxis resulted in reduced cost compared to standard prophylaxis ($77 vs. $143 CAD) and reduction in QALYs by 0.00051. Increasing the cost of performing rectal swabs from $31 to $95 CAD causes the two arms to equalize at $141 CAD. The use of targeted prophylaxis would decrease the cost to the patient by $83 CAD.

Conclusions: The use of rectal swabs prior to prostate biopsy for targeted prophylactic antimicrobial therapy is both less costly and more effective than standard ciprofloxacin prophylaxis.

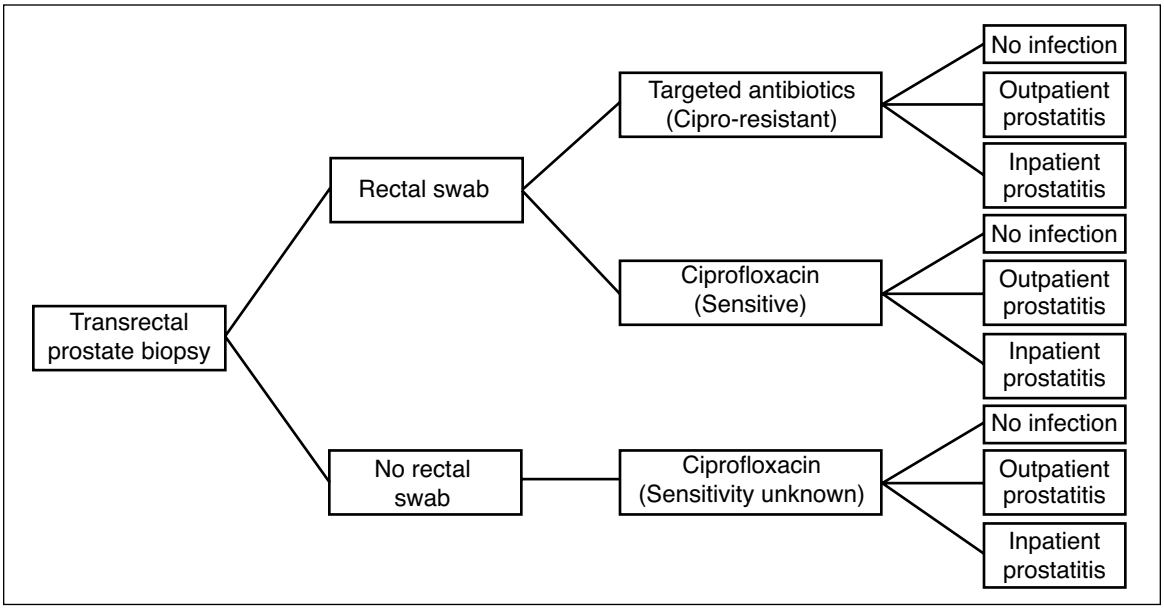

Fig. 1. IPD-07.04. Decision tree for infectious complications with and without targeted antimicrobial prophylaxis prior to prostate biopsy.

References:
1. Mrkobrada M, Ying I, Mokrycke S, et al. CUA Guidelines on antibiotic prophylaxis for urologic procedures. Can *Urol Assoc J* 2015;9:13-22. https://doi.org/10.5489/cuaj.2382
2. Cussans A, Somani BK, Basareb A, et al. The role of targeted prophylactic antimicrobial therapy before transrectal ultrasonography-guided prostate biopsy in reducing infection rates: A systematic review. *BJU Int* 2016;117:725-31. https://doi.org/10.1111/bju.13402

MP-07.01
I2b2 exceeds the gold standard in identifying cohorts with urinary tract pathology

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Study Groups: CHEO Research Institute, Summer Studentship Award.

Introduction: Informatics for Integrating Biology & the Bedside (i2b2) is a National Institutes of Health (NIH)-developed software, created as an open-source platform to securely store and search health data, as well as provide computational tools for data analysis. Our goal was to compare i2b2's ability to identify patients with urinary tract dilation (UTD) or cystic renal disease within our institutional electronic medical record (EPIC) database to manual Decision Support (DS), which is our current gold standard method for cohort identification.

Methods: Both the i2b2 software and DS queried the electronic medical record (EPIC) for eligible participants (children <3 years of age with a diagnosis of UTD or cystic renal disease, defined by relevant ICD-10 codes). All records, including patient demographics, diagnosis codes, clinic and operative notes, and ultrasound reports were assessed to determine accuracy. Sensitivity of i2b2 and DS to correctly identified patients and time to complete search were assessed.

Results: The searches conducted by i2b2 and DS yielded 245 and 228 patients, respectively. Together, 247 unique patients were included in the study. i2b2 missed five patients (found by DS), all of them due to technical problems searching the age range. The DS missed 20 patients (found by i2b2) for the following reasons: 10 incorrect diagnosis codes, four incorrect date range, two 'no show' in clinic, and four technical errors. The actual search time of the i2b2 software to retrieve the cohort list was 7.2 seconds vs. one week for DS. Table 1 details the search, as well as the sensitivity of i2b2 and DS, which was 0.98 and 0.92, respectively.

Conclusions: i2b2 is a powerful cohort identification tool that allows clinicians to accurately identify patients for quality improvement efforts and research. Following our local implementation, we found that i2b2 successfully identified a cohort of patients with genitourinary disease with greater accuracy and in a fraction of the time of traditional DS.

MP-07.01. Table 1. Search results generated by i2b2 and Decision Support

Total number of unique patients (N)	247	
	i2b2	**Decision Support**
Total number of patients found by each search (n)	245	228
Number of patients missed (n)	5	20
Sensitivity	0.98	0.92
Time to complete search	7.2 s	>1 week

MP-07.02
Y-box binding protein-1 is crucial in acquiring drug resistance in advanced renal cell carcinoma

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Study Groups: Alan So Group.

Introduction: Renal cell carcinoma (RCC) is the sixth most common malignancy, with 3% annual increase in Canada. Metastatic RCC is treated first-line with tyrosine-kinase inhibitors (TKI) to lengthen survival, but no cure yet exists.[1] TKI-resistance (sunitinib) develops after a median time of 10–14 months.[2] Therefore, identifying the factor(s) responsible for TKI-resistance development and disease advancement in RCC is imperative. Y-box binding protein-1 (YB1) is essential for cell growth and survival.[3] Upregulation of YB1 in numerous cancer types is positively correlated with tumour growth, metastasis, and drug-resistance.[4-6] YB1 is also involved in intercellular communication through its secretion into the tumour microenvironment by cell-surface transporters, ABCB1.[7]

Methods: Caki-1WT (sunitinib-sensitive) and Caki-1DC (sunitinib-resistant) were cocultured with HUVEC followed by scratch assay to test for HUVEC cell migration and associated secretory factors. Western-blot and qPCR were used to determine protein and mRNA levels, respectively. We have developed sunitinib-resistant tumour mouse model and immunohistochemical staining was carried out on the tumours. Granular structures were observed using immunofluorescence staining. Presto-blue was used for cell biomass assay.

Results: HUVEC had increased migration with Caki-1DC compared to Caki-1WT. A drastic increase in YB1 and its downstream target in Caki-1DC compared to Caki-1WT was detected. Granular structures observed in Caki-1DC support the potential secretion of YB1. Moreover, blocking ABCB1 reverted the Caki-1DC cells to being drug-sensitive.

Conclusions: The molecular function of YB1 in RCC and its potential in targeted therapy is not well-understood. Our data demonstrate that inhibition of YB1 slows disease progression and reverts drug resistance. The results from this study suggest that YB1 inhibitors could be used in conventional RCC chemotherapy to improve survival in advanced kidney cancer patients.

References:
1. Rendon RA, Kapoor A, Breau R, et al. Surgical management of renal cell carcinoma: Canadian Kidney Cancer Forum consensus. *Can Urol Assoc J* 2014;8:E398-412. https://doi.org/10.5489/cuaj.1894
2. Goldberg SB, Oxnard GR, Digumarthy S, et al. Chemotherapy with erlotinib or chemotherapy alone in advanced non-small-cell lung cancer with acquired resistance to EGFR tyrosine kinase inhibitors. *Oncologist* 2013;18:1214-20. https://doi.org/10.1634/theoncologist.2013-0168
3. Lasham A, Print CG, Woolley AG, et al. YB-1: Oncoprotein, prognostic marker, and therapeutic target? *Biochem J* 2013;449:11-23. https://doi.org/10.1042/BJ20121323
4. Dey A, Robitaille M, Remke M, et al. YB-1 is elevated in medulloblastoma and drives proliferation in Sonic hedgehog-dependent cerebellar granule neuron progenitor cells and medulloblastoma cells. *Oncogene* 2016;35:4256-68. https://doi.org/10.1038/onc.2015.491
5. Gimenez-Bonafe P, Fedoruk MN, Whitmore TG, et al. YB-1 is upregulated during prostate cancer tumour progression and increases P-glycoprotein activity. *Prostate* 2004;59:337-49. https://doi.org/10.1002/pros.20023
6. Wang Y, Chen Y, Geng H, et al. Overexpression of YB1 and EZH2 are associated with cancer metastasis and poor prognosis in renal cell carcinomas. *Tumour Biol* 2015;36:7159-66. https://doi.org/10.1007/s13277-015-3417-z
7. Frye BC, Halfter S, Djudjaj S, et al. Y-box protein-1 is actively secreted through a non-classical pathway and acts as an extracellular mitogen. *EMBO Rep* 2009;10:783-9. https://doi.org/10.1038/embor.2009.81

MP-07.03

Effect of combination therapy of desmopressin and docetaxel on prostate cancer cell DU145 proliferation, migration, and growth

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Study Groups: Comparative Research Department, Sunnybrook Research Institute.

Introduction: This study was designed to assess the efficacy of the combination of desmopressin and docetaxel for prostate cancer. Desmopressin has been demonstrated to inhibit tumour progression and metastasis in in vitro and in vivo models of breast cancer. Docetaxel, an antimitotic chemotherapeutic agent, is widely used for the treatment of castration-resistant prostate cancer (CRPC). However, it is associated with adverse effects and eventual drug resistance. This is the first report on the effect of combining desmopressin and docetaxel in CRPC cell line, both in vitro and in vivo.

Methods: An established CRPC cell line, DU145, was used. Cellular proliferation was determined using the MTS assay. The migratory inhibition potential of desmopressin alone and in combination with docetaxel was accessed using the wound healing assay. In vivo evaluation was performed on a prostate cancer xenograft model using athymic nude mouse. Treatment was administered biweekly and tumour volume was measured throughout the treatment period. Eventually, after a six-week treatment period, tumours were excised and measured.

Results: A combination therapy of 1 μM desmopressin with 100 nM docetaxel resulted in dramatic inhibition of proliferation of DU145 cells 72 hours post-treatment compared to either agent along ($p<0.05$) (Fig. 1A; available at https://cua.guide/). Wound-healing assay revealed inhibition of cellular migration as well ($p<0.05$) (Figs. 1B, 1C; available at https://cua.guide/). The use of a xenograft mouse model followed by treatment with 5 mg/kg docetaxel intraperitoneally with concomitant 2 μg/ml/kg desmopressin administered intravenously 30 minutes before administering chemotherapy and 24 hours after, resulted in a significant decrease in tumour volume ($p<0.05$), while not impacting body weight (Figs. 2, 3; Fig. 3 available at https://cua.guide/).

Conclusions: Desmopressin significantly enhanced the antiproliferative and inhibited the migratory potential of docetaxel. Suggested mechanism is illustrated in Fig. 4. Combination treatment had no additional effect on mice weight or mortality. This potentially could enhance the efficacy of docetaxel-based chemotherapy treatment for CRPC. Further clinical evaluation is warranted.

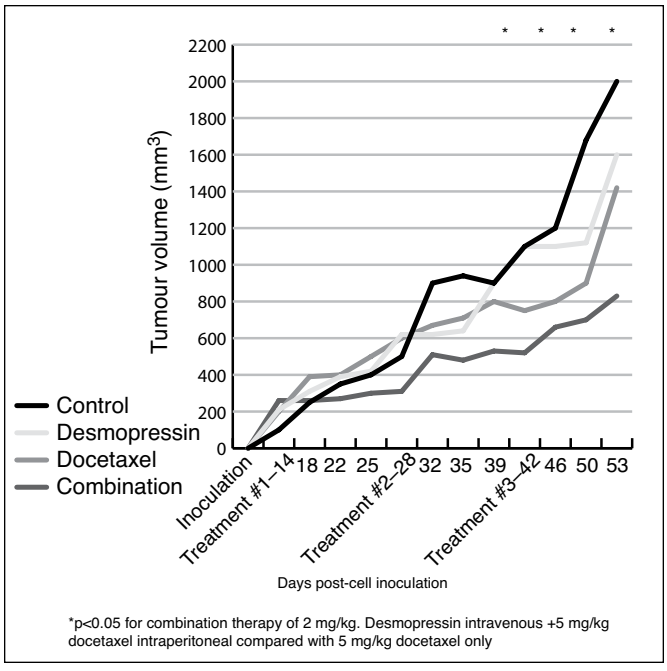

Fig. 2. MP-07.03. Impact of docetaxel with concomitant desmopressin on tumour volume.

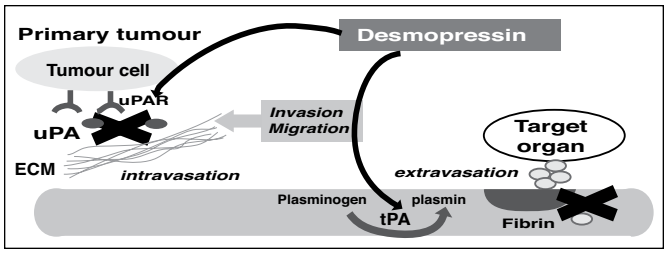

Fig. 4. MP-07.04. Suggested mechanism of desmopressin's effect on docetaxel.

MP-07.04

Development of a multigenic bioluminescence imaging system to detect prostate cancer cells and assess their response to therapy

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Introduction: Currently, liquid biopsies for imaging single cancer cells to provide personalized medicine is gaining importance. Recently, molecular imaging using amplification systems has been developed, but a system enabling both prostate cancer (PCa) cell detection and treatment response assessment is lacking.[1] PCA3 RNA is a PCa biomarker studied for PCa screening and detection.[2] prostate-specific antigen (PSA) gene is another biomarker of clinical significance that gives an account of response to androgen-deprivation treatment (ADT).[3] In this study, we have developed an imaging system based on the combined activities of the PCA3 and PSA gene promoters for single PCa cell detection and ADT response assessment from patients' body fluids.

Methods: Adenoviruses were constructed using the ability of site-specific recombination of the Cre-Lox system, integrating both PCA3 and PSA promoters into a single backbone. One promoter drives the expression of Cre, while the other drives the amplification system and the firefly luciferase (fl) to generate the multigenic-integrative transcriptional amplification system (MP-ITSTA). PCa cell specificity and ADT response was tested by transient infection. Spiked or PCa cells from patients were purified from urine and infected with MP-ITSTA; single-cell imaging was done using bioluminescence microscopy.

Results: We show that the PCA3-TSTA is specific to PCa cells, giving 8.5–108.4-fold higher expression compared to non-PCa cells. PSA-TSTA activity is androgen responsive, but not PCa-specific. We show that MP-ITSTA reporter expression is dependent on combined activation of two promoters in a dihydrotestosterone (DHT)-dependent manner. MP-ITSTA could determine response to anti-androgen (AA) in PCa cells. MP-ITSTA could specifically target spiked PCa cells isolated from urine and determine their response to AA. MP-ITSTA could also detect PCa cells from PCa patients and determine their heterogeneous response to AA.

Conclusions: MP-ITSTA, therefore, represents a PCa-specific and non-invasive tool to target PCa cells and determine single-cell response to AA.

References:
1. Pouliot F, Karanikolas BDW, Johnson M, et al. In vivo imaging of intraprostatic-specific gene transcription by PET. *J Nucl Med* 2011;52:784-91. https://doi.org/10.2967/jnumed.110.084582
2. Neveu B, Jain P, Têtu B, et al. A PCA3 gene-based transcriptional amplification system targeting primary prostate cancer. *Oncotarget* 2016;7:1300-10.
3. Jain P, Neveu B, Velot L, et al. Bioluminescence microscopy as a method to measure single-cell androgen receptor activity heterogeneous responses to anti-androgens. *Scientific Reports* 2016;6. https://doi.org/10.1038/srep33968
4. Kaczmarczyk SJ, Green JE. A single vector containing modified cre recombinase and LOX recombination sequences for inducible tissue-specific amplification of gene expression. *Nucleic Acids Res* 2001;29:e56. https://doi.org/10.1093/nar/29.12.e56

MP-07.05

Urothelial cells express a functional succinate receptor GPR91

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Introduction: Overactive bladder is associated with metabolic syndrome.[1] Increased succinate production is detected in the presence of hyperglycemia and hypoxemia and metabolic syndrome.[2] Succinate was recently identified as a major metabolic switch controlling body metabolic functions through its receptor GPR91 (SUCNR1).[3] The aim of our study is to determine how succinate interacts with urothelial cells via its receptor.

Methods: Urothelial cells were isolated from female Sprague-Dawley rat bladder. Cells passages 2–5 were exposed to succinate then treated for microscopy and immunoblotting. Cyclic AMP and PGE2 were measured in the medium by ELISA. Medium nitric oxide was assessed by a colorimetric method. Retroviruses were generated for shRNA-mediated knockdown of GPR91 and experiments were reproduced.

Results: Urothelial cells were characterized using cytokeratin 17 and the AE1/AE3 antibody. Reverse transcription polymerase chain reaction (RT-PCR) confirmed expression of GPR91. Short-term incubation with succinate (200 μM) results in phosphorylation of Erk and JNK. MAPK pathway inhibitor "PD98059" (10 μM) inhibited increases of Erk-P by succinic acid. However, pre-incubation with succinate dose-dependently decreased the concentrations of intracellular cyclic AMP stimulated by forskolin. Succinate triggers entry of calcium into urothelial cells as visualized by confocal microscopy. Long-term incubation with succinate increased nitric oxide release and decreased PGE2. GPR91 knockdown urothelial cells displayed a strong decrease in GPR91 expression. This was associated with a loss of succinate-stimulated cellular pathways seen in wild-type cells.

Conclusions: Succinate effect through GPR91 receptor in the urothelial cells elucidated another aspect of the pathophysiologic mechanisms involved in the development of overactive bladder in the context of metabolic syndrome. The activated pathways in response to succinate stimulation through GPR91 tend to interfere with the physiological effect of urothelium.

References:

1. Hammarsten J, Peeker R. Urological aspects of the metabolic syndrome. *Nat Rev Urol* 2011;8:483-94. https://doi.org/10.1038/nrurol.2011.112
2. Ariza AC, Deen PM, Robben JH. The succinate receptor as a novel therapeutic target for oxidative and metabolic stress-related conditions. *Front Endocrinol* 2012;3:22. https://doi.org/10.3389/fendo.2012.00022
3. de Castro Fonseca M, Aguiar CJ, et al. GPR91: Expanding the frontiers of Krebs cycle intermediates. *Cell Commun Signal* 2016;14:3. https://doi.org/10.1186/s12964-016-0126-1

MP-07.06

Predictors of trainees' robotic anastomosis competence evaluation (RACE) scores of a simulated Da Vinci robot-assisted urethrovesical anastomosis on a novel 3D-printed bladder model

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Study Groups: McMaster Surgical Associates, Masonic Foundation of Ontario.

Introduction: Surgical simulation is becoming more popular, yet no standardized curricula or evaluation metrics for simulator training exist. We evaluated the predictability of trainees' scores on the Robotic Anastomosis Competence Evaluation (RACE)[1] after performance of a robot-assisted urethrovesical anastomosis (UVA) on a novel 3D-printed bladder model.

Methods: We developed a unique robotic training curriculum to mimic the skills required to complete a UVA. Medical students, residents, and fellows were randomized to training on the dV-Trainer or the da Vinci Surgical Skills Simulator (dVSSS). Participants then used the da Vinci robot to complete a UVA on the bladder model affixed within a silicone torso. The simulator composite scores for each of the three progressively difficult tasks were uploaded, and three blinded expert robotic surgeons independently evaluated endoscopic videos of each UVA performance using RACE and the Global Evaluative Assessment of Robotic Skills (GEARS).[2]

Results: 39 participants (10 medical students, 26 residents, three fellows) completed the study. Mean age was 26.7 ± 0.9 years and 26 were male. For the UVA task, mean GEARS and RACE scores (both out of a total score of 30 across six domains) were 20.6 ± 0.9 and 21.2 ± 1.0, respectively. On univariate analysis, higher level of training, previous robotic simulation experience, previous laparoscopic and/or robotic experience, dVSSS curricula, higher cumulative simulator scores, and high GEARS scores were all positively associated with RACE scores. On multivariate regression analysis, GEARS scores were shown to be an independent predictor for RACE scores.

Conclusions: This study demonstrated that the GEARS scores were an independent predictor of positive performance of a simulated UVA on a 3D-printed bladder model based on RACE scores. Further research is required to determine additional significant predictors of trainees' success in performing a UVA in a simulated setting.

References:

1. Raza SJ, Field E, Jay C, et al. Surgical competency for urethrovesical anastomosis during robot-assisted radical prostatectomy: Development and validation of the robotic anastomosis competency evaluation. *Urology* 2015;85:27-32. https://doi.org/10.1016/j.urology.2014.09.017
2. Aghazadeh MA, Jayaratna IS, Hung AJ, et al. External validation of Global Evaluative Assessment of Robotic Skills (GEARS). *Surg Endosc* 2015;29:3261-6. https://doi.org/10.1007/s00464-015-4070-8

MP-07.07

Tertiary lymphoid structures reflect a potential role of B lymphocytes in the tumour immune microenvironment of bladder cancer

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Study Groups: Drs. Brad Nelson, David Kroeger, and Katy Milne at Deeley Research Centre, BCCA.

Introduction: Bladder tumours show extensive lymphocytic infiltration and, therefore, a good model to study the immunopathological distributions of immune cells to determine their prognostic relevance. The contribution of B cell-associated responses is poorly understood in bladder cancer. Lymphoid neogenesis is a hallmark of an active immune response at tumour sites that sometimes leads to formation of tertiary lymphoid structures (TLS) that resemble germinal centres formed during a classical immune response. This study was conducted with an aim to investigate the presence and characteristics of TLS in bladder cancers with a focus to compare and contrast the TLS formation in treatment naive TaLG and T2HG bladder cancers.

Methods: The discovery cohort consisted of transurethral bladder resection tumour (TURBT) specimens from 28 patients. There were 12 patients in the TaLG group (10 males, two females); and 16 patients in the T2HG group (15 males, one female). Lymphocytic infiltration in formalin fixed specimens was initially confirmed by evaluation of hematoxylin and eosin stained formalin fixed sections of the TURBT specimens. Sections showing lymphoid aggregates were further subjected to a six-colour immunohistochemistry (IHC)[1] for CD20+ B cells, CD3+ and CD8+ T cells, PNAd+, CD208+, CD21+ dendritic cells to confirm the hallmarks of a germinal centre.

Results: The developmental continuum of TLS formation was noted only via six-colour IHC for all markers that define a classical TLS and not solely

by evaluation of H&E stained section. Our pilot study investigating the presence and characteristics of TLS in bladder cancer patients is the first to demonstrate that well-formed TLS are more common in T2HG tumours compared to TaLG tumours.

Conclusions: These findings are suggestive of B cell-mediated immune responses in bladder cancer progression. An in-depth evaluation of the role of B cells will potentially reveal novel information on neo-epitopes that are seen by the B cells in bladder cancer.

Reference:

1. Kroeger DR, Milne K, Nelson BH. Tumour-infiltrating plasma cells are associated with tertiary lymphoid structures, cytolytic T-cell responses, and superior prognosis in ovarian cancer. *Clin Cancer Res* 2016;22:3005-15. https://doi.org/10.1158/1078-0432.CCR-15-2762

MP-07.08

Development of non-invasive, urine-based inflammatory test for prostate cancer

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Introduction: Chronic inflammation is a potential causal factor for prostate cancer (PCa);[1] however, a non-invasive test assessing prostatic inflammation is inexistent. The aim of this project is to develop a non-invasive, urine-based test to measure prostatic inflammation and stratify risk of PCa progression.

Methods: Digital rectal examination (DRE) urine samples and prostate biopsies from 120 low-grade PCa patients who chose active surveillance and participated in a randomized clinical trial testing long-chain omega-3 fatty acid (LCn3)-rich diet intervention vs. standard of care (SOC) were collected at baseline (V0) and after six months (V6). Fatty acid profiles of prostate biopsies were analyzed using capillary gas-liquid chromatography. Based on LCn3 incorporation after six months, we selected 10 best-responder patients and 10 non-responders (i.e., low LCn3 incorporation) of LCn3 group, as well as 10 control patients from SOC group for discovery proteomics analysis. A total of 60 DRE-urine samples (30 patients-V0, V6) were analyzed by label-free quantification (LFQ) optimized protocol using Orbitrap Fusion mass spectrometry.

Results: 600–700 proteins were identified in each DRE urine sample. Using paired t-test ($p<0.05$), six proteins were upregulated over time in LCn3 best-responders, including tumour necrosis factor receptor superfamily member 19L (RELT). In the same group, 28 proteins were downregulated, including immune response-associated proteins PTPRJ, PTGDS, TGFBR2, C4B, S100A8, and S100A9. Interestingly, only PTGDS out of these six candidates were also downregulated in LCn3 non-responders. Conversely, none of these proteins were modulated in SOC group.

Conclusions: Our study shows that DRE-urine can be used to develop a non-invasive inflammatory test for PCa. After validation of identified biomarkers in the entire cohort by targeted multiple reaction monitoring (MRM) mass spectrometry, this assay could be translated into a clinic to measure prostatic inflammation and stratify risk of PCa.

Reference:

1. Sfanos, Karen S, De Marzo AM. Prostate cancer and inflammation: The evidence. *Histopathol* 2012;60:199-215. https://doi.org/10.1111/j.1365-2559.2011.04033.x

Poster Session 8: GU Oncology 2
June 26, 2017; 0800–0930

IPD-08.01
The natural history of observed large renal masses

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Introduction: The natural history of small renal masses (T1a) has been well-defined, leading to active surveillance being a viable option for the management of such masses in the elderly. Less clear, however, is the management of larger masses. The objectives of this study is to define the natural history, including the growth rates and metastatic risk, of large (>4 cm) renal masses.

Methods: We performed a search of the imaging database at our centre for renal masses between 2005 and 2016. Renal masses concerning for renal cell carcinoma by imaging measuring >4 cm with at least two cross-sectional imaging studies >6 months apart were included. The 3-D measurements were performed by one radiologist. A retrospective chart review was conducted. Growth rates of the maximal tumour dimension were calculated. 95% confidence intervals (CI) using t-test were completed. Metastatic rates, cancer-specific and overall mortality were also evaluated.

Results: 69 patients met the inclusion criteria. Mean age at study entry was 75.5 years, mean estimated glomerular filtration rate (eGFR) was 57.5 ml/min/1.73m^2. Mean tumour maximal dimension at study entry was 5.6 cm and mean followup was 2.5 years. 46 patients did not develop metastasis during the followup period and showed a growth rate of 0.67 cm/year (95% CI 0.34 cm/yr–1 cm/yr). 15 patients (22%) developed metastasis during followup, with a mean tumour growth rate of 0.98 cm/year (95% CI 0.33 cm/yr–1.63 cm/yr). Seven patients had metastasis at presentation and showed a growth rate of 1.47 cm/year (95% CI 0.37 cm/yr–2.57 cm/yr). 17 (25%) patients died of metastatic renal cell carcinoma (RCC), 17 (25%) died of other causes. Overall and cancer-specific survival were 50% and 75%, respectively.

Conclusions: Large renal masses have a higher growth rate than that reported for small renal masses. There is a tendency for incresed growth rates in those who develop metastasis. Cancer-specific survival was 75% at a mean followup of 2.5 years.

IPD-08.02
Platelet to white blood cell ratio predicts 30-day postoperative infectious complications in patients undergoing radical nephrectomy for renal malignancy

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Introduction: The systemic inflammatory response may be involved in kidney cancer progression and kidney tumour cell biology, and may have utility as a prognostic biomarker in renal cell carcinoma (RCC).[1,2] We sought to examine the relationship between preoperative platelet to white blood cell ratio (PLT/WBC), a hematological marker of the systemic inflammatory response, and postoperative infectious complications following radical nephrectomy for localized RCC.

Methods: We performed a retrospective cohort study of patients treated with radical nephrectomy for localized kidney cancer between January 1, 2005 and December 31, 2014 (n=6235) using the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) database. Univariate and multivariate analyses were used to assess the association between PLT/WBC ratio and 30-day infectious complications, including surgical site infection, urinary tract infection (UTI), pneumonia, and sepsis. Secondarily, we examined major complications and bleeding requiring transfusion.

Results: A lower PLT/WBC ratio was associated with an increased risk of sepsis, pneumonia, and UTI rates ($p<0.05$ for all). Furthermore, there was a significant trend of decreasing rates of sepsis and pneumonia with increasing PLT/WBC ratios, across quintiles ($p<0.05$ for all). On multivariate analysis, patients with the lowest PLT/WBC ratios (quintile 1) had approximately a two-fold risk of having a postoperative infectious complication compared to patients in the highest quintile (odds ratio [OR] 1.88; 95% confidence interval [CI] 1.33 – 2.66; $p<0.0001$). Patients in quintile 5 had a higher risk of requiring blood transfusion than quintiles 2–4 ($p<0.01$ for all).

Conclusions: The PLT/WBC ratio represents a widely available and novel index to predict risk of infectious and bleeding complications in patients undergoing radical nephrectomy. External validation is required and the biological underpinning of this phenomenon requires further study.

References:

1. Roxburgh CS, McMillan DC. Role of systemic inflammatory response in predicting survival in patients with primary operable cancer. *Future Oncol* 2010;6:149-63. https://doi.org/10.2217/fon.09.136
2. Ramsey S, Lamb GW, Aitchison M, et al. Evaluation of an inflammation-based prognostic score in patients with metastatic renal cancer. *Cancer* 2007;109:205-12. https://doi.org/10.1002/cncr.22400

IPD-08.03
Cystic renal masses: Is the Bosniak classification system an adequate predictor of survival?

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Introduction: We evaluate intervention rates and survival outcomes of complex renal cysts in a single-centre experience.

Methods: We used a data-mining system (Montage; Montage Healthcare Systems, Philadelphia, PA, U.S.) to retrospectively review the radiology database in an academic health centre between 2001 and 2013 to identify all cases of "complex cyst." Primary endpoints were overall mortality (OM) and cancer-specific mortality (CSM).

Results: 248 patients were identified using the Montage system to have radiographic reports of complex renal cysts. Of these, 141 (56.9%), 86 (34.7%), and 21 (8.4%) had Bosniak 2F, 3, and 4 cysts, respectively. Median followup was 66.1 months. Of the 244 patients with followup, there were no cancer-specific deaths and OM was 7.4%. 20 patients underwent percutaneous biopsy of a solid nodule within the cyst; seven (35%) were found to have renal cell carcinoma With regards to intervention, six (4.3%), 31 (36.0%), and 13 (61.9%) of the Bosniak 2F, 3, and 4 patients underwent either surgical or ablative intervention, respectively. Indication for intervention was predominantly younger age. Median time to intervention was 6.45 months. Radical (17 patients, 34%) or partial nephrectomy (30 patients, 60%) was the predominant intervention, while three patients (6%) underwent ablation. Four patients (8.5%) had benign pathology, the remainder

had RCC: 23 (48.9%) clear cell, 10 (21.2%) multilocular cystic, seven (14.9%) papillary type 1, three (6.4%) papillary type II, and one (2.1%) tubulocystic. The majority (95.1%) were Fuhrman Grade 1 or 2. Even when excluding patients undergoing intervention, cancer-specific survival remained 100%.

Conclusions: CSM and OM for patients diagnosed with Bosniak 2F–4 complex renal cysts remains quite low; there were no cancer-specific deaths, even in the group that received no intervention. Reconsideration of management guidelines for complex renal cysts based on Bosniak classification system is warranted, particularly for Bosniak 3 cysts.

IPD-08.04

Is tumour location in upper tract urothelial carcinoma an important prognostic factor?

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Introduction: Upper tract urothelial carcinoma (UTUC) accounts for <5% of all urothelial cancers (UC). There is controversy regarding the importance of tumour location (renal pelvis vs. ureteral) in UTUC as a predictor of cancer-specific survival (CSS). Our objective was to evaluate the role of tumour location in CSS of de novo UTUC.

Methods: The Surveillance, Epidemiology, and End Results (SEER) database was queried for all patients with UTUC from 1988–2013. Data collected consisted of demographic and clinical parameters, including tumour location. In addition, complete pathological, followup and survival data were assessed. Patients were stratified according to their tumour location and compared for CSS in univariate and multivariate analyses.

Results: This cohort included 20 407 patients with UTUC. For this analysis, we eliminated patients who had secondary UTUC (after urothelial bladder cancer [UBC]), thus only de novo UTUC (dNUTUC) were analyzed (n=15 298). This was done to exclude the effects of primary UBC on CSS in these patients. Table 1 presents the demographic, pathological, and median followup data. Renal pelvic tumours constitute almost 65% of dNUTUC tumours and on average are larger and more advanced. Interestingly, over 46% in both tumour groups developed UBC later on. In terms of survival data (Table 2), covariates associated with diminished CSS include: increasing age, grade, TNM stage, and renal pelvic tumour (vs. ureteral), while undergoing a nephroureterectomy confers a protective effect on CSS.

Conclusions: These data suggest that tumours located at the renal pelvis in dNUTUC are more common, larger, and are more advanced at presentation, with a worse CSS than ureteral tumours.

IPD-08.04. Table 1. Demographic, clinical, and pathological data

	Renal pelvis	Ureter	p
Number of patients (%)	9925 (64.9%)	5373 (35.1%)	
Mean age (SD)	71.3 (11.8)	72.5 (10.6	<0.001
Patients <50 years of age (%)	5.5%	3.2%	<0.001
Race (%)			
White	80.7%	81.6%	
Black	5.3%	3.7%	<0.001
Other	14%	14.7%	
Gender (%)			
Male	56%	59.6%	<0.001
Female	44%	44.4%	
Mean tumour size (cm) (SD)	4.4 (2.43)	3.4 (2.32)	<0.001
Laterality (%)			
Right	49.8%	50.5%	
Left	50.1%	49.3%	0.465
Bilateral	0.1%	0.2%	
Type of surgery (%)			
No surgery	10.9%	9.7%	
Local/endoscopic	4.9%	24.8%	
Ureterectomy	0%	60.6%	<0.001
Nephroureterectomy	84.2%	5%	
Pathological grade (%)			
Well-differentiated	4.9%	6.7%	
Moderately differentiated	22.8%	22.3%	
Poorly differentiated	38.1%	37.4%	<0.001
Undifferentiated/anaplastic	34.3%	33.6%	
T stage (%)			
TX	12.8%	13.1%	
T0	0.1%	0%	
T1	24.7%	26.9%	
T2	19.9%	35%	<0.001
T3	29.3%	16.7%	
T4	13.3%	8.3%	
N stage (%)			
NX	27.1%	26.3%	
N0	58.2%	64.7%	
N1	6.9%	4.4%	<0.001
N2	5.2%	2.9%	
N3	2.6%	1.7%	
M stage (%)			
MX	40.7%	42.7%	
M0	46.8%	49.1%	<0.001
M1	12.6%	8.2%	
Median followup time (months) (IQR)	24 (8–70)	27 (10–66)	0.465
Status at last followup (%)			
Alive	33%	32.4%	
Dead of disease	27.5%	19%	<0.001
Dead of other causes	39.5%	48.6%	
Percentage of patients developing bladder cancer (%)	46.9%	46.7%	0.639

IQR: interquartile range; SD: standard deviation.

IPD-08.05

Correlation of transperineal prostate biopsy-detected cancer with magnetic resonance imaging-predicted lesion in patients with previous negative transrectal ultrasound-guided prostate biopsies

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Introduction: Transrectal ultrasound-guided (TRUS) prostate biopsies are offered to patients with suspected prostate cancer (PCa) and false-negative rates are around 2–20%.[1] Magnetic resonance imaging (MRI) is also said to have excellent sensitivity for PCa with Gleason score of 7 or more.[2] MRI scan of the prostate is recommended to avoid unnecessary repeat prostate biopsies; however, for repeat transperineal template prostate biopsy (TPB), diagnostic yield is reported to be around 38%.[2] Our aim was to review all patients undergoing TPB at our institution to assess correlation between the location of tumours on MRI and at template biopsy.

Methods: Our study cohort comprised of all patients at our institution who underwent TPB between January 1, 2013 and December 31, 2016. Data was collected from prospectively maintained urology multidisciplinary meeting (MDT) database and electronic patient records.

Results: There were 77 patients who met the study criteria; median age was 66 years (43–81) years and median prostate-specific antigen (PSA) 9.6

IPD-08.04. Table 2. Multivariate Cox proportional hazard analysis predicting disease-specific mortality in de novo UTUC

	Disease-specific mortality			
	p	HR	95 % CI for HR	
			Lower	Upper
Sex				
Female		Reference		
Male	0.985	0.999	0.860	1.160
Race				
White	Reference			
Black	0.648	0.913	0.618	1.350
Other	0.206	0.863	0.687	1.084
Age at diagnosis	<0.001	1.032	1.024	1.039
Tumour location				
Ureter		Reference		
Renal pelvis	0.004	1.315	1.094	1.581
Surgery type				
Ureterectomy		Reference		
No surgery	0.150	1.412	0.883	2.258
Endoscopic therapy	0.569	0.880	0.567	1.366
Nephroureterectomy	0.040	0.688	0.482	0.984
Grade	<0.001	1.577	1.421	1.749
T stage				
T0		Reference		
T1	<0.001	2.507	1.805	3.483
T2	<0.001	3.465	2.452	4.896
T3	<0.001	6.779	4.741	9.692
T4	<0.001	2.489	1.557	3.979
TX	<0.001	2.507	1.805	3.483
N stage				
N0		Reference		
N1	<0.001	2.878	1.821	4.549
N2	0.001	2.045	1.347	3.103
N3	<0.001	2.355	1.699	3.265
NX	0.539	1.075	.853	1.355
M stage				
M0		Reference		
M1	<0.001	7.128	4.818	10.545

CI: confidence interval; HR: hazard ratio; UTUC: upper tract urothelial carcinoma.

ug/L (0.7–33.9). PCa was detected in 43 (56%), and 34 (82%) patients had Gleason score ≥7 lesions. PIRADS 4/5 lesion was seen in 35 (47%), and 25 (71%) of these had concordance with biopsy results. Overall, location concordance with MRI findings was seen in 21 (28%) and discordance was due to benign histology in 28 (38%). Patients with proven PCa had 60% concordance with MRI.

Conclusions: Our study has shown that there is low concordance with MRI prostate and transperineal biopsies in patients with prior benign prostate biopsy. MRI pelvis can help in planning transperineal prostate biopsies and targeted biopsies are not safe for repeat biopsies.

References:

1. National Institute for Health and Care Excellence. Prostate cancer: Diagnosis and treatment. Clinical guideline. Published January 2014. Available at https://www.nice.org.uk/guidance/cg175. Accessed April 20, 2017.
2. Mottet N, Bellmunt J, Briers E, et al. *European Association of Urology guidelines on prostate cancer* 2015. Available at https://uroweb.org/wp-content/uploads/09-Prostate-Cancer_LR.pdf. Accessed April 20, 2017.

MP-08.01

Contemporary cost-consequences analysis of blue light cystoscopy with hexaminolevulinate in non-muscle invasive bladder cancer (CUA prize winner)

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Introduction: Previous studies have suggested cost-savings utilizing blue light cystoscopy (BLC) with hexaminolevulinate (HAL) compared to white light cystoscopy (WLC) during TURBT for NMIBC. However, these studies have utilized 'best case scenario' recurrence rate probabilities, thus decreasing generalizability of the findings. The objective of this study was to perform a contemporary cost-consequences assessment of BLC compared to WLC for TURBT.

Methods: A decision and cost-consequences model with a 5-year time horizon following initial TURBT was utilized. Literature review was performed to obtain contemporary recurrence and progression rates, which were meta-analyzed. Cost variables included in the model were from three large Canadian bladder cancer centres.

Results: The 5-year amortized cost of using BLC with HAL on all incident NMIBC compared to WLC was $4,832,908 for Ontario (n=4,696; $1,372/patient), $1,168,968 for British Columbia (n=1,204; $1,295/patient) and $2,484,872 (n=2,680; $1,236/patient) for Quebec. This would result in 87-338 fewer recurrences. On scenario analyses for Ontario data, if BLC with HAL were only used for cystoscopically appearing aggressive tumours, the 5-year cost would be $3,874,098, with a cost per patient of $1,222. If there was a 20% or 50% improvement in progression rates with BLC plus HAL, the 5-year cost would be $2,660,529 and -$598,039 (cost saving), respectively.

Conclusions: TURBT using BLC with HAL incurs a 5-year cost of ~$1-5 million for provinces of 4-13 million people. BLC with HAL improves patients care, reduces recurrences, and decreases hospital beds after TURBT. If this procedure eventually improves progression rates, there would be considerably improved cost-savings.

MP-08.02

The value of complementing administrative data with abstracted information on smoking and obesity: A study in kidney cancer (CUA prize winner)

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Introduction: Variables such as smoking and obesity are rarely available in administrative databases. We explored the added value of including these data in an administrative database study evaluating the association of statin use with survival in kidney cancer.

Methods: We linked administrative data with chart abstracted data on smoking and obesity for 808 patients undergoing nephrectomy for kidney cancer. Base models consisted of variables from administrative databases (age, sex, year of surgery, and different measures of comorbidity [to com-

pare their sensitivity to smoking and obesity data]); extended models added chart abstracted data. We compared coefficients for statin use with overall (OS) and cancer-specific survival (CSS), and used the c-statistic and net reclassification improvement (NRI) to compare predications of 5-year survival obtained from Cox proportional hazard models.
Results: The coefficient for statin use changed minimally following addition of abstracted data (<6% for OS, <2% for CSS). Base models performed similarly for OS, with c-statistics of 0.75 (95% CI 0.72 to 0.79) for Charlson score and 0.73 (95% CI 0.69 to 0.78) for John Hopkins Aggregated Diagnosis Groups score. After including abstracted data, c-statistics modestly improved (change <0.02); CSS demonstrated similar findings. NRIs were 0.210 (95% CI 0.062 to 0.297) and 0.186 (-0.031 to 0.387) when using the Charlson score, and 0.207 (0.068 to 0.287) and 0.197 (0.007 to 0.399) when using the Aggregated Diagnosis Groups score, for OS and CSS, respectively.
Conclusions: The inclusion of data on smoking and obesity marginally influences survival models in kidney cancer studies using administrative data.

MP-08.03
Radical cystectomy after prior partial cystectomy for urothelial carcinoma: Perioperative and oncological outcomes
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Introduction: Approximately 20% of patients treated with partial cystectomy (PC) have been reported to require radical cystectomy (RC) for disease recurrence. The outcomes for these patients have not been well-described to date. We therefore evaluated outcomes of patients undergoing RC after PC for urothelial carcinoma (UC).
Methods: We identified 61 patients who underwent RC at our institution after prior PC for UC from 1980–2010. These patients were then matched 1:3 to patients undergoing primary RC based on age, pathologic T and N stage, and decade of surgery. Perioperative outcomes were compared between groups using descriptive statistics. Cancer-specific (CSS) and overall survival (OS) were evaluated using the Kaplan-Meier method and Cox proportional hazards regression.
Results: Median age at the time of RC was 67 years in both groups (interquartile range [IQR] 62, 75). Median time from PC to RC was 1.5 years (IQR 0.6, 4.4). Estimated blood loss was higher among patients undergoing RC after PC compared to primary RC (median 1000 cc vs. 700 cc; p=0.001), although there was no difference in operative time (median 322 min vs. 292 min; p=0.17), length of stay (median 10 vs. 11 days; p=0.27), or perioperative complications (59% vs. 53%; p=0.63). Median followup after RC was six years, during which time 204 patients died, including 95 who died of UC. Five-year CSS was significantly worse for patients who underwent RC after PC vs. primary RC (58% vs. 67%; hazard ratio [HR] 1.8; 95% confidence interval [CI] 1.1, 3.0; p=0.02), while no difference in five-year OS was noted (51% vs. 54%; HR 1.2; 95% CI 0.8, 1.7; p=0.42).
Conclusions: Patients who undergo RC for recurrent UC after prior PC have similar perioperative outcomes to stage-matched patients undergoing primary RC; however, such patients may be at a higher risk of subsequently dying from UC. These data may be used in counselling patients considering PC as initial treatment for invasive UC, as well as for consideration of adjuvant therapy after RC following PC.

MP-08.04
Trends in radical prostatectomy practice at The Ottawa Hospital
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Introduction: Management of prostate cancer has changed over the last decade, with guidelines recommending against screening and advocating for active surveillance for lower-risk tumours. Our study examines characteristics of patients receiving radical prostatectomy at The Ottawa Hospital. We hypothesized that an increased proportion of patients who receive radical prostatectomy have intermediate- and high-risk disease.
Methods: We queried our prostate cancer community of practices' prospectively maintained database for all patients receiving surgery between 2008 and 2015 at The Ottawa Hospital. Year-by-year trends in clinical (biopsy findings, clinical stage, prostate-specific antigen [PSA] level, National Comprehensive Cancer Network risk group [NCCN]) and pathological characteristics (Gleason score, pathological stage) were examined. Complete clinical and pathological data were available from 2011–2015 and 2008–2015, respectively.
Results: A total of 1528 prostatectomy patients were identified (mean 191/year). The mean preoperative PSA was 9.74 ng/ml (range 1–250) and the median age was 63 years (range 41–79). The proportion of patients with NCCN high-risk disease increased from 13.5% in 2011 to 20.43% in 2015 and the proportion of low-risk cases decreased from 16.4% in 2011 to 8.1% in 2015. The proportion of patients with Gleason ≥7 on prostatectomy increased from 62.7% in 2008 to 93.7% in 2015. The proportion of patients with pathologic T3 disease increased from 30.6% in 2008 to 47.7% in 2015.
Conclusions: Over the last eight years, there has been a dramatic change in the tumour characteristics of patients receiving prostatectomy in our region, with almost all patients in recent years having significant disease based on pathological grade and stage. These data suggest that overtreatment has decreased possibly due to a change in patient selection for surgery.

MP-08.05
Proteomic identification of therapeutic targets for enzalutamide resistance in castration resistant prostate cancer
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Introduction: Prostate cancer (PCa) is the most frequently diagnosed cancer in Canadian men and is the third leading cause of cancer mortality. The androgen receptor (AR) is activated by androgens (e.g., testosterone), which leads to prostatic cell proliferation. The primary treatment for advanced PCa is androgen-deprivation therapy (ADT), which is achieved via surgical or chemical castration. Nevertheless, most PCa will become castration-resistant (CRPC). Although new anti-androgens (e.g., enzalutamide) were developed to improve patients' survival, their efficacy is still very limited and most CRPC patients will die from the disease within a few years. We postulate that by gaining insights into AR signalling networks in the context of enzalutamide growth inhibition, we could identify proteins involved in resistance.
Methods: We took advantage of an innovative proteomics approach, namely proximity-labeling (BioID), to characterize global AR signalling networks in hormone-dependant LAPC4 cells treated or not with dihydrotestosterone (DHT) or enzalutamide.

Results: We identified 45 AR-associated proteins in non-stimulated cells, 35 of which were not previously reported. Upon androgenic stimulation, the AR signalling network increased to 320 proteins, including 278 (253 were novel) that were restricted to androgen-stimulated cells. Enzalutamide treatment resulted in a loss of 259 proteins from the network when compared to stimulated cells. As expected, this reproduced quite faithfully the status of non-stimulated LAPC4 cells. Interestingly, we identified four proteins in the AR network only after enzalutamide treatment.
Conclusions: We have identified AR network proteins involved specifically in enzalutamide-treated PCa cells. These might be key regulators for enzalutamide growth inhibition and may be relevant for the acquisition or the prediction of enzalutamide resistance.

MP-08.06

Adjuvant sunitinib in patients with high risk renal cell carcinoma: Subgroup analyses from S-TRAC trial

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Study Groups: The study was funded by Pfizer Inc.
Introduction: Adjuvant sunitinib (SU; 50 mg daily, schedule 4/2) significantly improved disease-free survival (DFS) vs. placebo (PBO) in patients (pts) with locoregional renal cell carcinoma (RCC) at high risk of tumour recurrence after nephrectomy (hazard ratio [HR], 0.76; 95% confidence interval [CI], 0.59–0.98; P=0.03, median: 6.8 vs. 5.6 years). We provide data on the study population, treatment, pattern of recurrence, and the relationship between baseline factors and DFS (blinded independent central review).
Methods: Disease recurrence was based on centrally confirmed imaging and/or histological findings. Subgroup analyses of DFS by baseline risk factors were conducted using a Cox Proportional hazards model. The baseline risk factors explored included modified UISS criteria, age, gender, Eastern Cooperative Oncology Group performance status (ECOG PS), weight, neutrophil-to-lymphocyte ratio (NLR), and Fuhrman grade.
Results: 615 pts were enrolled in S-TRAC trial from 97 sites. >70% of patients received SU treatment for ≥6 cycles (~8 months) and 56% completed the full 1-year treatment. A total of 97 patients (31.4%) in the SU arm and 122 (39.9%) in the PBO arm developed metastatic disease recurrence. Most common sites of distant recurrence (SU:PBO) were lung (13%:16%), lymph node (7%:9%), and liver (4%:5%). The benefit of adjuvant SU over PBO was observed across several subgroups of pts, including: higher risk than the overall study population (HR 0.74; 95% CI, 0.55–0.99; P=0.04); ECOG PS 0 (HR 0.69; 95% CI, 0.51–0.93; P=0.01); Fuhrman grade 3/4 (HR 0.73; 95% CI, 0.55–0.98; P=0.04); and NLR ≤3 (HR 0.72; 95% CI, 0.54–0.95; P=0.02).
Conclusions: The majority of subgroups demonstrated longer DFS with adjuvant SU compared with PBO. These results are consistent with the primary analysis showing benefit for adjuvant SU in pts at high risk for recurrent RCC post nephrectomy.

MP-08.07

Impact of lower castrate-level testosterone on progression to castrate-resistant prostate cancer for patients undergoing continuous androgen-deprivation therapy: A prospective cohort study

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Introduction: We investigated whether lower testosterone threshold compared to traditionally accepted level of castrate-level testosterone (<1.7 nmol/L) has an impact on time to progression to castrate-resistant prostate cancer (CRPC) in patients undergoing continuous androgen-deprivation therapy (ADT).
Methods: A single-centre, prospective review of 153 consecutive patients undergoing continuous ADT from 2006–2016 was performed. Patients were excluded from the analysis if they received ADT concurrently with external beam radiation therapy or did not achieve castrate-level testosterone (<1.7 nmol/L). Serum testosterone was measured every three months after initiation of ADT. Patients were subcategorized based on their one-year mean testosterone value (<0.7 nmol/L, 0.7–1.1 nmol/L, 1.1–1.7 nmol/L, >1.7 nmol/L) and outcome measures were compared. Progression to CRPC was assessed with the Kaplan-Meier method. Statistical analysis was performed using the log-rank, Breslow, and Tarone-Ware tests to compare the groups.
Results: A total of 112 patients were included in the analysis. Median age at diagnosis was 67.9 years (range 50.9–89.1). Median followup was 27.9 months (range 3.3–114.6). Median prostate-specific antigen (PSA) prior to initiation of ADT was 18 ng/mL (range 0.61–2940). 72.3% of patients achieved a one-year mean T <0.7 nmol/L; 18.6% achieved between 0.7–1.1 nmol/L; 5.4% between 1.1–1.7 nmol/L; and 3.6% achieved >1.7 nmol/L. There was no statistically significant difference in progression-free survival between patients with different levels of one-year mean testosterone values (log-rank p=0.813). The Kaplan-Meier curve is shown in Fig. 1.
Conclusions: Our results suggest there may not be a significant impact of strict testosterone control beyond what is considered traditionally castrate-level testosterone; however, only a small proportion of patients had one-year testosterone >1.1 nmol/L (9.0%). A larger study may reveal a beneficial role of strict testosterone reduction in the management of advanced prostate cancer.

MP-08.08

Population-based analysis of treatment toxicity among men with castration-resistant prostate cancer

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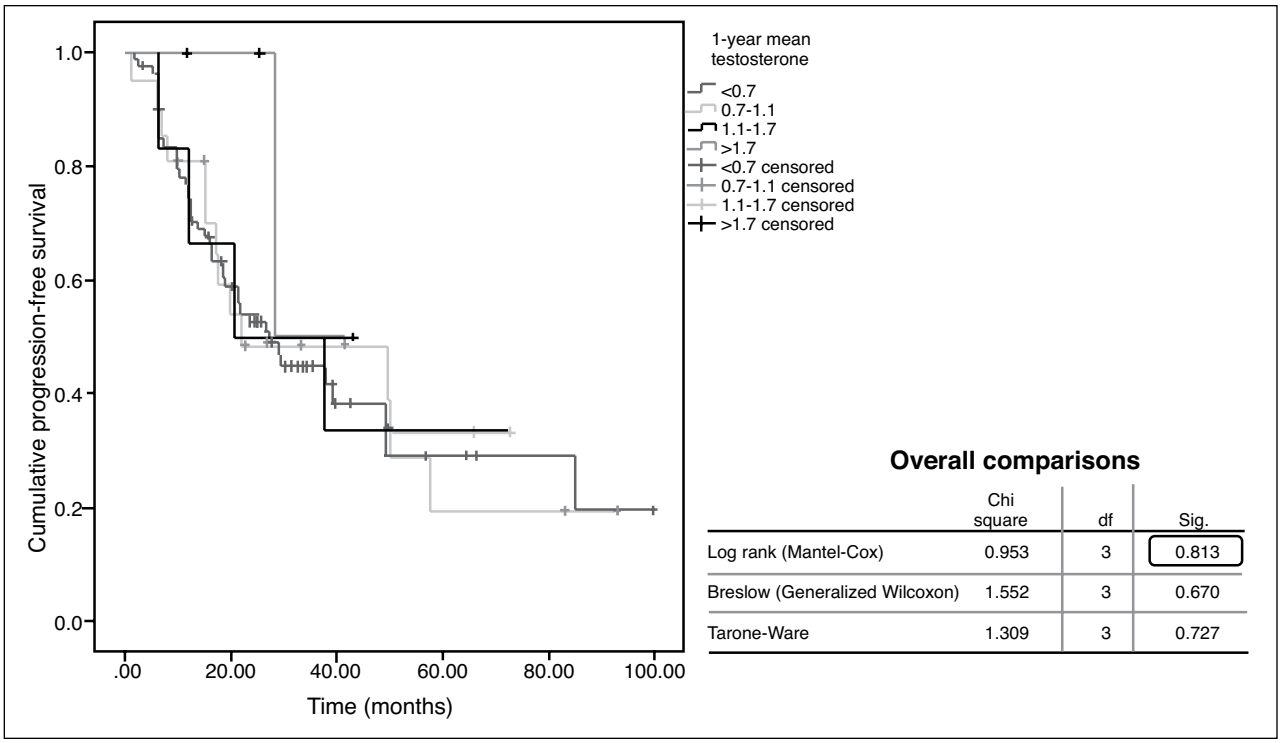
Introduction: The toxicity and effectiveness of contemporary metastatic castrate-resistant prostate cancer (mCRPC) treatments have not been assessed at a population level. We examined rates of hospitalizations and emergency room (ER) visits and survival among men with mCRPC treated with abiraterone, enzalutamide, docetaxel, or cabazitaxel.
Methods: We performed a phase 4, population-based, retrospective, cohort study of 2439 men aged 65 years and older receiving mCRPC treatment with abiraterone, enzalutamide, docetaxel, or cabazitaxel from



Overall comparisons

	Chi square	df	Sig.
Log rank (Mantel-Cox)	0.953	3	0.813
Breslow (Generalized Wilcoxon)	1.552	3	0.670
Tarone-Ware	1.309	3	0.727

Fig. 1. MP-08.07. Cumulative progression-free survival of patients undergoing continuous androgen deprivation based on one-year mean testosterone level.

2003–2015 in Ontario, Canada. Outcomes were toxicity (hospitalizations and ER visits) and overall survival from the date of first mCRPC prescription. We calculated hazard ratios (HRs) using multivariable Cox proportional hazards models with time-varying exposures.
Results: Docetaxel exposure was associated with a significantly increased risk of any-cause (HR 1.3; 95% confidence interval [CI] 1.2–1.4) and treatment-related (HR 1.5; 95% CI 1.3–1.7) toxicity. Cabazitaxel exposure was associated with a significant risk of treatment-related (HR 5.9; 95% CI 1.9–18.9), but not any-cause (HR 2.4; 95% CI 0.6–9.6) toxicity. Abiraterone and enzalutamide exposure were not associated with any-cause (p=0.2 and 0.5, respectively) or treatment-related (p=0.5 and 0.6, respectively) toxicities. We found evidence of effect modification with an elevated risk of toxicity during abiraterone treatment among patients who had received chemotherapy first. Patients starting mCRPC treatment following the introduction of oral therapies had improved overall survival compared with those starting prior to their introduction (adjusted HR 0.7; 95% CI 0.6–0.8).
Conclusions: Among patients with mCRPC, treatment with docetaxel or cabazitaxel is associated with an increased risk of hospitalizations and ER visits. We failed to demonstrate an association with abiraterone or enzalutamide exposure, although the use of abiraterone following chemotherapy is associated with an increased risk of toxicity.

MP-08.09
Validation of a modified Gleason grading system in a Canadian cohort

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Introduction: Recently, a new Gleason grading system was reported, substratifying Gleason score into five categories, 6, 3 + 4, 4 + 3, 8 and 9–10. We sought to validate the new grading score on a Canadian cohort.
Methods: Analysis was realized on a prospectively maintained Canadian database of patients who underwent robot-assisted radical prostatectomy (RARP) between 2006 and 2016 at two major centres in Canada. Outcome was based on biochemical recurrence (BCR). The log rank test assessed univariable differences in BCR by Gleason score. Separate univariable and multivariable Cox proportional hazards used four possible categorizations of Gleason scores.
Results: Large differences in BCR rates between both Gleason 3 + 4 vs. 4 + 3 (p<0.001) were found. There was no statistical difference in BCR rates between Gleason 8 vs. 9–10 (p=0.342). The hazards ratios, on univariable analysis relative to Gleason score 6, were 1.531 (95% confidence interval [CI] 0.588; 3.987), 5.146 (95% CI 1.754; 15.098), 8.157 (95% CI 2.783; 23.911), and 11.7 (95% CI 3.585; 30.804) for Gleason scores 3 + 4, 4 + 3, 8, and 9–10, respectively (Fig. 1).
Conclusions: The new grading system has the benefits of being a more accurate grade stratification than current systems. The present study validates the difference that exists between 3 + 4 vs. 4 + 3 categories inside

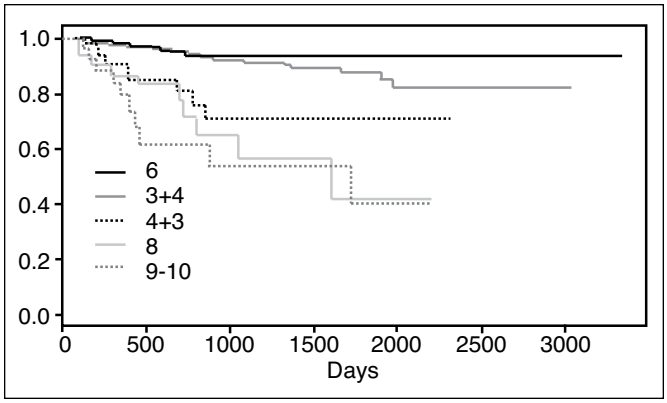

Fig. 1. MP-08.09. Differences in biochemical recurrence rates between Gleason scores.

the Gleason 7 group. This fact demonstrates the importance of the separation of the two categories in the new system. No difference was observed between Gleason 8 and 9–10 groups; this could be due to insufficient number of observation.

MP-08.10

Combining 4Kscore and magnetic resonance imaging for prostate biopsy decision-making

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Introduction: Multiparametric magnetic resonance imaging (mpMRI) and the 4Kscore blood test (OPKO: Miami FL) have both been shown to predict significant prostate cancer in men with elevated prostate-specific antigen (PSA); however, mpMRI is difficult to apply at a population level, and results from the PROMIS MRI trial show that 11% of men with normal MRI can harbour high-grade disease. One possibility is selective application of mpMRI to men at intermediate risk, as defined by the 4Kscore. The aim of this study was to evaluate mpMRI as a followup test to the 4Kscore in prostate cancer early detection.

Methods: 4Kscore results from the U.S. prospective validation study were combined with mpMRI data available from the PROMIS study. Using the likelihood ratios for MRI detecting high-grade disease and applying them to probabilities of 4Kscores, four different populations were identified based on a threshold for biopsy of 7.5% risk of high-grade disease: 1) men with very low 4Kscore for whom risk would not be ≥7.5% even with positive MRI; 2) men with 4Kscores <7.5% whose risk would be ≥7.5% if MRI were positive; 3) men with 4Kscores ≥7.5% whose risk would be <7.5% if MRI were negative; and 4) men with high 4Kscores whose risk would remain ≥7.5% even if MRI were negative. In this strategy, Group 1 would not be biopsied; Groups 2 and 3 would receive MRI and then biopsy if MRI was positive; Group 4 would be biopsied without MRI. Decision analysis was used to evaluate each strategy using the threshold of 7.5%.

Results: In the 4Kscore validation study, 1012 men underwent prostate biopsy, with 231 (23%) diagnosed with ≥ Gleason 7 disease. PROMIS gave a positive and negative likelihood ratio of 1.58 and 0.17 for MRI. The range of 4Kscores that could be influenced by the results of MRI was 5–32%, i.e. Group 1: 26% of the population with risk <5%; Group 2: 10% with risk 5–7.4%; Group 3: 45% with risk 7.5–32%; Group 4: 21% with risk >32%. Net benefit of using 4Kscores alone was 17.7%, mpMRI 17.6%, and combined strategy 18.2%. A difference of 0.5% between the combined strategy and 4Kscore alone is equivalent to 62 fewer biopsies per 1000 for the same number of high-grade cancers detected or about nine MRI per biopsy avoided. Results were similar using a 10% threshold.

Conclusions: Using mpMRI in the setting of low–intermediate range 4Kscores results in a biopsy strategy with higher net benefit compared to using either modality alone. The proposed risk stratification reduces the excessive rate of missed high-grade disease associated with use of mpMRI.

MP-08.11

The risk of urinary retention following robot-assisted radical prostatectomy and its impact on early continence outcomes

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Introduction: We sought to evaluate the risk factors of acute urinary retention (AUR) following robot-assisted radical prostatectomy (RARP), including the timing of catheter removal, and to study the relationship of urinary retention with early continence outcomes.

Methods: 740 consecutive RARPs by two experienced surgeons at our institute were reviewed retrospectively from a prospectively collected database. Table 1 shows baseline characteristics. Multiple factors, including age, body mass index (BMI), International Prostate Symptom Score (IPSS), prostate volume, presence of median lobe, nerve preservation, anastomosis time, and catheter removal time (Day 4 vs. 7) were evaluated as risk factors for AUR using univariate (Table 2) and multivariate (Table 3)

MP-08.11. Table 1. Baseline characteristics of overall cohort

Variables	Mean	CI
PSA	6.66	(6.32; 7.01)
Age (year)	60.44	(59.97; 60.90)
BMI	27.55	(27.23; 27.88)
Prostate volume (g)	50.22	(48.95; 51.50)
cStage % (n)		
cT1a	0.13 (1)	
cT1b	0.13 (1)	
cT1c	71.79 (532)	
cT2a	19.83 (147)	
cT2b	5.93 (44)	
cT2c	1.34 (10)	
cT3a	0.8 (6)	
Gleason biopsy % (n)		
6	34.10 (252)	
7	56.29 (416)	
8	73.07 (540	
9	23 (17)	
IPSS	7.60	(7.12; 8.07)
EBL	263.39	(252.13; 274.65)
OR time	183.26	(179.35; 187.18)

BMI: body mass index; EBL: estimated blood loss; IPSS: International Prostate Symptom Score; OR: operating room; PSA: prostate-specific antigen.

MP-08.11. Table 2. Univariate analysis of potential predictors of AUR

Variables	OR	CI	p
Catheter removal day	0.053	(0.003; 0.264)	0.004
Age (year)	0.933	(0.867; 1.004)	0.06
BMI	0.988	(0.872; 1.097)	0.839
Prostate volume (g)	0.986	(0.951; 1.015)	0.409
Anastomosis time	1.001	(0.946 ; 1.043)	0.963
IPSS	0.965	(0.877 ; 1.041)	0.405
Median lobe	1.210	(0.276; 3.784)	0.767
Nerve preservation	1.030	(0.546 ; 1.843)	0.922

AUR: acute urinary retention; BMI: body mass index; CI: confidence interval; IPSS: International Prostate Symptom Score; OR: odds ratio.

MP-08.11. Table 3. Multivariate analysis of potential predictors of AUR

Variables	OR	CI	p
Catheter removal day	0.940	(0.911; 0.971)	<0.001
Age (year)	0.998	(0.996; 1.001)	0.209
BMI	1.000	(0.996; 1.003)	0.904
IPSS	0.999	(0.997; 1.002)	0.520
Prostate volume (g)	1.000	(0.999; 1.001)	0.723
Anastomosis time	1.001	(1.000; 1.003)	0.103
Nerve preservation	1.000	(0.980; 1.021)	0.976
Median lobe	1.012	(0.970; 1.056)	0.587

AUR: acute urinary retention; BMI: body mass index; CI: confidence interval; IPSS: International Prostate Symptom Score; OR: odds ratio.

MP-08.11. Table 4. Urinary continence outcomes of 351 patients who had catheter removed at at 1 and 3 months following RARP

No of patients	0 pad	1 security pad	1 pad	2 or more pads	p
1 month					
AUR	14 (88%)	1 (6%)	1 (6%)	0	0.0142
No AUR	153 (47%)	68 (21%)	44(13%)	64 (19%)	
3 months					
AUR	15 (94%)	0	1 (6%)	0	0.201
No AUR	227 (70%)	50 (15%)	27 (8%)	25 (7%)	

AUR: acute urinary retention; RARP: robot-assisted radical prostatectomy.

analysis. The relation between AUR and early return of continence (one and three months) post-RARP was also evaluated (Table 4).

Results: The incidence of clinically significant vesicourethral anastomotic leak and AUR following catheter removal were 0.9% and 2.2% (17/740), respectively. In men who developed AUR, there was no significant relationship with regards to age, BMI, IPSS, prostatic volume, median lobe presence, nerve preservation, or anastomosis time. Moreover, the incidence of AUR was significantly higher (p=0.004) for men with catheter removal at Day 4 (4.5% [16/351]) vs. Day 7 (0.2% [1/289]). Moreover, patients with early removal of catheter (Day 4) whom developed AUR had earlier one-month return of 0-pad continence at 87.5% (14/16) compared to patients without AUR 45.6% (153/335), with no significant deference at three months.

Conclusions: While AUR is an uncommon complication of RARP, its incidence is much higher than vesicourethral anastomosis (VUA) leak and it is often not discussed during patient counselling. Early catheter removal at Day 4 post-RARP is associated with higher incidence of AUR. Moreover, men experiencing AUR were observed to have a much earlier return of urinary continence. Future studies are warranted to validate this novel impact on long-term outcome of continence.

MP-08.12

Current delays from biopsy to radical prostatectomy do not appear to affect pathological outcomes in low-, intermediate-, or high-risk disease

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Introduction: There is a small volume of varied literature reporting on the impact of time between prostate cancer diagnosis on biopsy and definitive intervention with radical prostatectomy with regards to adverse pathological outcomes. There are considerable, and in some cases increasing, delays in treatment for patients with prostate cancer in Canada's publically funded healthcare system. We sought to evaluate our institutional outcomes using a large multisurgeon database.

Methods: We retrospectively reviewed 2728 patients who underwent radical prostatectomy between 2005 and 2014. Patients were stratified according to biopsy Gleason grade groups and preoperative prostate-specific antigen (PSA) levels. Pathological outcomes were evaluated for patients with <2 months between biopsy and surgery and then at monthly intervals of up to six months. Adverse pathological outcomes were defined as Gleason upgrading from biopsy, the presence of extracapsular extension (pT3a) or seminal vesicle invasion (pT3b), positive surgical margins, and positive lymph node involvement. The x2 test was used for statistical analysis.

Results: 2310 patients met our inclusion criteria. Median time from biopsy to surgery was 83 days (range 61–109). Gleason grade groups 1, 2, 3, 4, and 5 comprised of 906 (39.2%), 1048 (45.4%), 231 (10%), 69 (3%), and 56 (2.4%), respectively. In total, 31.8% of patients were classified by Gleason grade on final surgical pathology. The overall positive surgical margin rates were 25% for organ-confined (pT2) disease and 49.8% patients with pT3 disease. Lymph node involvement was identified in 1.5% of patients. There was no observed difference in adverse pathological outcomes for patients in any risk category with delays of up to six months between biopsy and radical prostatectomy.

Conclusions: Surgical delays of up to six months following prostate biopsy were not associated with an increased risk of Gleason score upgrading, extracapsular extension, seminal vesicle invasion, positive surgical margins, or lymph node involvement.

MP-08.13

Renal functional outcomes in patients undergoing partial nephrectomy or percutaneous cryoablation for a solitary renal mass

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Introduction: There are conflicting data on renal functional outcomes when comparing partial nephrectomy (PN) and percutaneous cryoablation (CA). We therefore compared the changes in renal function between PN and CA patients with a solitary renal mass.

Methods: We identified all patients who underwent PN or CA for a solitary renal mass between 2003 and 2013 at a single institution. Estimated glomerular filtration rates (eGFR) were calculated at baseline, prior to discharge, and at three months' followup using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation. Multivariable linear regression was used to compare the change in renal function between groups controlling for clinical characteristics. Subgroup analyses were performed in patients with baseline stage 3 or 4 chronic kidney disease (CKD).

Results: There were 1650 PN and 481 CA identified, including 370 (22%) PN and 227 (47%) CA with stage 3 or 4 CKD. Overall, PN patients were younger (mean 59 vs. 69 years; p<0.001), had a higher baseline eGFR (74.6 vs. 62.7 ml/min/1.73m^2; p<0.001), and larger tumours (mean 3.5 vs. 3.1 cm; p=0.001) compared to CA patients. On multivariable analyses, mean changes in eGFR at discharge and at three-month followup for PN vs. CA were -1.2% vs. -4.6% (p=0.021) and -1.9 vs. -6.3% (p=0.003), respectively. Similar results were found in the subgroup of patients with baseline stage 3 or 4 CKD at both discharge (3.4 vs. -2.7%; p=0.009) and at three-month followup (1.1 vs. -4.1%; p=0.001), respectively. The rate of CKD stage progression from baseline to three-month followup was similar between the two groups in both the entire cohort (18% vs. 20%; p=0.43) and among patients with baseline stage 3 or 4 CKD (6% vs. 7%; p=0.62).

Conclusions: Neither PN or CA cause clinically significant changes in renal function, including among patients with pre-existing renal dysfunction. While we observed a greater decline in renal function when CA was compared with PN, the risk of CKD stage progression was similar between the two procedures.

MP-08.14

Retroperitoneal lymph node dissection in complex cases and high-volume residual tumours: How aggressive should we be?

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Introduction: Total resection of retroperitoneal residual tumour (RRT) after chemotherapy is crucial to achieving cure in patients with advanced testicular cancer. High-volume masses remain a surgical challenge for most urologists. We reviewed our surgical approach and perioperative outcomes in complex RRT.

Methods: We retrospectively reviewed the electronic charts of 42 patients who underwent post-chemotherapy retroperitoneal lymph node dissection (PC-RPLND) from 1996–2015.

Results: The mean age was 33.4 years ± 8. 97% were white. The primary cancer type was non-seminomatous germ cell tumour in 88% of the cases.

MP-08.14. Table 1. List of intraoperative and early postoperative complications

Intraoperative complications	Number of patients
IVC/Iliac vein tear	8
Aortic/iliac artery tear	6
Renal artery/vein injury	3
Intestinal serosa injury	5
Early postoperative complications	
Hemorrhagic anemia	2
DVT	1
Chylous leak	1
Wound dehiscence	1
Ileus	3
Renal infarction	1
Pneumothorax	1
Pneumonia	2
Compartment syndrome of lower limbs	1
Intra-abdominal infection	1

DVT: deep vein thrombosis; IVC: inferior vena cava.

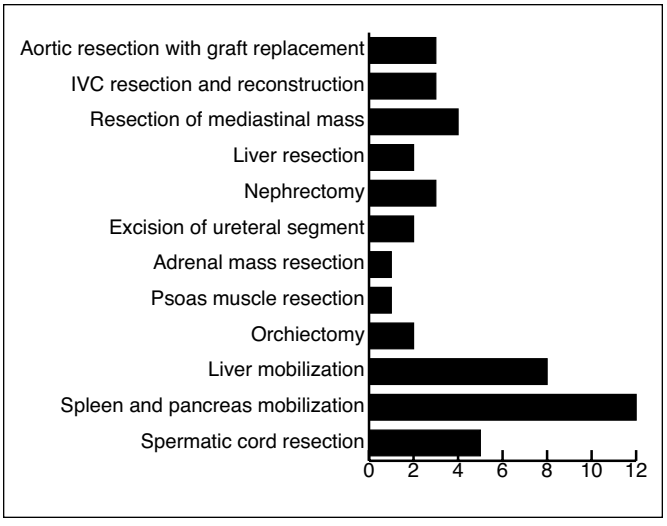

Fig. 2. MP-08.14. Adjunctive procedures performed during lymph node dissection.

The mean size of the RRT was 13 cm ± 7 (Fig. 1; available at https://cua.guide/). 62% of the RRT revealed teratoma. Six of them showed elements of yolk and embryonal carcinoma. The rest consisted of fibrosis. Four patients had simultaneous mediastinal masses, which were resected in the same settings. 33 patients (78.5%) had at least one adjunctive procedure during the operation (the adjunctive procedures are shown in Fig. 2). The operative time was 6.7 hours ± 2.2. Blood loss was 989 ml ± 220. Intraoperative and early postoperative complications are summarized in Table 1. Most of the intraoperative complications were related to the RRT attachments and all were repaired without any sequelae. Both the intraoperative and 30-day mortality rates were 0, while the 90-day mortality rate was 2%. The mean length of hospital stay was 8.6 days ± 4.5. The median followup time was 54 months, with four patients lost to followup. The relapse rate was 23.6%. The median time to relapse was 12 months.

Conclusions: Our data showed acceptable perioperative and oncological outcomes. PC-RPLND of extensive RRT requires aggressive surgical approach, usually with multisystem involvement. Therefore, it should be performed in specialized centres with high surgical expertise.

MP-08.15

Treatment patterns and trends of patients dying of prostate cancer in Quebec: A population-based study

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Introduction: The management of metastatic castration-resistant prostate cancer (mCRPC) has evolved considerably with the inclusion of docetaxel-based chemotherapy, bone-targeted therapies, and more recently, abiraterone for docetaxel-refractory patients. Our study aimed to analyze contemporary mCRPC management patterns and therapy use trends in Quebec, Canada.

Methods: The cohort included patients dying of prostate cancer (PCa) between January 2001 and December 2013 and selected from the public healthcare insurance databases, the Régie de l'Assurance Maladie du Québec (RAMQ), and Med-Echo databases. Patient selection was based on PCa-related death and/or therapy use according to the Canadian Urological Association guidelines. Multivariate logistic regression was used to identify factors associated with the probability of receiving chemotherapy, bone-targeted therapies, and palliative radiotherapy (RT) before death from PCa.

Results: Overall 3106 patients were identified in our cohort. The median age of death was 78 years old. Most (83%) received mCRPC-specific treatments: chemotherapy, abiraterone, palliative radiation therapy (RT), or bone-targeted therapy, while 17% of patients were managed only with maximum androgen blockade, despite diagnosis of PCa-related death. Logistic regression analyses indicate that patients dying after 2005 were more likely to have received chemotherapy (odds ratio [OR] 1.51; 95% confidence interval [CI] 1.22–1.85) and bone-targeted therapy (OR 1.97; 95% CI 1.64–2.37). Age was a significant predictor of use of chemotherapy, bone-targeted therapy, and palliative RT (ORs ranged from 0.96–0.98; $p<0.05$).

Conclusions: Patient age seems to be a strong determinant of chemotherapy, bone-targeted therapy, and palliative RT use. While chemotherapy is still used only in a minority of patients, the introduction of new therapies, such as bone-targeted therapy, docetaxel, and abiraterone, affected treatment selection over time.

MP-08.16

Urinary function after robotic-assisted laparoscopic vs. radical perineal prostatectomy for low-risk prostate cancer

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Introduction: Robotic-assisted laparoscopic prostatectomy (RALP) has largely replaced open radical prostatectomy in many markets. Radical perineal prostatectomy (RPP) is another less invasive alternative approach to open radical that has not been widely adopted. RPP offers excellent exposure of the urinary sphincter and bladder neck, yet surgeons differ on the ability to spare the cavernosal nerves. We evaluate the recovery of urinary function between RALP and RPP.

Methods: Retrospective review of a prospective radical prostatectomy database was performed. Urinary modules from the Expanded Prostate Cancer Index Composite-Urinary Function (EPIC-UF) questionnaire were used to determine preoperative baseline urinary symptom summary score and subscale scores of urinary incontinence, bother, irritative or obstructive symptoms, and function and six, 12, 18, and 24 months after surgery.

Results: 753 men underwent RALP (n=623) or RRP (n=130). There were no demographic or clinical differences between groups; however, a significantly higher number of patients undergoing RALP than RRP had pelvic lymph node dissection (20.2% vs. 0%; p<0.0001) and sparing of cavernosal neurovascular bundles (79.2% vs. 68.4%; p<0.0001). 508 patients had complete EPIC-UF data. Overall urinary symptom score recovery was greater for RALP than RPP at six months (p=0.028). Urinary incontinence and function were also more improved after RALP compared to RRP but only at six months (p=0.021, p=0.006). There were no differences in overall, urinary incontinence, or urinary function scores at 12, 18, or 24 months. There was no difference between RALP and RPP for urinary bother or irritative or obstructive symptoms at any time point (Table 1).

Conclusions: RALP had statistically significantly more rapid recovery of EPIC-UF data at six months vs. RPP, although clinical significance is unclear; however, at 12–24 months, RALP and RPP had similar recovery of urinary function in all urinary subdomains.

MP-08.16. Table 1. Changes in expanding prostate cancer index composite score

EPIC score	RALP	RPP	p
Overall			
Baseline	88.34	89.68	NS
6 months	81.53	78.07	0.028
12 months	84.68	83.73	NS
18 months	85.82	84.05	NS
24 months	86.13	85.46	NS
Urinary incontinence			
Baseline	92.24	92.89	NS
6 months	70.36	63.16	0.021
12 months	75.51	73.07	NS
18 months	77.25	74.83	NS
24 months	77.70	76.68	NS
Urinary function			
Baseline	93.95	94.29	NS
6 months	81.47	76.36	0.006
12 months	85.01	83.42	NS
18 months	85.97	84.15	NS
24 months	86.43	85.35	NS
Urinary bother			
Baseline	84.35	86.35	NS
6 months	81.61	79.33	NS
12 months	84.46	83.94	NS
18 months	85.72	83.96	NS
24 months	85.92	85.52	NS
Irritative/obstructive symptoms			
Baseline	87.28	87.18	NS
6 months	88.99	88.89	NS
12 months	90.74	90.64	NS
18 months	91.15	91.05	NS
24 months	91.50	91.40	NS

EPIC: Expanded Prostate Cancer Index Composite; NS: non-significant; RALP: robot-assisted laparoscopic prostatectomy; RPP: radical perineal prostatectomy.

MP-08.17

The prevalence and biopsychosocial predictors of suicidality in men with prostate cancer

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Study Groups: Ride for Dads, Prostate Cancer Canada.

Introduction: Prostate cancer (PCa) is associated with depression above levels reported in the general population. There is a positive association between PCa diagnosis and suicide.[1,2] The first aim of this study is to establish a point prevalence for suicidality among patients diagnosed with PCa. The second aim is to evaluate what biopsychosocial variables predict risk of suicidality in men with PCa.

Methods: Participants were recruited from the ambulatory PC urology clinics at Queen's University and through direct invitation from an online PCa support groups (Prostate Cancer Canada). All willing participants were directed to the online survey. Hierarchical regression was used to predict suicidality using biopsychosocial variables.

Results: At time of submission, 229 men began but 110 men completed the survey (48.3% response rate), with one participant removed due to missing data. 86 (77.5%) men were diagnosed with curative PCa and 24 (21.6%) with advanced PCa. The most common treatments received were prostatectomy (61.3%), radiotherapy (40.5%), and androgen-deprivation therapy (37.8%). In regard to suicidality, 18.9% were classified as at-risk cases using a general population cut-score, while 12.6% were classified as at-risk cases using an inpatient population cutoff. The regression analyses indicated that thwarted belongingness (b=0.45) was the strongest predictor of suicidality ($F[97, 2]=12.12$; $p<0.01$; adj $r^2=0.38$], with exposure to suicide (b=0.23) and emotional well-being (b =0.20) as other significant considerations. Cancer stage was not a significant predictor of suicide behaviours.

Conclusions: Although exposure to suicide and reduced emotional well-being were associated with greater suicidality, thwarted belongingness, or the extent to which individuals believe their need to belong is met/unmet, appears to be a more salient clinical target. Screening and identifying troublesome cognitive patterns in patients with PCa may be beneficial in reducing suicidality.

References:

1. Bennett G, Badger TA. Depression in men with prostate cancer. *Oncol Nurs Forum* 2005;32:545-56. https://doi.org/10.1188/05.ONF.545-556
2. Llorente MD, Burke M, Gregory GR, et al. Prostate cancer: A significant risk factor for late-life suicide. *Am J Geriatr Psychiatry* 2005;13:195-201. https://doi.org/10.1097/00019442-200503000-00004

MP-08.18

Body mass index correlates with higher grade and stage cancer, but not failure of radical prostatectomy in a prospective cohort of patients with localized prostate cancer in Quebec

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Introduction: It is disputed whether body mass index (BMI) of patients with localized prostate cancer (PCa) predicts PCa aggressiveness.[1-7] We analyzed data from a large cohort study to evaluate the correlation between BMI and PCa clinical and pathological parameters at the time of and after radical prostatectomy (RP).

Methods: Data was collected from the PROCURE Biobank, a prospective cohort of PCa patients who underwent RP in four academic centres in Quebec between 2007 and 2012. Baseline characteristics, treatment information, and post-RP outcome were collected via patient questionnaires, pathology reports, and medical chart review. Multivariate analysis of variance (MANOVA) was used to identify whether BMI is an independent predictor for PCa tumour grade and stage, and for positive surgical margins (PSM). Treatment failure, defined as detectable and increasing prostate-specific antigen (PSA) levels post-surgery or initiation of secondary (non-adjuvant) therapy, was analyzed using the Kaplan-Meier method and log-rank tests. Cox proportional hazards models were used to calculate hazard ratios (HR) and 95% confidence intervals (CI) for treatment failure after adjustment for covariates.

Results: Of 1988 included patients, 878 (50.6%) were overweight (BMI 25.0–29.9), 321 (18.5%) obese (BMI 30.0–39.9), and 12 (0.7%) morbid obese (BMI 40+). Adjusting for age, race, family history of PCa, institution and year of RP, and PSA at diagnosis, BMI was identified as a weak ($R2<0.005$) but independent predictor for increased prostate weight ($p=0.009$), higher Gleason score ($p=0.020$), and worse pathological tumour stage ($p=0.004$), but not for PSM ($p=0.206$). RP failure was not increased in univariate (HR 1.01; 95% CI 0.98–1.03) or multivariate (HR 0.99; 95% CI 0.95–1.02) analyses.

Conclusions: In our cohort, patients with localized PCa and higher BMI harbour higher grade and stage PCa, suggestive of more aggressive PCa; however, BMI was not an independent predictor for PSM or RP failure.

References:

1. Allott EH, Masko EM, Freedland SJ. Obesity and prostate cancer: Eeighing the evidence. *Eur Urol* 2013;63:800-9. https://doi.org/10.1016/j.eururo.2012.11.013
2. Goris Gbenou MC, Peltier A, Schulman CC, et al. Increased body mass index as a risk factor in localized prostate cancer treated by radical prostatectomy. *Urol Oncol* 2016;34:254.e1-6. https://doi.org/10.1016/j.urolonc.2015.12.009
3. Kok DE, van Roermund JG, Aben KK, et al. Body mass index is not a predictor of biochemical recurrence after radical prostatectomy in Dutch men diagnosed with prostate cancer. *World J Urol* 2011;29:695-701. https://doi.org/10.1007/s00345-010-0629-0
4. Magheli A, Rais-Bahrami S, Trock BJ, et al. Impact of body mass index on biochemical recurrence rates after radical prostatectomy: An analysis utilizing propensity score matching. *Urology* 2008;72:1246-51. https://doi.org/10.1016/j.urology.2008.01.052
5. Mandel P, Kretschmer A, Chandrasekar T, et al. The effect of BMI on clinicopathologic and functional outcomes after open radical prostatectomy. *Urol Oncol* 2014;32:297-302. https://doi.org/10.1016/j.urolonc.2013.09.005
6. Narita S, Mitsuzuka K, Yoneyama T, et al. Impact of body mass index on clinicopathological outcome and biochemical recurrence after radical prostatectomy. *Prostate Cancer Prostatic Dis* 2013;16:271-6. https://doi.org/10.1038/pcan.2013.16
7. Zhong S, Yan X, Wu Y, et al. Body mass index and mortality in prostate cancer patients: A dose-response meta-analysis. *Prostate Cancer Prostatic Dis* 2016;19:122-31. https://doi.org/10.1038/pcan.2015.64

MP-08.19

Cardiovascular disease characteristics of newly diagnosed prostate cancer patients: Findings from the pilot phase of RADICAL PC

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Study Groups: Prostate Cancer Canada.

Introduction: Administrative registries suggest that cardiovascular disease (CVD) develops frequently in men with prostate cancer (PCa). The goals of RADICAL PC are to identify the incidence and major determinants of CVD and to evaluate whether systematic CVD risk factor modification reduces adverse CV events in men with PCa. We report the findings for the pilot phase of this study.

Methods: Radical PC recruits consecutive men with a new diagnosis of PCa or commencing androgen-deprivation therapy (ADT) for the first time. Those who do not see a cardiologist annually are randomized in an open manner to receive a CV risk factor intervention (acetylsalicylic acid [ASA], statin, blood pressure-lowering to a target systolic of 130 mmHg, and standardized exercise and dietary counselling). Those not eligible for randomization are followed to provide a representative sample. At least 6000 men will be recruited and followed for an average of three years. Renal function, lipids, and HbA1c will be measured serially. The primary endpoint is the composite of CV death, myocardial infarction, stroke, heart failure, or arterial revascularization. Fisher's exact test and ANOVA test were used for categorical and normally distributed continuous variables comparisons, respectively.

Results: The characteristics of the first 421 participants are presented. Of these, 334 were newly diagnosed and 87 were receiving ADT for the first time; 25 had metastatic disease and 62 were undergoing radiotherapy. Of all participants, 56% have been randomized, and the remainder are undergoing passive followup. Of the 246 participants with no known hypertension, 31% had blood pressure in the hypertensive range. 17% of the patients are diabetic, 55% are current or previous smokers, and 81% are overweight (45%) or obese (36%). A third of the patients are on statins and a third take ASA. Patients who are commencing on ADT are older (67 ± 8.4 vs. 71 ± 8.3 years; $p<0.0001$) and have higher prevalence of pre-existing coronary artery disease (11% vs. 20%; $p=0.003$) compared to those who have no indication for ADT.

Conclusions: Pre-established CVD and its risk factors are very common in newly diagnosed PCa patients. The baseline characteristics of patients who are planned to initiate ADT may place them in a higher CV risk compared to the general PCa patient population.

MP-08.20

Long-term incidence of venous thromboembolic events following cystectomy: A population-based analysis

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Study Groups: Canadian Institute of Health Research Banting and Best Doctoral Award, Ajmera Family Chair in Urologic Oncology, Institute for Clinical Evaluative Sciences.

Introduction: Cancer and immobility both contribute to the development of venous thromboembolic events (VTE), including pulmonary embolism and deep vein thrombosis. As such, patients undergoing radical cystectomy for bladder cancer are at elevated risk. We sought to assess the long-term incidence of VTE among all patients undergoing radical cystectomy in the province of Ontario.

Methods: We conducted a population-based cohort study to examine the incidence of VTE, a composite of pulmonary embolism and deep vein thrombosis, among all patients treated with radical cystectomy for bladder cancer between 2002 and 2014 in Ontario, Canada. We estimated the cumulative incidence of VTE and used Fine and Grey competing risk

MP-08.20. Table 1. Baseline demographic characteristics on patients undergoing radical cystectomy for bladder cancer

	No chemotherapy	Preoperative chemotherapy	Postoperative chemotherapy
Sample size (n)	2495	433	695
Age, categorical (n, %)			
Less than 50 years	74 (3.0)	36 (8.3)	61 (8.8)
50–64 years	615 (24.6)	161 (37.2)	271 (39.0)
65–69 years	388 (15.6)	83 (19.2)	138 (19.9)
70–74 years	487 (19.5)	76 (17.6)	115 (16.5)
75–79 years	511 (20.5)	54 (12.5)	83 (11.9)
80 years and older	420 (16.8)	23 (5.3)	27 (3.9)
Gender (n, %)			
Female	659 (26.4)	111 (25.6)	166 (23.9)
Male	1836 (73.6)	322 (74.4)	529 (76.1)
Comorbidity, ACG (n, %)			
0–5	193 (7.7)	33 (7.6)	52 (7.5)
6–8	719 (28.8)	120 (27.7)	230 (33.1)
9–10	860 (34.5)	150 (34.6)	244 (35.1)
12+	723 (29.0)	130 (30.0)	169 (24.3)
Previous VTE (n, %)	11 (0.4)	13 (3.0%)	6 (0.9)
Geographic location (n, %)			
Urban	2103 (84.3)	368 (85.0)	585 (84.2)
Rural	387-391*	60–64*	110 (15.8)
Missing	1–5*	1–5*	0
Diversion type (n,%)			
Continent diversion	518 (20.8)	105 (24.2)	172 (24.7)
Ileal conduit	1977 (79.2)	328 (75.8)	523 (75.3)
Laparoscopic technique (n)	<5	<5	<5
Extended lymphadenectomy (n, %)	652 (26.1)	214 (49.4)	154 (22.2)
Year of treatment (n, %)			
2002	128 (5.1)	0	27 (3.9)
2003	178 (7.1)	1–5*	42 (6.0)
2004	188 (7.5)	8–12*	63 (9.1)
2005	192 (7.7)	10 (2.3)	62 (8.9)
2006	233 (9.3)	27 (6.2)	67 (9.6)
2007	239 (9.6)	22 (5.1)	68 (9.8)
2008	237 (9.5)	22 (5.1)	67 (9.6)
2009	230 (9.2)	51 (11.8)	72 (10.4)
2010	244 (9.8)	48 (11.1)	63 (9.1)
2011	211 (8.5)	66 (15.2)	59 (8.5)
2012	209 (8.4)	78 (18.0)	57 (8.2)
2013	206 (8.3)	96 (22.2)	48 (6.9)

*Institute for Clinical Evaluative Sciences (ICES) privacy regulations prevent the reporting of cell with fewer than 5 patients; as a result, these and any other cells that would allow their derivation are suppressed. ACG: Johns Hopkins Adjusted Clinical Groups; VTE: venous thromboembolic events.

survival analysis to assess risk factors for VTE while accounting for the risk of any cause mortality.
Results: Among 3623 eligible patients, the 10-year cumulative incidence of VTE was 6.68% (Table 1). Among those who experienced VTE, the median time from surgery was 216 days (interquartile range 52–677; mean 527); however, VTE rates peaked much earlier, with a mode of 20 days. Neither preoperative (hazard ratio [HR] 0.68, 95% confidence interval [CI] 0.39–1.18), nor postoperative chemotherapy (HR 1.32, 95% CI 0.95–1.84) were significantly associated with VTE incidence. While patients with a prior history of VTE had increased risk of VTE after cystectomy (HR 5.1, 95% CI 2.2–12.0), age, gender, comorbidity score, rurality, diversion type (continent vs. ileal conduit), treatment at an academic institution, or year of treatment were not significantly associated with the risk of VTE.
Conclusions: Among patients undergoing cystectomy for bladder cancer, the cumulative incidence of VTE continues to rise long after the date of surgery.

MP-08.21
Creation of a prediction tool for renal function after partial and radical nephrectomy: Personalizing decision-making for renal cancer surgery
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Introduction: Our objective was to create a preoperative prediction tool for renal function outcomes at various time points following partial nephrectomy (PN) and radical nephrectomy (RN) to help guide the choice of surgical approach.
Methods: The Mayo Clinic Nephrectomy Registry was queried for patients who underwent PN or RN for a renal tumour between 1997 and 2013. Exclusions were nodal or distant metastases, venous tumour thrombus on imaging, and preoperative estimated glomerular filtration rate (eGFR) <15 mL/min. Parsimonious linear regression models predicting eGFR were created for PN and RN using backward selection of candidate preoperative predictors, and eGFR predictions at one year are presented. Adjusted R^2, a value ranging from 0–1 that represents the proportion of total variation in eGFR explained by the model, was used to quantify predictive ability.
Results: The analytic cohort included 1525 and 935 patients undergoing PN and RN, respectively. Mean (standard deviation [SD]) preoperative eGFR and tumour size were 72 (20) mL/min and 3.4 (1.9) cm, respectively, for patients undergoing PN, and 65 (18) mL/min and 7.1 (3.8) cm, respectively, for patients undergoing RN. The model for PN included age, presence of a solitary kidney, smoking status, performance status, body mass index (BMI), preoperative eGFR, tumour size, and open vs. lap surgical approach (R^2=0.78), while the model for RN included age, diabetes, BMI, preoperative eGFR, tumour size, and surgical approach (R^2=0.68). As an example using these models, a 68-year-old, non-smoking, non-diabetic, Eastern Cooperative Oncology Group (ECOG) 0, binephric patient with a BMI of 20kg/m^2, a preoperative eGFR of 100 mL/min, and a 6.5 cm renal mass will have a predicted eGFR of 85 mL/min following open PN and 63 following laparoscopic RN at one year.
Conclusions: We created a prediction tool for renal function following RN and PN. If validated, this tool may be useful during patient counselling by providing personalized predicted renal function outcomes.

MP-08.22
Percutaneous cryoablation for complex renal tumours
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Introduction: Nephron-sparing surgery for anatomically complex renal tumours, as measured by the RENAL Nephrometry Score (NS), is associated with technical difficulty and potential complications. Our objective was to characterize the outcomes of percutaneous cryoablation (PCA) for complex renal tumours and evaluate for potential associations between tumour complexity and outcomes.
Methods: Patients with renal tumours treated with PCA were identified using our prospectively maintained ablation registry (2003–2015). Salvage procedures and inherited tumour syndromes were excluded. The associations between NS and risk of complications, renal function impairment, local failure, and cancer-specific mortality (CSM) were evaluated using univariate and multivariable logistic, linear, and Cox regression models.
Results: The cohort included 618 tumours treated in 565 patients. Median followup was 34 months (interquartile range [IQR] 14, 66). Complications (any grade) during a procedure (n[total]=87, 15%) were more frequent with higher NS (score 4–6: 10%; 7–9: 14%; 10–12: 36%; p<0.001). Higher NS was independently associated with risk of complications (odds ratio [OR] [per one-point]=1.3; 95% confidence interval [CI] 1.2–1.5; p<0.001). Of all the NS components, tumour size was the most strongly associated with complication risk (OR 3.4; 95% CI 2.2–5.2; p<0.001). Median decline in GFR from baseline was 9% (IQR 0,22) at last followup. Each additional point in NS was associated with a 1.3% (95% CI 0.4–2.1; p=0.005) greater GFR decline from baseline. Nephrometry score was not significantly associated with local failure (n[total]=14, 2%; score 4–6: 2%; 7–9: 3%; 10–12: 5%; p=0.32) or CSM (n[total]=8, 2%; score 4–6: 2%; 7–9: 3%; 10–12: 2%; p=0.88).
Conclusions: PCA for high-complexity tumours is associated with a tumour size-driven increased risk of post-procedural complications. Higher NS is associated with a small additional decline in renal function. Risks for local failure and CSM are low, regardless of tumour complexity.

MP-08.23
Clinical outcomes for Canadian patients in the phase 3 METEOR study of cabozantinib vs. everolimus in advanced renal cell carcinoma
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Introduction: In the METEOR study (NCT01865747), patients with advanced renal cell carcinoma (RCC) and prior treatment with vascular endothelial growth factor receptor (VEGFR) tyrosine kinase inhibitor (TKI) therapy were randomized to receive cabozantinib (cabo) or everolimus (eve). Cabo demonstrated improved progression-free survival (PFS; median 7.4 vs. 3.8 months; hazard ratio [HR] 0.58; 95% confidence interval [CI] 0.45–0.74; p<0.0001), overall survival (OS; median 21.4 vs. 16.5 months; HR 0.66; 95% CI 0.53–0.83; p=0.0003), and objective response rate (ORR; 17% vs. 3%; p<0.0001) compared with eve.[1,2] Here we evaluate clinical outcomes for pts enrolled in Canada.
Methods: 658 patients were randomized 1:1 to receive cabo (60 mg once daily [qd]) or eve (10 mg qd) with stratification by Memorial Sloan Kettering Cancer Centre risk group and number of prior VEGFR TKI therapies.
Results: 40 patients were enrolled at 11 sites in Canada: 23 patients in the cabo arm and 17 in the eve arm. Median PFS was 7.4 months (95% CI 4.3–not estimable [NE]) with cabo and 3.7 months (95% CI 1.7–4.7) with eve (HR 0.40; 95% CI 0.17–0.89). Median OS was 20.8 months (95% CI 13.1–NE) with cabo and 12.8 months (95% CI 5.5–15.9) with eve (HR 0.33; 95% CI 0.14–0.75). ORR for the cabo arm was 17% (95% CI 0.14–0.75) vs. 0% for the eve arm. The median duration of exposure was 9.2 months with cabo and 3.7 months with eve. The proportion of patients who received subsequent systemic anticancer therapy was 39% in the cabo arm vs. 59% in the eve arm. The safety profiles of cabo and eve in the Canadian cohort were generally consistent with those in the overall study population.
Conclusions: These results from Canadian patients with advanced RCC enrolled in METEOR are consistent with those for the overall study population, with observed improvements for cabo compared with eve in the three key efficacy endpoints of PFS, OS, and ORR.

Poster Session 9: Technology Innovation and Stones
June 26, 2017; 0800–0930

IPD-09.01

Same-session bilateral ureteroscopy for multiple stones: Results from the Clinical Research Office of Endourological Society (CROES) Ureteroscopy (URS)

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Introduction: We present an international experience with ipsilateral ureteroscopy (I-URS) for multiple stones and bilateral URS (B-URS) for multiple stones, using data collected from the Clinical Research Office of the Endourological Society (CROES) Ureteroscopy (URS) Global Study. Our objective was to compare I-URS and B-URS treatment characteristics and outcomes, as well as the outcomes of multiple single-session stone treatments (I-URS and B-URS) with single-stone URS treatments.

Methods: The CROES URS Global Study includes 114 centres in 32 countries. Patients undergoing B-URS, I-URS, and URS for a single stone were identified. Intraoperative characteristics and postoperative outcomes were identified for each patient. Univariate regression analysis and inverse-probability-weighted regression adjustment (IPWRA) analyses were used to compare outcomes and adjust for difference between centres.

Results: The CROES URS Global Study consists of 11 885 patients. A total of 2153 (18.7%) patients were treated for multiple stones, with 1880 (87.3%) and 273 (12.7%) patients undergoing I-URS and B-URS, respectively. The univariate and IPWRA models for B-URS vs. I-URS and multiple- vs. single-stone treatments show that patients with B-URS and multiple-stone treatments have lower stone-free rates, higher re-treatment rates, and longer operating times compared to patients who underwent I-URS and single-stone treatment. There was no difference in complication rates between B-URS, I-URS, and single-stone URS.

Conclusions: This study represents the largest series of patients undergoing URS for bilateral and multiple ipsilateral stones. Our findings suggest a decrease in stone-free rates, increased re-treatment rates, increased operating time, and a longer hospital admission in patients treated for multiple stones. The treatment of multiple stones and B-URS is safe when compared to single stone and I-URS.

IPD-09.02

Prospective, randomized, controlled trial of novel lead-free drape (RADIONEX) for radiation protection in retrograde intrarenal surgery stone procedures

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Introduction: In the endourology field, retrograde intrarenal surgery (RIRS) procedure for urinary stone management is associated with significant radiation exposure.[1-4] We investigated whether a radiation-attenuating drape (RADIONEX) reduces surgeon radiation exposure during any procedure of RIRS.

Methods: We performed a prospective, randomized study in RIRS procedures at a high-volume centre. Procedures were randomly assigned to groups receiving (study group) lead-free radiation-attenuating drapes (n=54) or control group (n=48). The drapes were suspended between the leg of the patients (study group) during RIRS procedures (Fig. 1; available at https://cua.guide/). The primary endpoint was the effective dose of radiation measured at the endourologist's head (D1), chest behind the apron (D2), and right leg (D3). The cumulative radiation exposure was also estimated. Statistics analysis was performed through SPSS.

Results: Fluoroscopy time and absorbed radiation dose were similar in both groups. Mean radiation exposure for control group vs. study group was 48.8 ± 16.77 vs. 51.6 ± 17.08 mGy/cm^2. The relative risk reduction in radiation was 30%, 20%, and 21% at the three sites. At a high-volume centre in which an endourologist performs 100 therapeutic RIRS per year, the estimated cumulative effective dose at the endourologist's head, chest, and leg showed no difference using (RADIONEX); however, head (D1) showed more reduction.

Conclusions: The addition of a radiation-attenuating drape (RADIONEX) as radiation protection during RIRS insignificantly decreases radiation exposure to the endourologist by 20–30%. Nevertheless, >100 procedures should be performed to re-evaluate this drape.

References:

1. Seibert JA. One hundred years of medical diagnostic imaging technology. *Health Phys* 1995;69:695-720. https://doi.org/10.1097/00004032-199511000-00006
2. Christodoulou EG, Goodsitt MM, Larson SC, et al. Evaluation of the transmitted exposure through lead equivalent aprons used in a radiology department, including the contribution from backscatter. *Med Phys* 2003;30:1033-8. https://doi.org/10.1118/1.1573207
3. Heshmatollah Soufi Majidpour. Risk of radiation exposure during PCNL. *Urol J* 2010;7:87-9.
4. Hellawell GO, Mutch SJ, Thevendran G, et al. Radiation exposure and the urologist: What are the risks? *J Urol* 2005;174:948-52; discussion 52. https://doi.org/10.1097/01.ju.0000170232.58930.8f

IPD-09.03

The impact of one week of preoperative tamsulosin on deployment of 16 French ureteral access sheaths

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Introduction: Use of a ureteral access sheath (UAS) has been shown to decrease operative time, improve stone-free rates, and lower intrarenal pressures during ureteroscopy. With a bigger UAS, the larger dual lumen ureteroscopes can be passed and stone fragments up to 4 mm can be retrieved. We hypothesized that facilitating ureteral relaxation might aid placement of the 16 French (F) UAS. In late 2016, two surgeons (JL and RVC) began to routinely pretreat patients undergoing percutaneous nephrolithotomy (PCNL) or ureteroscopy (URS) for one week with tamsulosin.

Methods: A retrospective chart review was conducted on 84 patients who underwent PCNL or URS in non-stented ureters between January 2015 and September 2016. Demographic data, tamsulosin usage, UAS size (11 F, 14 F, and 16 F), deployment failure, and occurrence of ureteral injuries were reviewed. We performed a univariate and multivariate analysis to assess the impact of tamsulosin administration on the size of the UAS deployed.

IPD-09.03. Table 1. Demographic and ureteral access sheath deployment characteristics

Variable	No tamsulosin	Tamsulosin	p
Number of patients	38	46	
Age in years (average)	56	60	0.152
BMI (average)	30	30	0.364
ASA (average)	3	3	0.944
Male (percentage)	71%	52%	0.408
Side of deployment			
Left (percentage)	47%	54%	0.692
Bilateral (percentage)	8%	2%	
Procedure			
Percutaneous nephrolithotomy	16	38	
Ureteroscopy	22	8	
Ureteral access sheath size (percentage)			
16 French	15 (39%)	38 (83%)	<0.001
14 French	19 (50%)	3 (7%)	
11 French	4 (11%)	5 (11%)	
Failure to place original sheath size	3 (8%)	7 (15%)	
Ureteral injuries	3%	4%	

ASA: American Society of Anesthesiologists; BMI: body mass index.

Results: There was no difference between the tamsulosin group and non-tamsulosin group with regard to age, sex, body mass index, or side of ureter treated (Table 1). The tamsulosin group had a higher percentage of 16 F deployment 83% vs. 39% (p<.001), and no significant difference in ureteral injuries (4% vs. 3%). Univariate and multivariate analysis revealed that tamsulosin pretreatment statistically significantly increased the odds ratio (16.0 and 22.9, respectively) for successful passage of a 16 F UAS vs. 14 F UAS.
Conclusions: In this retrospective study, one week of preoperative tamsulosin was associated with an increase in the successful deployment of a 16 F UAS.

IPD-09.04

24-month outcomes of a prospective, phase 1 study of magnetic resonance imaging-guided transurethral ultrasound ablation in patients with localized prostate cancer

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Study Groups: Study sponsored by Profound Medical Inc.
Introduction: Magnetic resonance imaging (MRI)-guided transurethral ultrasound ablation (TULSA) is a novel, minimally invasive technology for ablation of prostate tissue. The ultrasound ablation volume is shaped to patient-specific anatomy and pathology, using active MRI thermometry feedback control. Herein, we report 24-month results of the prospective, phase 1 study on safety and feasibility of TULSA for localized prostate cancer (PCa), conducted in Canada, Germany, and the U.S.
Methods: 30 patients with biopsy (bx)-proven PCa were treated (T1c-T2a, prostate-specific antigen [PSA] ≤10ng/ml, Gleason ≤3 + 4). TULSA was delivered with 3 mm margins at gland periphery, and expected 10% residual pericapsular viable prostate tissue. Primary endpoints were safety and feasibility (spatial ablative precision). Exploratory outcomes included PSA, quality of life, MRI, and 12-core TRUS bx.
Results: Median age was 69 (interquartile range [IQR]) 67–71) years, PSA 5.8 (3.8–8.0 ng/ml). Treatment time was 36 (26–44) minutes. Spatial control of ablation was ± 1.3 mm. Adverse events (CTCAE v4) included urinary tract infection (UTI) (10 patients, Grade 2), acute retention (three patients G1, five Grade 2), and epididymitis (one patient, Grade 3). International Prostate Symptom Score (IPSS) and International Index of Erectile Function (IIEF) returned to preoperative levels and stabilized at 24 months. To date, PSA nadir is 0.5 ng/ml (0.3–0.8). Median PSA decreased 87% at one month, stable to 0.8 ng/ml at 12 months (n=30), and to 0.6 ng/ml at 24 months (n=23). Positive bx at 12 months show 61% reduction in total cancer length, clinically significant disease in 9/29 patients (31%), and any disease in 16/29 pts (55%). MRI at 12 months show 88% prostate volume reduction. Following positive bx at 12 months, four patients underwent uncomplicated salvage radical prostatectomy, one patient salvage radiation therapy, and one patient focal laser ablation.
Conclusions: MRI-guided TULSA is well-tolerated in patients with localized PCa. TULSA can offer a low morbidity profile while keeping post-treatment salvage therapy options open if necessary. An international 12-centre trial in 110 patients with reduced gland periphery margins is now underway to further evaluate safety and efficacy of whole-gland TULSA.

MP-09.01

Current use of medical expulsive therapy among endourologists

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Introduction: We sought to characterize current practice patterns and perspectives among endourologists on medical expulsive therapy (MET) for the treatment of acute ureteral calculi.
Methods: An online survey was administered via REDCap to Endourological Society members in August 2016. MET usage and index case management were evaluated based on respondents' international status, practice setting, experience, and fellowship training. Statistical analysis was performed using SPSS via Pearson chi-square, Fisher's exact, and student's t-tests.
Results: A total of 238 completed responses were received; of these, 64.3% were international, 61% were academic urologists, 65% had >10 years in practice, and 71% were fellowship-trained in endourology (Table 1). 70% preferred MET as their initial approach, with increasing use for more distal stones and for stones <8 mm in size (Table 2). While 82% of respondents were aware of the SUSPEND trial, which discouraged MET, 70% of them reported that the results had not altered their use of MET. Mean MET prescription length was 19.9 ± 10.3 days for all respondents and 22.9 ± 10.7 days for U.S. respondents. Respondents who were U.S.-based, in an academic setting, and with <10 years' experience prescribed MET for significantly longer durations (Table 3). U.S.-based respondents were also more likely to use MET for proximal and midureteral stones, as well as for stones >10 mm (Table 4). Additionally, U.S.-based respondents with <10 years in practice were more likely to agree that additional education of emergency department physicians on MET is necessary (94% vs. 76%; p=0.033).
Conclusions: Despite some of the recent controversies surrounding MET, it appears that the majority of urologists within the Endourological Society use it as their initial approach, and more so in distal ureteral calculi. Our data suggests that current use of MET among endourologists is largely in line with the latest American Urological Association (AUA) practice guidelines.

MP-09.01. Table 1. Demographics

	US (n=84)	International (n=153)	Academic (n=144)	<10 years in practice (n=81)	Endo fellow (n=154)	Total (n=237)
Type of practice (n)	Ipsum					
Academic	61% (51)	61% (93)	-	64% (52)	69% (106)	61% (144)
Private – solo	7% (6)	11% (16)	-	7% (6)	6% (9)	9% (22)
Private – group	20% (17)	14% (22)	-	11% (9)	14% (21)	16% (39)
Multispecialty group	8% (7)	7% (11)	-	7% (6)	6% (9)	8% (18)
Federal	4% (3)	7% (11)	-	10% (8)	6% (9)	6% (14)
Years in practice (n)						
In training	0% (0)	1% (2)	1% (2)	-	1% (1)	1% (2)
<1 year	2% (2)	0% (0)	1% (1)	-	1% (1)	1% (2)
1–4 years	12% (10)	12% (18)	14% (20)	-	14% (21)	12% (28)
5–10 years	25% (21)	18% (28)	20% (29)	-	23% (35)	21% (49)
11–20 years	37% (31)	30% (46)	35% (51)	-	37% (57)	32% (77)
>20 years	24% (20)	39% (59)	29% (41)	-	25% (39)	33% (79)
Fellowship trained (n)						
Yes	79% (66)	67% (102)	21% (30)	25% (20)	-	71% (168)
No	21% (18)	33% (51)	79% (114)	75% (61)	-	29% (69)
Fellowship type (n)						
Endourology/stone disease	21% (14)	52% (52)	40% (45)	25% (15)	-	39% (66)
Minimally invasive surgery (MIS)	12% (8)	8% (8)	7% (8)	13% (8)	-	10% (16)
Combined endourology and MIS	59% (39)	33% (33)	47% (53)	58% (35)	-	43% (72)
Other	8% (5)	7% (7)	6% (7)	3% (2)	-	8% (14)

MP-09.01.Table 2. MET usage (size/location)

Variable	Percentage of respondents (n)
Location	
Proximal	44% (91)
Mid	59% (121)
Distal	98% (200)
Size	
<5 mm	74% (152)
5–8 mm	76% (156)
8–10 mm	33% (67)
>10 mm	8% (17)

MP-09.02

Single-session, primary, high-intensity, focused ultrasonography (HIFU) as treatment for localized prostate cancer: Predicting disease-free survival by risk stratification

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Introduction: High-intensity, focused ultrasonography (HIFU) is used with the goal of decreasing toxicity while maintaining efficacy for treatment of organ-confined prostate cancer. We assessed predictors of treatment success in a large cohort of patients for whom HIFU was the primary treatment.

Methods: We retrospectively analyzed data from 741 patients who underwent a single-session HIFU treatment by a single surgeon using a standardized treatment protocol. Treatment failure was defined as receipt of any salvage therapy or initiation of androgen deprivation. Descriptive statistics and Kaplan-Meier survival analyses were used to assess predictors of treatment failure. Patients with <6 months followup and/or any prior treatment were excluded.

Results: A total of 521 patients met inclusion criteria. Prior to treatment, mean age was 63.3 years, 91.5% had a Gleason grade between 5 and 7, and the majority (59%) had an intermediate D'Amico risk score. The mean prostate-specific antigen (PSA) was 7.7 ± 5.6 and mean PSA density was 0.33 ± 0.28. The majority (70.2%) had T1c staging. A total of 52 patients (10%) met the definition of treatment failure. Of the potential predictors for disease-free survival over time, statistical significance was found for PSA density (<0.2 vs. >0.2; $p<0.05$) and D'Amico risk stratification (low vs. intermediate vs. high; $p<0.05$), while baseline PSA (<10 vs. >10) approached significance ($p=0.05$). Prior transurethral resection of the prostate (TURP) was significantly associated with HIFU failure ($p<0.05$), as well as higher PSA values at six-month, one-year, and two-year followups ($p<0.005$, $p<0.001$, and $p<0.05$, respectively).

Conclusions: In this patient sample, lower PSA density and D'Amico risk categorization were significant predictors for disease-free survival post-HIFU. Prior TURP and higher followup PSA levels were each associated with treatment failure. The high treatment success rate (90%) in this sample suggests that whole-gland HIFU as an alternate treatment method for clinically localized prostate cancer appears promising.

MP-09.01.Table 3. Characteristics of MET usage

	U.S.	International	p	Academic	Non-academic	p-value	<10 years	>10 years	p	Fellow	Non-fellow	p
Currently prescribes MET to patients with ureteral calculi	94% (76)	87% (129)	0.115	90% (125)	89% (80)	0.802	91% (72)	89% (133)	0.561	88% (130)	91% (75)	0.473
Preferred initial approach – all options			0.507*			0.077*			0.031*			0.680*
Observation	12% (10)	14% (22)		15% (21)	12% (11)		10% (8)	15% (24)		15% (23)	11% (9)	
MET	76% (64)	67% (102)		74% (107)	63% (59)		82% (66)	64% (100)		71% (109)	69% (57)	
URS	8% (7)	10% (15)		6% (8)	15% (14)		4% (3)	12% (19)		8% (13)	11% (9)	
SWL	2% (2)	7% (11)		4% (6)	8% (7)		3% (2)	7% (11)		5% (7)	7% (6)	
Stenting	1% (1)	2% (3)		1% (2)	2% (2)		3% (2)	1% (2)		1% (2)	2% (2)	
NT placement (excluded)	0% (0)	0% (0)		0% (0)	0% (0)		0% (0)	0% (0)		0% (0)	0% (0)	
Preferred initial approach – MET only	67% (102)	76% (64)	0.126	74% (107)	63% (59)	0.075	82% (66)	64% (100)	0.006	71% (109)	69% (57)	0.736
Reported being aware of controversy	89% (73)	78% (116)	0.043	89% (125)	72% (64)	0.001	84% (67)	81% (122)	0.648	86% (129)	75% (60)	0.038
Mean length of MET prescription in days (SD)	22.9 (10.7)	18.1 (9.7)	0.001	22.3 (10.5)	16.1 (8.7)	<0.001	23.9 (10.7)	17.7 (9.4)	<0.001	20.7 (10.9)	18.4 (9.1)	

*Fisher's exact test instead of chi-square due to small sample sizes. MET: medical expulsive therapy; NT: nephrostomy tube; SD: standard deviation; SWL: shockwave lithotripsy; URS: ureteroscopy.

MP-09.01. Table 4. MET usage for stone location and size (international respondents)

	U.S.	International	p
Use MET for proximal or mid stones	68% (57)	43% (65)	<0.001
Use MET for distal stones	89% (75)	82% (125)	0.124
Use MET for stones <10mm	88% (74)	84% (128)	0.357
Use MET for stones >10mm	13% (11)	4% (6)	0.009

MET: medical expulsive therapy.

MP-09.03

Renal function recovery following minimally invasive partial nephrectomy: Comparing short-term and long-term followup to establish recovery timing

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Introduction: Renal function post-partial nephrectomy (PN) has received significant attention; however, the timing of post-PN renal function recovery is not clearly established. We assessed renal function in the 6–12-week postoperative window compared with long-term recovery.

Methods: All minimally invasive (laparoscopic and robotic) PNs performed between 2002 and 2015 by a single surgeon at our centre (n=169) were reviewed retrospectively. Renal function was assessed at three days, 6–12 weeks, and one year post-PN, using a combination of estimated glomerular filtration rate (eGFR) from serum creatinine and relative renal uptake (RRU) from Tc99m-MAG3 renal scintigraphy. Both tests had been performed as part of routine followup. Together, eGFR and RRU provide the ipsilateral renal function (IRF) of the operated organ.

Results: Of 169 patients, 37 met all inclusion criteria. At 6–12 weeks postoperative, mean eGFR, RRU, and IRF recovery (relative to preoperative values) were 92.7%, 82.5%, and 77.1%, respectively. Both RRU and IRF recovery at 6–12 weeks differed significantly from three days postoperative ($p<0.05$), but not from one year postoperative, while eGFR was stable throughout followup. Findings were similar when the inclusion criteria were expanded to include a total of 89 patients.

Conclusions: Post-PN renal function recovery at 6–12 weeks is equivalent to long-term recovery at one year. This has important implications for post-PN followup, particularly in 1) planning staged procedures for bilateral synchronous renal masses; and 2) assessing the effects of novel PN techniques.

MP-09.04

Review of robot-assisted laparoscopic partial nephrectomy at the University of Alberta

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Introduction: The purpose of this study is to review the 90-day perioperative outcomes of patients undergoing robot-assisted laparoscopic partial nephrectomy (RAPN) between 2011 and 2016 at the University of Alberta.

Methods: Patients who had undergone RAPN for a renal mass in Edmonton between January 2011 and June 2016 were identified using billing codes. The primary outcome was 90-day complication rate. Secondary outcomes included intraoperative blood loss, 90-day transfusion rate, postoperative hemoglobin change, T stage, margin status, artery clamp type, length of stay, and demographics. Anonymized data were collected from office and hospital charts. Analysis was completed with descriptive statistics.

Results: 232 patients were included in this study. The mean age at time of operation was 57 years with a 2:1 male to female ratio (67% vs. 33%). 56 patients (24%) had a body mass index >35. Average intraoperative blood loss was 302 cc (range 50–5000 cc) and 7.8% of patients required a blood transfusion within 90 days of surgery. 198 masses (85%) were

renal cell carcinoma (pT1-3a) and 34 (15%) were benign. The positive/indeterminate margin rate was 6.5%. 114 patients (49%) had a full clamp of the main renal artery, whereas 117 (50%) had a zero ischemia/minimal ischemia approach with either a segmental branch clamped (44%) or no clamp (6%). 25 patients (11%) experienced a complication within the 90-day postoperative period, with 14 (6%) being high-grade (Clavien III or greater) complications. The most common complication was delayed renal bleed from arteriovenous fistula or pseduoaneurysm formation, with eight patients requiring angioembolization (segmental artery or main renal artery). The median length of stay was two days (mean: 2.4 days, range: 1–14 days).

Conclusions: RAPN outcomes at the University of Alberta are acceptable when compared with large published series with respect to 90-day perioperative outcomes. The positive/indeterminate surgical margin rate appears higher than published rates.

MP-09.05

Does method of sterlization affect the durability of digital flexible ureteroscope? A prospective comparative study between CIDEX and STERRAD

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Study Groups: Petra Uro-Group members have assisted in design.

Introduction: Flexible ureterorenoscope durability was and is still controversial, with variable number of uses. Our aim is to compare two different methods of sterilization for two new digital flexible ureteroscopes (DFU) (Flex-Xc) with chemical sterilization (CIDEX®) and low-temperature hydrogen peroxide gas plasma (STERRAD®).

Methods: ALL DFU procedures were performed in two centres between January 2015 and June 2016. We conducted prospective study between two new endoscope: Flex-Xc STORZ CIDEX endoscope (SN# 27403) and STERRAD endoscope (SN # 33027), using two different methods of sterilization for each. The methods of sterilization were either complete immersion with CIDEX or STERRAD. The endpoint was the first damage to either endoscopes. One single endourologist perform the procedures in both group. Patients characteristics and stone data, as well as intraoperative variables were recorded. We analyzed all obtained data using SPSS.

Results: DFUs were damaged after 59 and 29 procedures for CIDEX and STERRAD, respectively. The CIDEX endoscope was used for a total operative time of 49.3 hours, while the STERRAD one was used for 27.13 hours. Mean operative time was 51.9 minutes for CIDEX, while it was 57.3 minutes for STERRAD. Neither stone burden, nor laser duration had a significant impact over the results. Indications for flexible ureterorenoscopy were for stone treatment in 100%of the cases. The cause of damage of STERRAD endoscope was a leak at 29 procedures.

Conclusions: Method of sterilization plays an essential impact over DFU durability. Our study showed that CIDEX prolongs the life of the DFU longer than STERRAD.

References:

1. Knudsen B, Miyaoka R, Shah K, et al. Durability of the next-generation flexible fiberoptic ureteroscopes: A randomized, prospective, multi-institutional clinical trial. *Urology* 2010;75:534-8. https://doi.org/10.1016/j.urology.2009.06.093
2. Shah K, Monga M, Knudsen B. Prospective, randomized trial comparing two flexible digital ureteroscopes: ACMI/Olympus Invisio DUR-D and Olympus URF-V. *Urology* 2015;85:1267-71. https://doi.org/10.1016/j.urology.2014.12.012
3. Abraham JB, Abdelshehid CS, Lee HJ, et al. Effects of Steris 1 sterilization and Cidex ortho-phthalaldehyde high-level disinfection on durability of new-generation flexible ureteroscopes. *J Endourol* 2007;21:985-92. https://doi.org/10.1089/end.2007.0181
4. Multescu R, Geavlete B, Geavlete P. A new era: Performance and limitations of the latest models of flexible ureteroscopes. *Urology* 2013;82:1236-9. https://doi.org/10.1016/j.urology.2013.07.022

MP-09.06

Dual usage of a stone basket: Stone capture and retropulsion prevention

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Introduction: Stone migration during ureteroscopy (URS) for proximal ureteric calculi is a constant challenge. Several retropulsion prevention devices have been developed to optimize URS outcomes. Our technique involves capturing the stone within a four-wire Nitinol stone basket and then preforming laser lithotripsy to dust the stone while it is engaged in the basket. The dusted fragments wash out with the irrigation fluid and once small enough, the remaining stone is removed intact.

Methods: A retrospective chart review was preformed of all proximal URS procedures preformed for a solitary calculus (2000–2016). Patient characteristics, procedure time, stone size and composition, retropulsion rate, use of flexible URS, stone-free rate, and complications were collected. We compared our new technique introduced in 2010 to URS control procedures that did not use retropulsion prevention techniques or devices. Chi-squared analysis and ANOVA were used for statistical analysis.

Results: 152 patients (97 males and 55 females) underwent URS for proximal ureteric calculi. Mean stone diameter was 9.3 mm ± 3.4, with similar impaction rate between both groups (44.3% vs. 42.5% control; p=0.587). The mean surgical procedure time was 53.3 minutes ± 17.9 for the new technique and 65.2 minutes ± 29.2 for the control group (p=0.005). Compared to the new technique, the control group had a higher rate of retropulsion (16.5% vs. 34.3%, respectively; p=0.011) and required flexible URS more often to exclude or remove residual fragments (24.1% vs. 59.1%, respectively; p=0.001). Using the new technique, stone-free rates were higher (78.2% vs. 68.5%; p=0.177) and there was a lower likelihood of leaving residual fragments both <3 mm and ≥3 mm (p=0.002). Rate of ureteric injury and secondary procedures were similar between both techniques.

Conclusions: Our novel technique results in shorter operative times, lower retropulsion rates, and decreased postoperative residual stone fragments.

MP-09.07

How does a computed tomography-based software tool compare to the ellipsoid formula in estimating stone volume?

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Introduction: Renal/ureteral calculus size is typically reported as longest axial diameter (LD), which can be misleading when assessing stone burden. Stone volume is typically measured using ellipsoid formula, which is suboptimal in estimating volume of irregular or larger stones. Computed tomography (CT) software algorithms may be more accurate in assessing stone volume. Our study sought to compare stone volume estimated by ellipsoid formula (EF) and CT software against the true volume (TV) in an ex-vivo model.

Methods: 90 radio-opaque phantom stones were created using a clay/contrast mixture (range 0.5–40 cm^3, 814 HU ± 91) and scanned with CT. LD was measured using AGFA IMPAX software and volume was estimated by EF (ϖ*l*w*d*0.167) and the region-growing algorithm in the 3D software module (CT). TV was calculated by water displacement. Matched-pair analysis was performed to compare each estimate to TV.

Results: The mean stone volume was 4.7 (0.47–36.1), 4.75 (0.5–39.3), and 5.9 cm^3 (0.49–47), for TV, CT, and EF, respectively. Overall, there was a significant difference between EF and TV (p<0.0001), but not between CT and TV (p=0.5). The stones were then stratified into three groups based on volume. For small stones (<2 cm^3), EF volume was not (p=0.15) significantly different to TV, but CT volume was significantly different (p=0.003). For intermediate-sized stones (2–6), CT was not significantly different from TV (p=0.44), but EF was significantly different (p<0.001). For larger stones (>6), both CT (p=0.01) and EF (p<0.0001) differed significantly from TV; however, the mean difference in estimated volume for CT vs. TV was marginal at 0.88 cm^3 ± 0.70 compared to 5.65 cm^3 ± 5.55 for EF vs. TV (Table 1).

MP-09.07. Table 1. Results of a study comparing CT-based software tool to ellipsoid formula in estimating stone volume

n	Stone volume (cm^3)	Mean axial LD (mm)	TV (cm^3)	Mean diff TV vs. CT	p	Mean diff TV vs. EF	p
90		29.2	6.42 ± 6.57	0.59 ± 1.00	0.51 (-0.33, 0.16)	2.68 ± 4.43	<0.0001 (1.61, 3.50)
30	≤2	15.9	1.19 ± 0.42	0.15 ± 0.10	0.003 (0.036, 0.15)	0.13 ± 0.10	0.15 (-0.02, 0.01)
22	2–6	25.9	4.12 ± 1.18	0.67 ± 1.72	0.44 (-0.51, 1.11)	1.04 ± 0.90	<0.001 (0.49, 1.38)
38	>6	41.5	11.9 ± 6.85	0.88 ± 0.70	0.01 (-.079, -0.10)	5.65 ± 5.55	<0.0001 (3.59, 7.35)

CT: computed tomography; EF: ellipsoid formula; LD: longest axial diameter; TV: true volume.

Conclusions: CT-based volume estimate corresponds well to true stone volume and can be useful in pre- and postoperative assessment of stone burden. CT volume estimate was more accurate than EF for intermediate and large stones, which are the greatest clinical dilemma in obstructing urolithiasis.

MP-09.08

Incidence of kidney stones in Alberta, Canada

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Study Groups: Alberta Kidney Stone Working Group.

Introduction: The epidemiology of kidney stones is limited in Alberta and more broadly within Canada. We used population-based data to determine the incidence and recurrence of kidney stones in Alberta and how these estimates varied by patient demographics.

Methods: We used provincial administrative data (outpatient GP, inpatient, and ambulatory care claims) to identify all incident cases of kidney stones between April 2007 and March 2014. Incident cases were identified using prespecified diagnosis codes and defined as the first kidney stone encounter on or after April 1, 2007 with no prior diagnosis in the five years prior. Recurrence was defined as a diagnosis of kidney stones at least six months following the last visit within the index episode of care. Overall age and sex standardized rates per 100 000 patients were calculated. Estimates were also stratified by age category and across five geographic zones within the province (i.e., Calgary, Edmonton, North, Central, and South).

Results: The age, sex, standardized rate increased from 157 to 190 per 100 000 from 2007–2008 to 2013–2014 fiscal years; this was a 21% change over six years, leaving Albertans with a 14% lifetime risk of developing at least one kidney stone. The incidence increased with age and was greatest in adults aged ≥65 years (367/100 000). Rates were higher for men than women (212 vs. 171/100 000, respectively). For patients <40 years old, the incidence was greater in females than males, but for adults ≥40 years, the incidence was greater in males. Rates were lower in urban zones compared to rural zones, being highest in the North zone and lowest in the Edmonton zone (270 vs. 147/100 000, respectively). Recurrence rate among the incident cohort was approximately 10% at one year, 20% at three years, and 24% at five years.

Conclusions: The incidence of kidney stones in Alberta is increasing at a significant rate. These results highlight the need for greater awareness and care strategies for the growing number of patients with kidney stones.

MP-09.09

Markers of renal injury during shock wave lithotripsy with narrow vs. wide focal zones

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Introduction: Ex-vivo data on the SLK-F2 lithotripter that allows for a dual-focus system shows that the disintegration capacity and the renal vascular injury are independent of the focal diameter of the shock wave generator at the same peak positive pressure and disintegration power. We report on a subset of patients from our larger randomized trial for whom data on markers of renal injury were available.

Methods: A subset of 134 patients (out of 263 total patients randomized in the trial) with previously untreated radio-opaque solitary kidney stone were randomized to receive narrow- or wide-focus lithotripsy and also collected urinary markers of renal cellular damage. Microalbulin, creatinine, beta 2-microglobulin, microalbumin/creatinine ratio, and beta 2-microglobulin/creatinine ratio were measured pre-shock wave lithotripsy, immediately post-SWL, 24 hours post-SWL, and seven days post-treatment. Patients were followed with renal ultrasound to assess for the development of perinephric hematoma. Data was analyzed, controlling for presence of diabetes as a confounder.

Results: 68 patients were randomized to narrow-focus lithotripsy vs. 66 patients to wide-focus. The groups were similar in baseline characteristics, including age, gender, body mass index, stone size and density, skin-to-stone distance, and diagnosis of diabetes. Overall complication rates were comparable between the two groups (narrow 23.5% vs. wide 12.1%; p=0.085), including similar rates of perinephric hematoma (narrow 2.9% vs. wide 4.5%; p=0.624) and Steinstrasse (narrow 7.4% vs. wide 4.5%; p=0.493). Urinary markers of renal injury did change after SWL, and then normalized within seven days; however, there were no differences in the magnitude, timing, or degree of change between the narrow and wide focal zone groups.

Conclusions: The degree of renal injury, as assessed by renal cellular markers and by ultrasound assessment of perinephric hematoma, are comparable when using the narrow or wide focal zone of the Modulith SLX-F2.

MP-09.10

Natural history, complications, and re-intervention rates of residual stone fragments following percutaneous nephrolithotomy

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Introduction: The management of residual fragments (RFs) that persist after percutaneous nephrolithotomy (PCNL) is under discussion. RFs have the potential to grow and/or cause recurrence of symptoms, urinary tract infection, and ureteral obstruction.[1,2] Few studies have looked at RFs following PCNL[3-5] and are limited by small cohorts. The aim of this study was to retrospectively follow all patients with RFs after PCNL to identify predictors of stone-related events and identify the stone-free rate after PCNL at our single institution.

Methods: Data was retrospectively collected from patients who underwent PCNL from 2008–2013 at Vancouver General Hospital. Patients with RFs of any size following PCNL on postoperative Day 1 computed tomography of the kidneys, ureters, and bladder (CT-KUB) were included. Subgroup analysis was performed on subjects with CT, KUB X-ray, or ultrasound (US) within two years after PCNL to determine RF growth or passage.

Results: There were 658 patients who received a postoperative CT-KUB on Day 1 following PCNL. Of these, 310 patients (47%) had RFs 1 mm or larger, with RFs 1–2mm in 31 patients (4.7%), 2–4 mm in 164 patients (24.9%),

MP-09.10. Table 1. Primary and secondary outcomes characterized by residual fragment size

	Fragment ≤4 mm	Fragment >4 mm	p
Passage of fragments	28.3% (17/60)	7.4% (2/27)	0.047*
Growth of fragments (>1 mm)	42.7% (38/89)	31.2% (24/77)	0.149
Occurrence of complication	12.3% (24/195)	7.8% (9/115)	0.256
Re-intervention required	13.3% (26/195)	41.7% (48/115)	<0.001*

*Significant p<0.05.

and >4 mm in 115 patients (17.5%). RFs >4 mm were more likely to require reintervention (p<0.001) and less likely to pass spontaneously (p=0.047) (Table 1). There were no significant differences with respect to growth of RFs (p=0.149) or stone-related complications (p=0.26) based on RF size. On multivariable logistic regression, body mass index (BMI) (p=0.002) and size of largest RF (p<0.001) were the only significant predictors of reintervention. Kaplan-Meier analysis identified RFs >4 mm having a shorter survival time before requiring reintervention (Fig. 1; p<0.001).

Conclusions: The stone-free rate (0 RFs) was 53% following PCNL. 76.7% were stone-free or had RFs 4 mm or less, which correlates with previous studies. Larger RFs had higher rates of reintervention. The growth of RFs was independent of RF size, emphasizing the importance of obtaining a stone-free status following PCNL.

References:

1. Osman MM, Alfano Y, Kamp S, et al. Five-year followup of patients with clinically insignificant residual fragments after extracorporeal shock wave lithotripsy. *Eur Urol* 2005;47:860-4. https://doi.org/10.1016/j.eururo.2005.01.005
2. Khaitan A, Gupta NP, Hemal AK, et al. Post-ESWL, clinically insignificant residual stones: Reality or myth? *Urology* 2002;59:20-4. https://doi.org/10.1016/S0090-4295(01)01494-7
3. Altunrende F, Tefekli A, Stein RJ, et al. Clinically insignificant residual fragments after percutaneous nephrolithotomy: Medium-term followup. *J Endourol* 2011;25:941-5. https://doi.org/10.1089/end.2010.0491
4. Olvera-Posada D, Ali SN, Dion M, et al. Natural history of residual fragments after percutaneous nephrolithotomy: Evaluation of factors related to clinical events and intervention. *J Urol* 2016;97:46-50. https://doi.org/10.1016/j.urology.2016.06.049
5. Raman JD, Bagrodia A, Gupta A, et al. Natural history of residual fragments following percutaneous nephrostolithotomy. *J Urol* 2009;181:1163-8. https://doi.org/10.1016/j.juro.2008.10.162

MP-09.11

Percutaneous irreversible electroporation for the treatment of small renal masses: The first Canadian case series

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Introduction: Irreversible electroporation (IRE) is a minimally invasive ablative technique used to treat solid tumours, including renal masses. It involves placement of percutaneous probes around the tumour, delivery of high-voltage electrical current causing destabilization of tumour cell membranes, and cellular death without local thermal injury. IRE is beneficial because it offers potentially curative treatment and renal preservation in circumstances where conventional treatments are deemed risky. We report the first Canadian case series of patients with small renal masses treated with this modality.

Methods: We performed a retrospective chart review of patients receiving percutaneous IRE using the Nanoknife probe by Angiodynamics to treat a solid enhancing renal mass at a single Canadian centre between July 2015 and July 2016. Adverse events, radiological and renal function outcomes were reviewed.

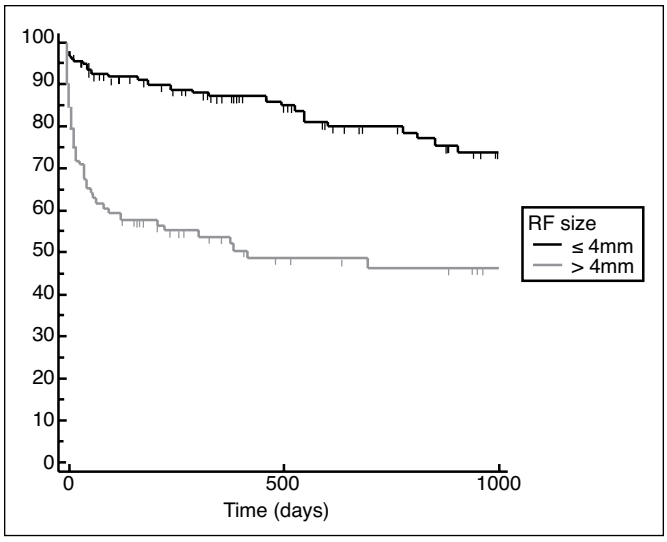

Fig. 1. MP-09.10. Kaplan-Meier survival curve of re-intervention survival time by size of residual fragment (RF) after percutaneous nephrolithotomy.

Results: Five patients (three females and two males, mean age 48 years [range 33–72 years]) were reviewed. Two patients had a solitary kidney and two others had Von-Hippel Lindau syndrome. Preprocedural estimated glomerular filtration rate (eGFR) ranged from 52–139 mL/min (Chronic Kidney Disease Epidemiology Collaboration [CKD EPI] formula). Mean tumour size was 2.8 cm (range 1.8–3 cm), with RENAL nephrometry scores of 8, 8, 8, 9, and 9. No adverse events were associated with IRE treatment. Followup magnetic resonace imaging (MRI) or comouted tomography (CT) at three months demonstrated no residual enhancement in all cases and eGFR decreased on average only 7 ml/min (range 0–20 ml/min). Three patients had longer followup, with no residual enhancement, complications, or clinically significant decrease in eGFR at nine, nine, and 11 months, respectively.

Conclusions: IRE is a safe treatment option for patients with difficult-to-treat small renal masses. Early radiological and renal function outcomes are encouraging; however, further study is required. Our centre is currently conducting a prospective trial to study the safety and efficacy of this procedure for patients with challenging-to-treat renal masses that require renal preservation.

MP-09.12

The impact of lower urinary tract symptomatology on fluid intake in stone-formers

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Introduction: Many patients experience lower urinary tract symptoms (LUTS) that may impair their ability to increase fluid intake for stone prevention. The objective of this study is to determine if there is a correlation between International Prostate Symptom Scores (IPSS) and 24-hour urine collection volumes.

Methods: We performed a retrospective chart review of stone-forming patients at a single centre over a two-year period, who had completed an IPSS questionnaire and a 24-hour urine collection. Exclusion criteria included symptomatic stone or urinary tract infection at time of IPSS completion, inadequate 24-hour collection, or incomplete questionnaire.

Results: Overall, 131 patients met inclusion criteria, with a mean age of 53 years. Stratification by IPSS into mild (0–7), moderate (8–19), and severe (20–35) yielded groups of n=96, 28, and 7, respectively. Linear

regression modeling did not reveal a correlation between IPSS and volume (p=0.1). There was no difference between urine volumes among the groups (p=0.07). Subgroup analysis of combined mild–moderate group compared to severe group mean urine volumes demonstrated a significant difference (2.0 L vs. 1.4 L; p=0.02). Patients with low urine output ≤1 L/day (n=10) had a significantly higher IPSS (11.7 vs. 6.1; p=0.036) than those with ≥2 L/day of urine (n=65). These groups showed significant differences in their responses to question 1 (incomplete emptying, 1.78 vs. 0.7; p=0.031), question 3 (intermittency, 1.7 vs. 0.6; p=0.011), and question 6 (stranguria, 1.8 vs. 0.35; p=0.002), with higher scores noted in the low output group.
Conclusions: This study is the first to examine the correlation between IPSS and 24-hour urine volume. Although our data does not show a linear relationship between urine output and IPSS, those with lower urine volumes (≤1 L/day) appear to have worse self-reported voiding symptoms when compared to those with adequate volumes (≥2 L/day) for stone prevention.

MP-09.13
Supracostal access tubeless percutaneous nephrolithotomy: Minimizing complications
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Introduction: Supracostal access in percutaneous nephrolithotomy (PCNL) may be avoided due to concern for thoracic complications. The objective of the study is to report the safety and efficacy of supracostal access using a tubeless (stent only) PCNL technique.
Methods: From July 2010 to October 2016, 70 patients (76 renal units) underwent a supracostal access tubeless PCNL. The study is a retrospective review of their perioperative and postoperative outcomes. All patients underwent a non-contrast computed tomography (CT) prior to the surgery. No nephrostomy tubes were left and all patients had a 7 F ureteral stent and Foley catheter placed. The nephrostomy sheath was removed with the patient held in expiration, similar to a chest tube, and the incision closed.
Results: Median patient age was 62 years. Median body mass index and American Society of Anesthesiologists (ASA) score was 32.9 kg/m^2 and 3, respectively. The median stone size was 20 x 21 mm, and 13 patients had complete staghorn stones. The upper calyx was the site of access in 50 cases. The access was above the 12th and 11th rib in 57 and 12 cases, respectively. The median length of hospital stay was 30 hours. Postoperatively, 48 (63%) patients had no residual fragments (<2 mm) on postoperative imaging. Eight patients underwent an ancillary procedure to clear residual stones (seven ureteroscopy [URS] and one extracorporeal shock wave lithotripsy [ESWL]), with an additional six patients becoming stone-free after this procedure. Thoracic complications occurred in two (2.6%) patients: one small pneumothorax that resolved with conservative management, and one symptomatic ipsilateral pleural effusion requiring thoracocentesis. Other complications occurred in nine patients (11.8%), which included bleeding requiring transfusion (one), fever (four), urinary retention (two), and syncope (two).
Conclusions: Compared to historical controls, our approach to upper tract PCNL using a nephrostomy tube-free approach resulted in an overall low thoracic complication rate and facilitated hospital discharge.

MP-09.14
Holmium-YAG laser: Impact of pulse energy and frequency on local fluid temperature
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Introduction: Protein denaturation depends on several factors, one of which is temperature. It has been previously shown that temperatures of as low as 60° C can cause denaturation. Laser fibers transmit energy to fragment stones; however, the temperature rise of its surrounding has never been studied. Understanding the heat impact, especially with the increased use of high-powered laser, is an important safety consideration. The objective of this preliminary study is to determine the time it takes from body temperature (37° C) to 60° C at various laser power settings.
Methods: 4 ml of normal saline were placed in a glass test tube, corresponding to the average volume of a dilated calyx. A Flexiva TracTip 200 optical fiber was submerged in the saline alongside a NTC-type thermistor to record temperature. A Lumenis VersaPulse Powersuite 100W laser was activated at the three commonly used lithotripsy settings: (1) 0.6 J/6 Hz; (2) 0.2 J/50 Hz; and (3) 1 J/10 Hz. Temperature readings were recorded once per second from 37 until 60° C, and the time was recorded. This procedure was repeated three times for each setting.
Results: The average time from 37 to 60° C for settings (1) 0.6 J/6 Hz, (2) 0.2 J/50 Hz, and (3) 1 J/10 Hz was 216.3 (204–233) seconds, 60.3 (59–62) seconds, and 82.1 (78–85) seconds, respectively. Continuing to apply energy resulted in temperatures reaching 100° C at all settings.
Conclusions: Use of laser fibers, and particularly at higher-power settings, can cause a rapid and substantial increase in the temperature of its surrounding fluid. This could have local tissue effects and some caution with higher-pulse energy and frequency should be employed. Further studies incorporating irrigation and live tissue models may aid to further define the risks.

MP-09.15
Evaluation of the use of a specialized computed tomography program to determine the association of visceral adipose tissue with nephrolithiasis
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Introduction: Obesity and metabolic syndrome are considered to be risk factors for nephrolithiasis, and their association with urinary biochemical abnormalities can increase the propensity for stone formation. Visceral adipose tissue (VAT, cm^2) is presumed to be a more accurate measure of obesity than body mass index (BMI, ≥30 kg/m^2=obese) and is strongly associated with insulin resistance, a prerequisite for stone formation. We evaluated the association between VAT and metabolic parameters in patients with a history of stones.
Methods: We reviewed records of 238 patients who had undergone percutaneous nephrolithotomy. VAT was measured using computed tomography (CT)-based fat delineation program AnalyzePro®, where axial slices were obtained at the level of the umbilicus (L4 and L5 [VAT1]) and at the L1-L2 level (VAT2). We analyzed the effect of VAT1 and VAT2 on comorbidities, urolithiasis risk factors, stone composition, urine metabolites, and metabolic syndrome.
Results: The mean age was 50.7 ± 12 years and 59.2% were female. Based on BMI, 77% of the sample was obese, while calculations with VAT1 and VAT2 resulted in higher obesity rates (89% and 88.6%, respectively). Stone composition was 79.6% mixed, 14% calcium oxalate, 4.3% uric acid, and <1% other. Both VAT1 and 2 were correlated with diabetes (p<0.005), hypertension (p<0.001), hyperlipidemia (p<0.05), and metabolic syndrome (p<0.005). At the VAT1 level, 24-hour urinalysis was significant for high levels of phosphate, citrate, and calcium (all p<0.05), but were non-significant at the VAT2 level.

Conclusions: Increased VAT, as an indicator of obesity, was significantly associated with metabolic syndrome, diabetes, hypertension, and hyperlipidemia. Our findings may support an easily reproducible marker of metabolic syndrome that can be used to stratify risk for development of nephrolithiasis and serve as a target for tailored patient treatment, management, and counselling.

MP-09.16
Evaluating the role for renal biopsy in the small renal mass: A single-centre study

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Introduction: The perceived limitations of high false-negative rates and potential needle-tract seeding has led to apprehension in attaining preoperative tissue diagnosis for renal tumours. With improved image-guided techniques, the urological community is beginning to recognize an expanded role for the renal biopsy.

Methods: This retrospective descriptive study evaluated patients undergoing image-guided renal biopsies for renal masses from January 2014 to June 2016. There were no limitations on age or the size of the renal mass. Sensitivity and positive-predictive values, with Clopper-Pearson confidence intervals, were calculated to determine if renal biopsy successfully identified malignant pathology before surgical resection.

Results: 93 patients were evaluated. Mean age at the time of detection was 59.5 years (± 13.0). Lesions had a mean size of 3.63 cm (± 1.94). Patients underwent their initial biopsy on average 11.4 months post-detection (± 19.3) with a median time of 3.84 months. 49 patients (52.7%) had a combination of radiographic and/or biopsy results concerning enough to warrant radical/partial nephrectomy. 37 patients (75.5%) had final surgical pathology correspond directly with initial biopsy report (malignant/benign and cell type). Four patients (8.16%) were correctly identified as having a malignant process, but their cell type was incongruent. Two patients had initial biopsy reports returned benign when surgical pathology confirmed malignant. Both patients underwent a repeat biopsy confirming malignancy prior to surgical excision. These values culminated in an adjusted sensitivity of 95.4% (95% confidence interval [CI] 84.2–99.4) and positive-predictive value of 97.6% (95% CI 87.4–99.9).

Conclusions: Renal biopsies are sensitive means of identifying malignant renal pathology. The use of repeat biopsies in the face of diagnostic uncertainty may further improve this sensitivity.

MP-09.17
Improving access to surgical innovation in Canada: A community hospital's experience with robotic surgery

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Introduction: Despite robot-assisted radical prostatectomy (RARP) becoming the standard of care for the treatment of localized prostate cancer around the globe,[1] wider access to innovative surgical techniques in Canada is limited by increased cost. To overcome this, our community healthcare institution implemented a "hub-and-spoke" model of shared access between two hospitals. This article reports our outcomes and financial experience over four years, benchmarked against provincial data in order to provide evidence for the feasibility of this approach.

Methods: We provide aggregate annual outcomes and financial data from our four-year experience with RARP. Oncological and perioperative outcomes were retrieved from institutional databases. Aggregate financial data was calculated for 2015/16. Provincial data was derived from two sources, the Prostate Cancer Surgery Quality Based Payment (QBP) Working Group,[2] and the Health Quality Ontario Health Technology Assessment on RARP.[3]

Results: 342 RARP procedures were performed from 2012–2016 inclusive (Fig. 1). The institutional length of stay (LOS) for RARP was 1.4 days, compared with one day across the province. Blood transfusion (BT) rates for RARP remained stable at 2.4% over the study period. The mean pT2

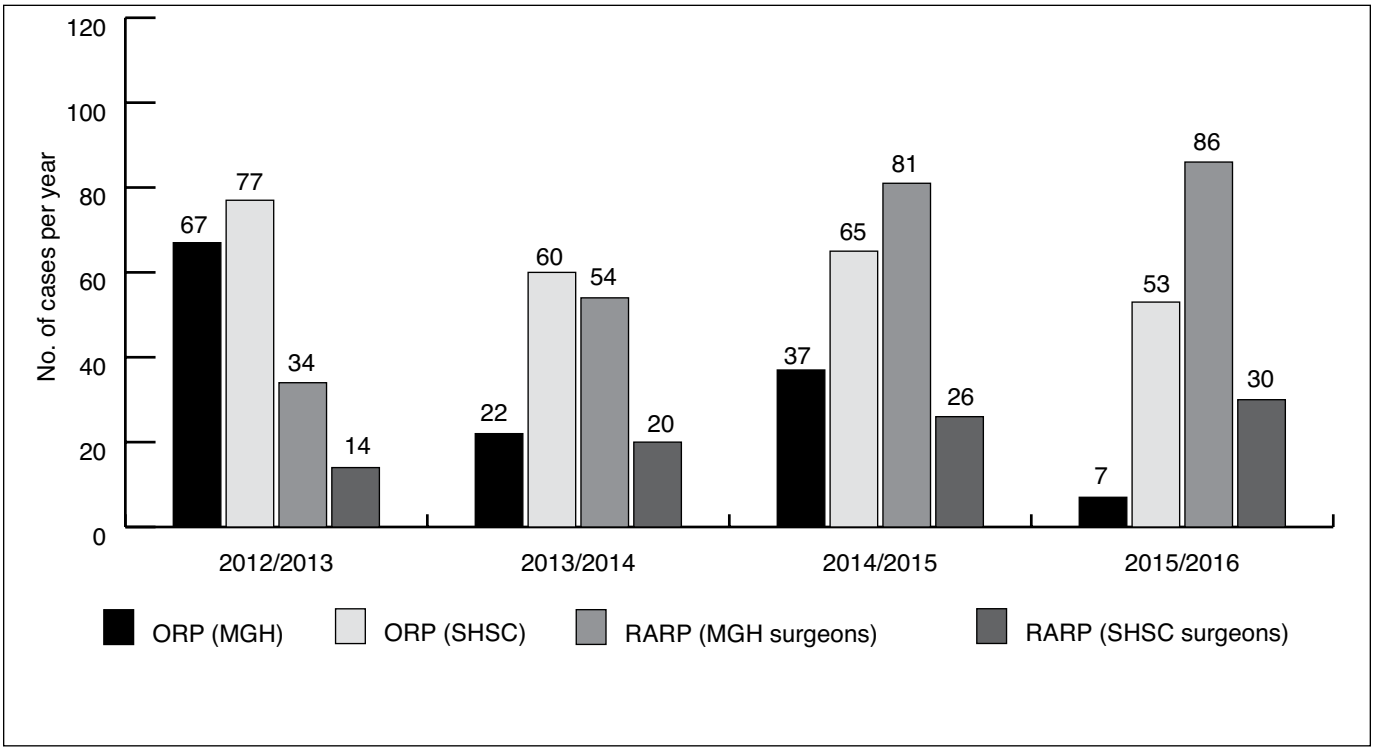

Fig. 1. MP-09.17. Surgical volumes, ORP and RARP 2012–2013 to 2015–2016. MGH: Michael Garron Hospital; ORP: open radical prostatectomy; RARP: robotic-assisted radical prostatectomy; SHSC: Sunnybrook Health Sciences Centre.

positive surgical margin rate was 13% at our centre, while provincial rates ranged from 9–25%, dependent on geographic location. Institutional operative times have trended down over the four years. In 2015/16, institutional RARP cases cost $9237, compared to $13 851 provincially. RARP BT rates and LOS compared favourably to open prostatectomy at both our institution and provincially.

Conclusions: We have demonstrated satisfactory outcomes and shown that increased financial expenditure can be mitigated through strategic interhospital partnerships. We propose inviting additional hospitals to join this "hub-and-spoke" program, to grow volume and create further cost-efficiency in performing of RARP.

References:

1. Leow JJ, Chang SL, Meyer CP, et al. Robot-assisted vs. open radical prostatectomy: A contemporary analysis of an all-payer discharge database. *Eur Urol* 2016;70:837-45. https://doi.org/10.1016/j.eururo.2016.01.044
2. Cancer Care Ontario. Prostate Cancer Surgery QBP Working Group Webinar. 2016.
3. Ontario Health Technology Advisory Committee (OHTAC). Robotic-assisted minimally invasive prostatectomy: OHTAC recommendation [Internet]. Toronto: Queen's Printer for Ontario; 2014 January.

MP-09.18

Predictors of failure of spontaneous stone passage in patients with acute renal colic after emergency department discharge

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Study Groups: MSI Foundation - Edmonton, Alberta.

Introduction: Many patients with acute renal colic are discharged from the emergency department (ED) after initial diagnosis and appropriate symptom management. Unfortunately, 20–30% of these patients require repeat ED visit for ongoing symptom control and 15–25% require urgent urological intervention. If these patients destined for outpatient failure could be identified prior to discharge, they may benefit from early intervention to reduce morbidity, as well as reduce healthcare expenditure of a repeat ED visit. We aimed to identify predictors of outpatient treatment failure, defined as the need for hospitalization or urgent intervention within 60 days of ED discharge.

Methods: Prospectively gathered administrative data from four hospitals in Calgary, Canada of patients with an ED diagnosis of renal colic from January 1, 2014 to December 31, 2014 was collected. Imaging reports were reviewed for stone characteristics. Data was linked to regional hospital databases to identify ED revisits, hospital admissions, and surgical procedures. Patients were excluded if they were non-residents of Calgary or if they had a previous renal colic visit within 30 days.

Results: Of 3104 patients with first ED visit for acute renal colic, 1081 were discharged without intervention for a trial of spontaneous passage. Median patient age was 50 and 72% were males. As per Table 1, on multivariate analysis we demonstrate the only predictors for outpatient treatment failure was proximal and midureteric stone location. We found no association between gender, degree of hydronephrosis, or stone size in this analysis.

Conclusions: Using a prospectively gathered database, we demonstrate patients with stones in their proximal or midureter are almost three times as likely to require 60-day hospital readmission or urgent intervention. Our results demonstrate treatment options should be considered for these patients prior to discharge.

MP-09.18. Table 1. Multivariate analysis of predictors of 60-day hospital re-admission or urgent intervention

Variable	Odds ratio	95% confidence interval
Proximal ureteric stone	2.82	1.8–4.5
Midureteric stone	2.87	1.5–5.2
Stone width	1.02	0.95–1.1
Male	1.42	0.89–2.3
Mild hydronephrosis	1.27	0.75–2.2
Moderate hydronephrosis	0.71	0.37–1.4
Severe hydronephrosis	0.86	0.19–2.9

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June 26, 2017; 0800–0930

IPD-10.01

Stakeholder perspectives on surgical simulation and skills training in urology residency programs in Canada

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Study Groups: Special thanks to the Research Methods Unit at the Nova Scotia Health Authority.

Introduction: With the shift to competency-based training, skills lab training (SLT) may become a mandatory part of Canadian urology residency programs (CURP). This study aims to identify:

- The status of SLT in CURP
- Stakeholder perspectives on the utility of SLT
- Barriers to developing and implementing SLT
- How to address these barriers

Methods: Surveys were made and issued to three groups of stakeholders: 1) program directors (PDs) or SLT directors at all 12 CURP – response rate 100%; 2) teaching faculty – response rate 33%; and 3) urology residents – response rate 24%. Surveys 2 and 3 were sent to 10 English CURP. Results were collected through email (survey 1) and Survey Monkey (surveys 2 and 3). Data was analyzed by Survey Monkey and Research Methods Unit at Nova Scotia Health Authority.

Results: 10 of 12 CURP have a surgical skills "boot camp" for first-year residents (R1), which 90% of R1s found useful. Eight of 12 CURP have a dedicated SLT; 42% of CURP have 1–3 sessions per year, 8% 5–7 per year, 33% >7 per year. Most residents have independent lab access, but 80% do so less than once a month. Over 90% of stakeholders find SLT useful, of which high-fidelity models are most preferred (faculty rated 3.66/4, residents 3.94/4). PDs identified lack of protected faculty time, funding, and infrastructure as the top three barriers to SLT implementation. Residents found lack of faculty time, protected academic time, and infrastructure as barriers. To overcome these barriers, PDs viewed protecting faculty time and more funding as potential solutions, while residents suggested protecting faculty time, building time into schedules, and providing after-hours lab access.

Conclusions: SLT is viewed as useful in CURP by residents, faculty, and PDs. Most CURP have defined SLT; programs without defined SLT have labs for resident use, but are underused. To continue to develop and progress SLT, more time must be available for SLT design and participation, with corresponding funding.

IPD-10.02

Surgical technical performance impacts patient outcomes in robot-assisted radical prostatectomy

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Introduction: The few studies that question the role of surgeon technical skill in influencing patient outcomes and safety have produced compelling results.[1] To date, this link has not been published in urology. We designed a study to better understand the role surgeon skill and error rating play in determining functional outcomes in robot-assisted radical prostatectomy (RARP).

Methods: We conducted a case-matched analysis of prospectively collected RARP endoscopic videos performed by a single surgeon. The primary outcome parameter was continence status at three months postoperatively,

IPD-10.02. Table 1. Comparison of GEARS, GERT, and RACE scores between continent and incontinent cohorts

Assessment tool	Step	Continent (n=17) Median (IQR)	Incontinent (n=17) Median (IQR)	Mann-Whitney U (p)
GEARS (score /25)	Bladder drop	19.00 (18.75–21.00)	19.00 (18.50–20.00)	1.000
	Endopelvic dissection	20.00 (18.00–22.00)	20.00 (18.50–20.00)	0.254
	Bladder neck	**20.00 (19.00–21.50)**	**18.00 (17.00–21.00)**	0.042
	Seminal vesicles	20.00 (18.00–21.00)	19.00 (17.50–20.00)	0.235
	Pedicles & neurovascular bundle	19.00 (18.00–20.50)	19.00 (18.00–19.00)	0.415
	Urethrovesical anastamosis	**20.00 (19.50–21.00)**	**18.00 (18.00–20.00)**	**0.013**
	Overall	**20.00 (19.00–20.75)**	**18.67 (18.17–19.17)**	**0.100**
GERT (number of errors)	Bladder drop	8.00 (4.50–10.00)	5.00 (2.50–7.00)	0.094
	Endopelvic dissection	2.00 (1.00–4.00)	2.00 (0.00–4.00)	0.352
	Bladder neck	**2.00 (1.00–3.00)**	**5.00 (2.00–12.00)**	**0.004**
	Seminal vesicles	9.50 (6.00–12.75)	6.00 (3.50–8.00)	0.087
	Pedicles & neurovascular bundle	9.00 (6.00–12.00)	8.50 (6.75–10.25)	1.000
	Urethrovesical anastamosis	4.00 (1.50–4.50)	4.00 (2.00–7.00)	0.415
RACE (score /30)	Urethrovesical anastamosis	**25.00 (22.50–26.50)**	**22.00 (21.00–23.00)**	**0.002**

Bold values indicates statistical significance (p<0.05). GEARS: global evaluative assessment of robotic skill; GERT: generic error rating tool; IQR: interquartile range; RACE: robotic anastamosis competency evaluation.

defined as patient use of more than a single precautionary pad. A blinded observer with expertise in intraoperative video analysis evaluated clinically relevant steps of RARP using the Global Evaluative Assessment of Robotic Skill (GEARS),[2] Robotic Anastomosis Competency Evaluation (RACE),[3] and the Generic Error Rating Tool (GERT).[4] Mann Whitney U tests were done to look significant differences in predictor variables between cases and controls (two-tailed, p≤0.05).

Results: 17 patients deemed to be incontinent at three months were matched for age, preoperative International Prostate Symptoms Score (IPSS), use of posterior/anterior hitch, prostate weight, and position of the case on the surgeon's learning curve. Statistically significant differences between cohorts were detected in GEARS score at the bladder neck and urethrovesical anastomosis steps, and overall GEARS and RACE scores (Table 1). There were also a greater number of errors committed at the bladder neck in the incontinent patient cohort.

Conclusions: Our study is the first that points to a link between surgeon technical performance and functional outcomes in RARP. While this single surgeon, patient-matched, case-control design limits confounding, multi-institutional prospective studies form the basis of future research in this area. This study sets the stage for a novel method of assessing surgical quality in urology.

References:

1. Birkmeyer JD, Finks JF, O'Reilly A, et al. Surgical skill and complication rates after bariatric surgery. *N Engl J Med* 2013;369:1434-42. https://doi.org/10.1056/NEJMsa1300625
2. Goh AC, Goldfarb DW, Sander JC, et al. Global evaluative assessment of robotic skills: Validation of a clinical assessment tool to measure robotic surgical skills. *J Urol* 2012;187:247-52. https://doi.org/10.1016/j.juro.2011.09.032
3. Raza SJ, Field E, Jay C, et al. Surgical competency for urethrovesical anastomosis during robot-assisted radical prostatectomy: Development and validation of the robotic anastomosis competency evaluation. *Urology* 2015;85:27-32. https://doi.org/10.1016/j.urology.2014.09.017
4. Bonrath EM, Zevin B, Dedy NJ, et al. Error rating tool to identify and analyse technical errors and events in laparoscopic surgery. *Br J Surg* 2013;100:1080-8. https://doi.org/10.1002/bjs.9168

IPD-10.03

The impact of the Choosing Wisely campaign on low-value urological practices

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Introduction: The ability of the urology Choosing Wisely campaign to change physician behaviour is unknown. Our objective was to determine if there was an increase in testosterone testing prior to supplementation, and a decrease in the use of bone scans with low-risk prostate cancer patients.

Methods: Several administrative data sources from Ontario, Canada were used. First, a cohort of men >66 years of age who received their first prescription for testosterone supplementation between 2008 and 2016 were identified. The primary outcome was the proportion of men undergoing a serum testosterone level in the 90 days prior to their prescription. Second, a cohort of men with a new diagnosis of prostate cancer between 2008 and 2015 were identified. The primary outcome was the proportion of men undergoing a bone scan 90 days after prostate cancer diagnosis. Piece-wise linear regression was used to evaluate for a significant change after the intervention date of November 2014 (date of CUA Choosing Wisely campaign).

Results: We identified 11 496 men who had their initial prescription for testosterone filled during the specified time period. At the beginning of the study period, serum testosterone measured in an estimated 43% of men, and this increased in the pre-intervention time period by 0.2% per month; there was no significant change in this trend (p=0.27). We identified 60 209 men with a new diagnosis of prostate cancer. At the beginning of the study period, bone scans were performed in an estimated 18% of men undergoing active surveillance, and this decreased by 0.05% per month in the pre-intervention time period; there was no significant change in this trend (p=0.07).

Conclusions: In Ontario, there was no evidence of a significant change in two practice patterns that were the subject of the Choosing Wisely urology recommendations. Further mechanisms for translating these and future recommendations into behaviour change may be necessary.

IPD-10.04

Creating a market-driven academic clinical department: Innovative approaches to delivering value to urology patients

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Introduction: There is a lack of use of business principles in the provision of healthcare. In the urological literature, many have explored patient satisfaction and quality of life, but little research has assessed what patients and providers value in the transaction of their care. We sought to understand what patients value when they receive urological care and compare this to the provider perspective.

Methods: A purposive sample of non-cancer urology outpatients aged 18–65 years referred to Queen's urology outpatient clinics were considered for enrolment in the study group. Willing participants completed a questionnaire following their clinic appointment, asking to list things they value in receiving urological care. A similar questionnaire was administered to members of the healthcare team. The questionnaires were analyzed using thematic analysis.

Results: In total, 42 patients and 16 healthcare providers completed questionnaires. Patients identified eight recurring themes in what they value when receiving urological care, with the three most commonly cited being 1) communication (n=26); 2) accessibility (n=23); and 3) relationship with care provider (n=22). Interestingly, only one patient identified quality care as being highly valued in receiving urological care. Healthcare providers identified seven recurring themes in what they value in providing urological care, with the three most commonly cited being 1) work environment (n=9); 2) relationship with patient (n=8); and 3) treatment outcomes (n=6). Only two healthcare providers identified communication as being highly valued.

Conclusions: Both patients and their healthcare providers highly value their relationship with one another in the provision of urological care. Some important discrepancies among patients and their providers were identified. Separate focus groups with patients and providers will be carried out to ensure data saturation and to better elucidate identified discrepancies.

MP-10.01

Development and implementation of a continuing medical education program in Canada: Knowledge translation for renal cell carcinoma (KT4RCC)

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Study Groups: Kidney Cancer Research Network of Canada.

Introduction: An in-person multidisciplinary continuing medical education (CME) program was designed to address previously identified knowledge gaps regarding quality indicators of care in kidney cancer.

The objective of this study was to develop a CME program and determine if the program was effective for improving participant knowledge.
Methods: CME programs for clinicians were delivered by local experts (uro-oncologist and medical oncologist) in four Canadian cities. Participants completed knowledge assessment tests pre-CME, immediately post-CME, and three months post-CME. The test questions were related to topics covered in the CME program, including: prognostic factors for advanced disease, surgery for advanced disease, indications for hereditary screening, systemic therapy, and management of small renal masses.
Results: 52 participants attended the CME program and completed the pre and immediate post-CME tests. Participants attended in Ottawa (14; 27%), Toronto (13; 25%), Quebec City (18; 35%), and Montreal (7; 13%) and were staff urologists (21; 40%), staff medical oncologists (9; 17%), fellows (5; 10%), residents (15; 29%), and nurses (2; 4%). The mean pre-CME test score was 61% and mean post-CME test score was 70% (p=0.003). Only 21 (40%) completed the three-month post-CME test. Of those who completed the post-test, scores remained 10% higher than the pre-test (p=0.01). Variability in test scores were observed across sites and between French and English test versions. Urologists had the largest specialty-specific increase in knowledge at 13.8% (standard deviation 24.2; p=0.02).
Conclusions: The kidney cancer CME program was moderately effective in improving provider knowledge regarding quality indicators of kidney cancer care. These findings support continued use of this CME program at other sites.

MP-10.02
Evolving attitudes toward robotic surgery among Canadian urology residents

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Introduction: Robot-assisted laparoscopic surgery (RAS) has not been adopted as rapidly or widely in Canada as in the U.S. In 2011, Canadian urology residents felt that RAS represented an expanding field that could potentially negatively impact their training. We re-evaluate trainee exposure and attitudes to RAS in Canadian residency training five years later.
Methods: All Canadian urology residents were asked to participate in an online survey designed to assess current resident exposure to and perception of RAS.
Results: The response rate was 39% (61/157). 77% of residents reported being involved in at least one RAS procedure (52% in 2011), and the majority had exposure to <10 cases. For those in hospitals with access to RAS, 96% desired more console time, while only 50% of those without access wanted more console experience. Of all residents, 50% felt that RAS will become the gold standard in certain urological surgeries (34% in 2011), but only 28% felt that RAS would play an increasingly important role in urology (59% in 2011).
Conclusions: Despite an increase in exposure to RAS in residency programs over the past five years, console experience remains limited. Although these residents desire more access to RAS, many voice uncertainty as to the role of RAS in Canada. We cannot conclude whether RAS is perceived by residents to be beneficial or detrimental to their training nationwide. Moving forward in the robotic era, it will be important to either modify residency curricula to address RAS experience or to limit RAS to fellowship training.

MP-10.03
Assessment of urology postgraduate trainees' competencies in flexible ureteroscopic stone extraction

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Study Groups: Fonds de la Recherche en Santé du Quebec (FRSQ).
Introduction: We sought to assess flexible ureteroscopic stone-extraction skills of urology postgraduate trainees (PGTs) at an Objective Structured Clinical Examination (OSCE) and to determine whether previous experience in the operating theatre or practice on the simulator correlated with performance.
Methods: After obtaining ethics approval, PGTs from postgraduate years (PGYs) 3–5 were recruited from all four Quebec urology training programs during an OSCE. After a short orientation to the UroMentor simulator, PGTs were asked to perform Task 10 for 15 minutes, where two small stones from the left proximal ureter and renal pelvis were extracted using a basket. Competency of PGTs in performing the task was assessed using objective assessment from the simulator and subjective evaluations using Ureteroscopy-Global Rating Scale (URS-GRS). Simulator performance reports and URS-GRS scores were analyzed.
Results: 30 PGTs (nine PGY-3, 11 PGY-4, 10 PGY-5) participated in this study. PGTs had performed a mean of 277.9 cystoscopies, 55.9 semi-rigid and 45.7 flexible ureteroscopies prior to the study. Mean URS-GRS score of the participants was 20.0 ± 4.4, mean operative time was 10.9 ± 2.1 minutes, mean fluoroscopy time was 7.0 ± 4.9 seconds, and mean number of traumas was 10.8 ± 3.8. Using norm-referenced method with three experts, cutoff score of 19 on the URS-GRS was determined to indicate competency. 60% (18/30) of PGTs were competent. Mean URS-GRS score of the eight PGTs who had practiced on the simulator was significantly higher than the mean score of those who did not practice (24.6 ± 3.0 vs. 18.3 ± 3.6; p<0.001). Previous experience in the operating theatre and PGY level did not correlate with performance.
Conclusions: This study confirmed the feasibility of incorporating the UroMentor at OSCEs to assess competency of urology PGTs in ureteroscopic stone-extraction skill. PGTs who practiced on the simulator scored significantly higher than those who did not practice.

MP-10.04
Teaching and evaluation of basic urodynamic skills Quebec urology resident experience

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Introduction: Recognizing the growing role of urodynamics (UDS) in advanced urology, residency programs have rapidly incorporated it into their training curriculum. However, there is no consensus on the best methods of teaching UDS application. Therefore, we aimed to determine the most appropriate teaching method with objective evaluation to enhance urodynamic skills in order to improve quality of teaching and patient care.
Methods: Urology residents (n=20) were randomized according to postgraduate year and training institution to either review a video training module[1] or a teaching document,[2] on UDS, prior to an objective structured clinical examination (OSCE). Participants were given a basic questionnaire evaluating age, training level, adequacy of training, and estimated UDS interpretation proficiency. The OSCE contained 12 UDS tracings with questions assessing level of certainty. Two urologists independently established the correct answers. Two blinded, independent graders scored each UDS question to determine competency (0=incorrect, 1=partially correct, 2=correct). Certainty was scored on a scale of 0–4 (0 representing a guess and 4 representing 100% certainty).

Results: The median self-reported proficiency was 5 out of 10, mean total score was 13.3 of 24, and overall certainty was 27 of 48. There was significant difference in overall competency between both groups (video: 15.1 ± 2.08, document: 11.4 ± 2.41; p<0.01). Also, the video training module group achieved a higher score on overall certainty (30.7 ± 4.99 vs. 22.4 ± 10.3; p<0.05). When analyzing each diagnosis, we found that the mean score for correctly identifying proper calibration and bladder outlet obstruction was significantly higher in the video training module group, while approaching significance for detrusor sphincter dyssynergia (p<0.05), respectively. Overall competency was significantly correlated with self-reported proficiency (r=0.502; p<0.05), total certainty (r=0.531; p<0.05), and overall urodynamic experience (r=0.503; p<0.05).
Conclusions: A urodynamic video training module improved residents UDS knowledge and interpretation skills. These findings highlight the need to incorporate multimedia teaching for UDS interpretation into urology curriculum. Future research should focus on curriculum standardization and optimal learning methods to improve UDS competency.

MP-10.05
Using the generic error-rating tool in open and robotic partial nephrectomy: A feasibility study

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Study Groups: Urology Care Foundation AUA 2017 Resident Research Award.
Introduction: Surgery is a unique field of medicine, as one's technical skill can affect patient outcomes.[1] We have developed and validated the generic error-rating tool (GERT), a tool that measures intra-operative technical errors.[2,3] Using the GERT, it is now possible to objectively assess relationships between surgical errors, adverse events, postoperative outcomes, and operative costs. In this study, we sought to adapt the GERT for use in open and robotic radical nephrectomy (OPN and RPN) and examine the frequency and types of errors in OPN and RPN.
Methods: This prospective, multicentre, observational study collected intra-operative video feed from OPNs and RPNs. Using the existing GERT, procedural steps and error types were modified to include those unique to open and robotic surgery. Videos were rated by blinded reviewers using the Objective Structures Assessment Tool (OSAT) and the modified GERT using Studiocode©. Timelines were analyzed to identify the total number and types of errors.
Results: Of a planned sample of 70, 60 videos have been collected. Seven videos (RPN=5, OPN=2) from six different surgeons have been rated using the modified GERT. For both surgical modalities, bleeding was the most common event resulting from an error. Overall, RPN had a fewer average number of errors (n=153) and longer average procedure time (177 minutes) than OPN (n=157 and 132 minutes, respectively). One RPN was converted to radical nephrectomy due to failed renorrhaphy. OPN had greater number of severe bleeding episodes (both OPN had two episodes/case) than RPN (one case had one severe bleeding episode). The average total number of errors/minute was 0.87 for RPN and 1.18 for OPN.
Conclusions: Preliminary data suggest that GERT assessment may be feasible to quantify errors in OPN and RPN. Linkage to hospital data will allow for assessment of the relationship between intraoperative errors, postoperative complications, and treatment costs.
References:
1. Birkmeyer JD, Finks JF, O'Reilly A, et al. Surgical skill and complication rates after bariatric surgery. *N Engl J Med* 2013;369:1434-42. https://doi.org/10.1056/NEJMsa1300625
2. Bonrath EM, Zevin B, Dedy NJ, et al. Error-rating tool to identify and analyze technical errors and events in laparoscopic surgery. *Br J Surg* 2013;100:1080-8. https://doi.org/10.1002/bjs.9168
3. Husslein H, Shirreff L, Shore EM, et al. The generic error-rating tool: A novel approach to assessment of performance and surgical education in gynecological laparoscopy. *J Surg Educ* 2015;72:1259-65. https://doi.org/10.1016/j.jsurg.2015.04.029

MP-10.06
Outcomes of current Canadian Urological Association asymptomatic microscopic hematuria guidelines

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Introduction: Asymptomatic microscopic hematuria (AMH) is often initially observed in primary care settings and referred to urologists. Based on the 2008 Canadian Urological Association (CUA) guideline, patients over 40 years old, or with risk factors for urothelial cell carcinoma (UCC) are investigated with upper tract imaging, urine cytology, and cystoscopy. Our objective is to assess a cohort undergoing investigation for AMH and identify the incidence of lower tract pathology using current Canadian guidelines.
Methods: We undertook a non-randomized, hypothesis-generating, retrospective review of 420 adult patients referred to two urologists in Edmonton, AB for completion of their hematuria workup from June 2006 to 2016. Patient characteristics, UCC risk factors, investigation, and screening outcomes were added to an encrypted REDCap database.
Results: 420 patients were reviewed with 210 AMH patients added to our database. 82/210 (39%) smoked in the past 10 years, with 20% current smokers at consultation. Only 3% had other UCC risk factors, none having UCC detected. 11/210 (5%) had atypical urine cytology, none with UCC. Imaging detected abnormalities in 3% of patients with two bladder masses seen, one whose cystoscopy was normal. 7% of cystoscopies were abnormal, including the following surgical etiologies: bladder tumour, urethral stricture, bladder calculi, and severe benign prostatic hyperplasia (BPH). Of the two bladder masses on cystoscopy, pathology revealed one non-invasive papillary UCC low grade and one fibrosis/chronic inflammation, both smokers >40 years old. No patient had new pathology detected on re-evaluation after initial negative workup. Overall, 95% of patients completed evaluation as per the guideline. The incidence of clinically and surgically significant pathology was 9/204 (4.5%).
Conclusions: At our centre, adherence to the CUA guideline appears to appropriately screen and evaluate patients who may require intervention. Additionally, we identified potential areas of guideline improvement.

MP-10.07
The lotus catheter: A preliminary report on a novel bladder catheter

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Introduction: The Foley catheter design has several limitations due to the presence of a balloon. In addition to trauma related to inflation in the urethra with placement or accidental removal, the Foley catheter has also been reported to allow for high residual bladder volumes (PVR), and this has been attributed to increased risk of urinary tract infections (UTI).[1,2] The Lotus catheter has a deployable Malecot-like soft-winged retention mechanism, not only improving urinary drainage by allowing the lumen to rest at the bladder neck, but also safety due to compressibility in the urethra (Figs. 1, 2; available at https://cua.guide/). The purpose of this study is to determine the performance of this catheter in a clinical setting.
Methods: Patients required less than five days of urinary drainage between January 1, 2015 and June 1, 2015 underwent placement of a Lotus catheter and data were collected prospectively in an IRB approved database. Following insertion of the Lotus catheter, data were collected with regards to ease of placement, removal, and patient discomfort. A post catheter residual volume was obtained using a bladder scanner.[3]
Results: 33 patients underwent Lotus catheter placement, seven male and 26 female. All inserters stated the ease of insertion was 7/7. No gross hematuria was reported with any insertion and the median PVR following catheter insertion was 0 cc (0–15 cc) (Table 1). The median discomfort level at the time of Lotus removal was 2/10 (Table 2). One catheter was dislodged without deactivation with no resulting hematuria or patient discomfort. No UTIs were detected in all patients.
Conclusions: To our knowledge, this is the first study evaluating the Lotus catheter in a clinical setting. Data shows the Lotus catheter is safe, easily

MP-10.07. Table 1. Lotus catheter Insertion results	
Mean time for insertion (sec)	4
Mean discomfort rating (#/10)	0
Mean ease of insertion (#/7)	7
Gross hematuria	
Present	n=0 (0%)
Absent	n=50 (100%)
Complications	None

inserted, and drains the bladder with minimal residuals and the additional benefit of limiting urethral trauma with accidental removal. The Lotus catheter is a great option for patients with uncomplicated urethra or require short-term catheter placement.

References:

1. Leuck AM, Wright D, Ellingson L, et al. Complications of Foley catheters--is infection the greatest risk? *J Urol* 2012;187:1662-6. https://doi.org/10.1016/j.juro.2011.12.113
2. Dellimore KH, Helyer AR, Franklin SE. A scoping review of important urinary catheter induced complications. *J Mater Sci Mater Med* 2013;24:1825-35. https://doi.org/10.1007/s10856-013-4953-y
3. Haylen BT, Frazer MI, MacDonald JH. Assessing the effectiveness of different urinary catheters in emptying the bladder: An application of transvaginal ultrasound. *Br J Urol* 1989;64:353-6. https://doi.org/10.1111/j.1464-410X.1989.tb06041.x

MP-10.08

Development and validation of an inexpensive 3D-printed bladder model for urethrovesical anastomosis training in laparoscopic and robot-assisted radical prostatectomy

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Introduction: Minimally invasive urological surgeries are associated with steep learning curves. With competency-based training on the horizon, and the recent reduction of resident work hours, surgical educators have shifted some training to a simulation environment.[1] To improve surgical skills education at our centre, we developed a 3D-printed bladder model for urethrovesical anastomosis (UVA) laparoscopic and robotic training. Our objective was to further validate this model for laparoscopic training.

Methods: The 3D-printed model is produced using a proprietary polymer that mimics the cutting and suturing characteristics of human tissue, with dimensions that approximate the anatomy of the human bladder and urethra. We surveyed urology residents, fellows, and staff after they completed a laparoscopic training course in which they performed a simulated UVA (Fig. 1; available at https://cua.guide/). All participants completed an exit questionnaire that assessed the face and content validity of the model using a five-point Likert scale (1=strongly disagree, 5=strongly agree) in six domains.

Results: Residents, fellows, and staff from seven urology programs completed the course (n=24). For face validity, participants rated an overall mean of 3.6 on the anatomical realism domain and 3.8 on overall task-based usefulness. Task-specific realism scores were 4.4 for suturing, knot-tying, and cutting and 4.1 for the UVA task as a whole. For content validity, participants rated an overall mean of 4.3 on usefulness of the model as a training tool and 4.4 on improving operative technique. Participants strongly believed that the "skills learned on the model will transfer to the operating room" (4.1) and that the "model should be incorporated into the training curriculum" (4.3).

Conclusions: We established that this novel, low-cost model ($14 USD/model) has both face and content validity for robotic and laparoscopic UVA training within this sample and can can be incorporated into surgical simulation programs.

MP-10.07. Table 2. Lotus catheter removal results	
Mean time for removal (sec)	3
Mean discomfort rating (#/10)	2
Ease of removal (#/7)	7
Mean PVR after removal	4.8 mL
Complications	n=3 (6%)
Accidental removal	n=2 (4%)
Antispasmotic required	n=1 (2%)

PVR: post-void residual.

Reference:

1. Scott D, Cedan J, Pugh C, et al. The changing face of surgical education: Simulation as the new paradigm. *J Surg Res* 2008;147:189-93. https://doi.org/10.1016/j.jss.2008.02.014

MP-10.09

Implementing an acute care urology model of care at a large community teaching hospital in Ontario

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Introduction: There has been a rapid gain in popularity of the acute care surgery (ASC) model in general surgery as the standard model for delivering emergency surgical care across Canada.[1] Results from the literature show this model to be effective in improving patient care and surgeons report an improved balance between time spent on call and time available for their elective practices.[2-4] To our knowledge, North York General Hospital (NYGH) is the first Canadian hospital to implement an acute care urology (ACU) model of care and create a full-time "acute care urologist" position. We aim to describe this innovative approach to urological care.

Methods: In 2015, NYGH opened 1.5 days/week of dedicated urgent urological operating room (OR) time, with the aim of reducing the number of urgent cases being performed after hours. This additional time was divided equally between the five urologists with patient care shared to allow access for urgent cases. In July 2016, NYGH decided to enhance the management of urgent patients with the recruitment of an acute care urologist and creation of a rapid referral ACU clinic. The goal was to help manage the large number of consultations from NYGH's high-volume emergency department (ED). With a hospital-based practice, the acute care urologist is able to see inpatient consults in a timelier manner and patients referred are seen within 48 hours of ED visit. Those who require urgent operative care are prepared for the OR that week.

Results: The ACU model of care has had a positive impact from a urologist point of view and it has improved patient flow metrics (decreased ED length of stay, time to referral for consultation and fewer ED repeat visits). Urgent surgical cases are performed during daytime operative hours and the financial impact analysis on the hospital has been neutral to favourable.

Conclusions: We believe this model may be adapted by other Canadian community hospitals and can help address the issue of young urologist employment with the creation of acute care urologist positions.

References:

1. Hameed SM, Brenneman FD, Ball CG, et al. General surgery 2.0: The emergence of acute care surgery in Canada. *Can J Surg* 2010;53:79-83.
2. Faryniuk AM, Hochman DJ. Effect of an acute care surgical service on the timeliness of care. *Can J Surg* 2013;56:187-91. https://doi.org/10.1503/cjs.022911
3. Helewa RM, Kholdebarin R, Hochman DJ. Attending surgeon burnout and satisfaction with the establishment of a regional acute care surgical service. *Can J Surg* 2012;55:312-6. https://doi.org/10.1503/cjs.000611
4. Qureshi A, Smith A, Wright F, et al. The impact of an acute care emergency surgical service on timely surgical decision-making and emergency department overcrowding. *J Am Coll Surg* 2011;213:284-93. https://doi.org/10.1016/j.jamcollsurg.2011.04.020

MP-10.10

Canadian urology residents have limited exposure to medical and radiation oncology in their training

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Introduction: There are significant differences in residency experiences and teaching in oncology among Canadian urology residents. We sought to identify what training in medical and radiation oncology is available for residents and to identify any perceived training deficiencies.

Methods: Over a five-month period in 2016, 190 residents and fellows enrolled in Canadian urology residency training programs were invited to participate in the study. Active participants completed an online questionnaire addressing the training they received.

Results: The overall response rate was 32%. 87% of respondents were aged 26–35 years and 76% were male. 23% were fellows and 17%, 20%, 10%, 17%, 12% were first-, second-, third-, forth-, and fifth-year residents, respectively, with a median of four (range 1–9) respondents from each training program. 95% of respondents had academic half-day as part of their training. 61% had radiotherapy, 71% had hormonal/endocrine therapy, and 51% had chemotherapy teaching as part of their half-day. Despite this, most respondents indicated their main exposure to chemo- and radiation therapy came from academic half-day or informal teaching in urology clinics. 41%, 29%, 8%, and 2% of participants have mandatory rotations in medical, radiation, or pediatric oncology and palliative care, respectively. In medical and radiation oncology, 32% and 24% will complete 3–4-week rotations and only 6% of respondents have/will use voluntary elective time in these fields. Most voluntary electives were of 1–2 weeks duration. Despite this, a majority of respondents felt at least one week of exposure to radiation and/or medical oncology was appropriate (Fig. 1).

Conclusions: Most of the limited exposure that urology residents have to medical and radiation oncology is through didactic teaching despite a desire among current urology trainees to have clinical exposure in these areas. Moving forward, urology residency programs should consider integrating medical and radiation oncology rotations into residency.

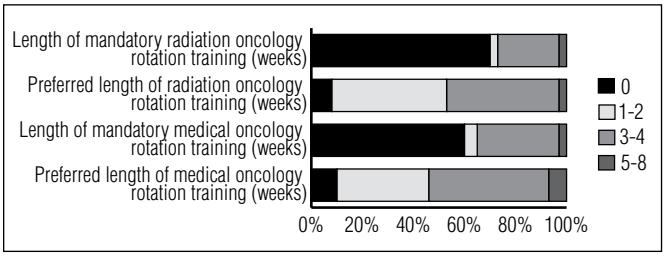

Fig. 1. MP-10.10. Current and preferred length of radiation and medical oncology training among residents.

MP-10.11

A novel cadaver prep for use in urological skills training

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Introduction: Surgical simulation training is demonstrating a rising trend across residency programs. Human cadavers provide an anatomically realistic training model; however, traditional cadaver preps may lack tissue quality. Herein, we describe a novel cadaver prep, the Halifax Clinical Cadaver, which has not been described in the literature. The objective of this study is to evaluate the efficacy of the cadaver at providing a suitable anatomic model for urological skills training.

Methods: A voluntary questionnaire was presented to urology residents following each skills training session, in which the Halifax Clinical Cadaver was used. Sessions involved open and laparoscopic procedures, including: radical cystectomy, groin dissection, laparoscopic radical nephrectomy, percutaneous nephrolithotomy (PCNL), prostatectomy, and retroperitoneal pelvic lymph node dissection (RPLND). Survey questions were comprised of both rating scale and open-ended questions. Rating scale questions were: "How useful would you rate the cadavers for skills training? (1–5, 1=useless; 5=very useful)" and "How realistic or life-like do you find the cadavers? (1–5, 1=poor; 5=excellent)". Responses were collected anonymously.

Results: Questionnaires were filled out for three separate skills training sessions (Session A - PCNL; Session B - prostatectomy, cystectomy, RPLND; Session C - radical cystectomy, groin dissection, and laparoscopic nephrectomy). Questionnaires were completed by seven, six, and three residents for Sessions A, B, and C, respectively. Average rating for usefulness of cadaver for skills training was 4.9/5. Average rating for life-likeness of cadavers was 4.8/5. A commonly cited strength of the cadaver was realistic anatomy, whereas a common weakness was smell.

Conclusions: The Halifax Clinical Cadaver Prep offers life-like simulation for use in both open and laparoscopic surgical skills training. Further studies are needed to evaluate the efficacy of this novel prep compared with conventional cadaver preps.

MP-10.12

A new wave of urologists: Graduating Canadian urology residents' practices of and attitudes towards social media

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Introduction: Social media (SM) are ubiquitous in society; however, barriers to their integration in medicine exist. As SM's role in new Canadian urologists' medical practice is unknown, we sought to understand graduating Canadian urology residents' practices of and attitudes towards SM.

Methods: An anonymous, cross-sectional, self-report questionnaire was given to all graduates (n=100) from Canadian urology residency programs in 2012, 2014, and 2016. The survey was close-ended and employed five-point Likert scales to assess respondents' SM engagement and perceptions towards SM use. Descriptive, correlative, and Fisher's exact test statistics were used to analyze responses.

Results: All 100 (100%) surveys were completed, with most (92%) reporting SM use. Email (100% and 83% frequent personal and professional use, respectively) and text messaging (97% and 83%) were the most frequently used services. Personal use of video uploading/sharing, wikis, and online presentation banks significantly increased, whereas professional use of instant messaging and wikis significantly increased ($p<0.05$). Facebook™ (73%) and YouTube™ (65%) were the most frequently used specific services. Most (76%) supported using SM to provide patients with static information. Those who desired a community-based practice showed more support for SM in coordinating office or department activities ($r=0.22$; $p=0.04$). Few (2–8%) were aware and had read guidelines and legislations regarding physician online practices; however, awareness of non-Canadian Medical Association and institutional SM policies significantly increased ($p<0.05$). Almost all (91%) agreed that physicians

must be careful with what they post. Some (33%) believed SM's integration in medicine will be possible, and many (73%) felt there will be novel solutions to medical-SM privacy issues.
Conclusions: Despite perceived barriers, new Canadian urologists use SM in their personal and professional lives frequently and demonstrate a cautious, yet optimistic outlook on the integration of SM in medicine.

MP-10.13
Publish and perish

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Introduction: It is an accepted axiom that academics must publish to be considered successful and open-source journals are quickly gaining traction in the scientific community as an effective way to disseminate important research. The open-access movement includes many successful, well-respected, and trustworthy operations, but has also spawned a plethora of journals, some predatory and others that appear to be amateurish, low-impact academic traps. We provide a first look at open-source journals, both reputable and predatory, specifically pertaining to urology.
Methods: A review of the email inbox of a single academic urologist was examined for journal article solicitations over a four-month span (September–December 2016). Journals were excluded if they did not pertain to urology. Journals were analyzed according to journal-centred (impact factor, number of documents published per year, cost of publication, total citations over three-year period, origin of journal) and author-centred (H index) metrics over one publishing year (2015).
Results: A total of 32 journals contacting a single academic urologist were included in this review. The majority of journals originated outside North America, with a mean publication cost of $1567 CAD. Analysis of journal-specific metrics show a wide range of journal H index (2–18), total documents published over one year (10–131), and number of citations per document (0.02–1.27). Some publications were found to make false claims of citation in related literature and have been listed in vetted academic databases.
Conclusions: Choices for open-source journal publication are rapidly increasing in the field of urology; however, all open-source journals are not all created equal. Publication in many of these journals will increase the risk of seeing academic careers perish rather than flourish.

Poster Session 11: Pediatrics
June 26, 2017; 0800–0930

IPD-11.01

Active surveillance for antenatally detected ureteroceles: Predictors of success

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Introduction: Ureteroceles are usually managed surgically; however, active surveillance (AS) has been shown to be an option. We sought factors predictive of success in selecting patients for AS with antenatally detected ureteroceles.

Methods: IRB approved retrospective review of infants with antenatally detected ureteroceles from 1990–2015. All were detected antenatally except for five incidentally diagnosed when imaged for non-urological indications. Post-natal ultrasound confirmed the diagnosis and voiding cystourethrogram (VCUG) documented vesicoureteral reflux (VUR) and/or bladder outlet obstruction (BOO). Patients with BOO were excluded. Renal scans were performed when indicated. Patients on AS were placed on antibiotic prophylaxis. Outcomes were assessed by descriptive statistics. Kaplan-Meier curves were used to estimate median duration on AS in both single and duplex cohorts. Breakthrough febrile urinary tract infection (fUTI) and surgery were surveillance failures and were determined by Cox regression in the duplex system cohort.

Results: Study included 102 patients (64 female/38 male); 78 (76.5%) with duplex system and 24 (23.5%) single-system ureteroceles. Followup for single system ureteroceles ranged from 100 days to 11.2 years. 20% of single system ureteroceles failed AS. Median followup for duplex systems was 1.3 years (range 7 days–17.2 years. In the duplex cohort, 68% failed AS. Regression analysis of duplex system ureteroceles showed male gender (hazard ratio [HR] 1.8; 95% confidence interval [CI] 1.0–3.3; p=0.037), or fUTI (HR 3.0; 95% CI 1.7–5.4; p=0.001) was predictive of intervention. For fUTI, ipsilateral lower moiety or contralateral hydroureter (odds ratio [OR] 9.5; 95% CI 1.2–71.7; p=0.028) was predictive, while VUR was not (OR 0.35; 95% CI 0.12– 1.01; p=0.054).

Conclusions: Single-system ureteroceles are ideal for AS. AS for duplex system ureteroceles is successful in 30% of patients — primarily females without lower moiety or contralateral hydroureter. Males are at higher risk for failure. Careful long-term followup of AS patients is mandatory.

IPD-11.02

Pediatric pyeplopasty rate and outcomes are stable over last 20 years in Ontario

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Introduction: Pediatric pyeloplasty (PP) is a common pediatric urological procedure with a standard technique and expected outcomes. The purpose of this study was to determine if there was an association between surgical volumes and outcomes in children undergoing PP and to assess trends over a 20-year period in Ontario.

Methods: A population-based cohort study of patients undergoing primary PP at four pediatric centres in Ontario between 1993 and 2012 was carried out using several linked databases held at the Institute for Clinical Evaluative Sciences. Patient demographics, redo-pyeloplasty rate, other secondary interventions, and trends of outcomes in four five-year time periods were afnalyzed using standard statistical methods.

Results: A total of 1714 patients undergoing primary PP were included in this study. The rate of PP has been stable in Ontario during this 20-year period (85.7/year; p≥0.05). There was a significant difference in annual PP volume between institutions (21.43 ± 16.94; p<0.05) and annual surgeon volume (4–21/year during 1993–97 decreasing to 4–11/year in 2008–2013; p≤0.05). Following PP, 91.1% of patients did not require any other surgical intervention. The overall rate of redo PP was 4.0%, with no statistically significant difference between institutions and over the duration of the study (p>0.05). There was no significant difference between institutions in the rate of secondary intervention, but the type of secondary intervention was different. The introduction of laparoscopic PP did not affect redo PP or secondary intervention rates (p>0.05).

Conclusions: This study demonstrates that rates and outcomes of PP are stable over a 20-year period in Ontario. Institutional and surgeon volumes do not impact results, confirming that PP is a true indicator operation for pediatric urologists. Secondary interventions have differing rates, suggesting alternative practice pathways and possibly a different complication profile.

IPD-11.03

Voiding cystourethrogram and antibiotic prophylaxis for prenatal hydronephrosis: Surprising results from a survey of Society of Fetal Urology members' practice patterns

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Introduction: Voiding cystourethrogram (VCUG) may be ordered in infants during workup of prenatal hydronephrosis (HN) or after febrile urinary tract infection (fUTI). Definitive guidelines regarding VCUG indications and prescription of continuous antibiotic prophylaxis (CAP) are lacking, resulting in a diverse clinical practice. This study aimed to explore current practice patterns among pediatric urologists.

Methods: An online survey was distributed to Society of Fetal Urology (SFU) members to assess practice patterns surrounding VCUG and CAP use in infants. To ensure face and content validity, the survey was developed by experts in the field and piloted locally. Anonymous responses were analyzed according to HN etiology (isolated HN vs. hydroureteronephrosis [HUN]) and grade (low vs. high SFU), gender and circumcision status, as well as the use of antibiotics for prevention of post-VCUG UTI.

Results: Response rate was 37% (109/297), with 86 (79%) respondents coming from an academic setting. No difference was observed regarding use of CAP or VCUG indications for unilateral vs. bilateral HN or between genders/circumcision status. In contrast, regardless of HN etiology and gender, an expected difference in CAP use was observed between low- (SFU I/II) vs. high-grade HN (SFU III/IV) (p<0.001). Most respondents recommended CAP and VCUG to infants with high-grade HUN (Table 1). For infants with their first fUTI and a normal ultrasound (US), we observed that more respondents would order VCUG for males (74%) and females (77%) 0–2 months old compared to male (54%) and female (53%) infants 2–24 months old

IPD-11.03. Table 1a. Prescription patterns for continuous antibiotic prophylaxis, n=109 (% of affirmative responses)

Gender	HN etiology	SFU I/II	SFU III/IV	p
Circumcised male	Unilateral isolated HN	6 (6)	40 (37)	<0.001
	Bilateral isolated HN	12 (11)	55 (51)	<0.001
	Unilateral HUN	38 (35)	80 (73)	<0.001
	Bilateral HUN	45 (41)	84 (77)	<0.001
Uncircumcised male	Unilateral isolated HN	12 (11)	53 (49)	<0.001
	Bilateral isolated HN	23 (21)	64 (59)	<0.001
	Unilateral HUN	50 (46)	86 (79)	<0.001
	Bilateral HUN	56 (51)	85 (78)	<0.001
Female	Unilateral isolated HN	8 (7)	59 (54)	<0.001
	Bilateral isolated HN	18 (17)	70 (64)	<0.001
	Unilateral HUN	52 (48)	91 (84)	<0.001
	Bilateral HUN	53 (49)	92 (84)	<0.001

HN: hydronephrosis; HUN: hydroureteronephrosis; SFU: Society for Fetal Urology.

IPD-11.03. Table 1b. Prescription patterns for voiding cystourethrogram, n=109 (% of affirmative responses)

Gender	HN etiology	SFU I/II	SFU III/IV	p
Male	Unilateral isolated HN	11 (10)	79 (73)	<0.001
	Bilateral isolated HN	31 (28)	92 (84)	<0.001
	Unilateral HUN	69 (63)	98 (90)	<0.001
	Bilateral HUN	77 (71)	102 (94)	<0.001
Female	Unilateral isolated HN	13 (12)	75 (69)	<0.001
	Bilateral isolated HN	30 (28)	86 (79)	<0.001
	Unilateral HUN	74 (68)	97 (89)	<0.001
	Bilateral HUN	73 (67)	100 (92)	<0.001

HN: hydronephrosis; HUN: hydroureteronephrosis; SFU: Society for Fetal Urology.

(p<0.01). No significant difference was found when comparing VCUG indications for a first fUTI for male and female infants 0–2 and 2–24 months old with abnormal US. Over 90% of respondents indicated they would order VCUG regardless of gender or age for this cohort. Despite 85% of clinicians reporting that they had observed a UTI after VCUG, only 31 (28%) empirically treated to avoid a potential post-VCUG UTI.
Conclusions: This is the largest study to date assessing pediatric urology practice patterns in evaluating subtypes of prenatal HN. Despite being a common condition, our study demonstrates VCUG and CAP practice patterns vary substantially. Surprisingly, CAP use and VCUG indications were minimally affected by gender and HN laterality; however, their use was much more common in infants with high- vs. low-grade HN, as well as those with HUN compared to isolated HN.

IPD-11.04

Clinical outcomes of ureteral clipping for the treatment of low-functioning kidneys or non-functioning renal moieties associated with ectopic ureter or obstructive ureterocele

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Study Groups: Funding: RIL received a post-doctoral fellowship from CAPES Foundation, Brazil.
Introduction: The aim of our study is to evaluate clinical outcomes and hydronephrosis evolution after ureteral clipping for the treatment of low-functioning kidneys or non-functioning renal moieties associated with ectopic ureter or obstructive ureterocele.
Methods: We prospectively collected data on 25 consecutive patients (17 female, eight male) who underwent ureteral clipping between February 2011 and August 2016. Patients were divided in four groups: 1) duplex kidney with ectopic ureter (48%); 2) duplex with large ureterocele (16%); 3) duplex with progressive upper pole dilatation (12%); and 4) single-system low or non-functioning kidneys (24%) and followed postoperatively for clinical outcomes and trends in hydronephrosis of the ligated units over time.
Results: Median age at surgery was 67 months (range 5–205). Mean operative time was 106.6 ± 33.7 min (range 20–180) and length of stay 12.1 ± 7.7 hours. Immediate resolution of urinary incontinence was observed in all cases of duplex systems associated with ectopic ureters (10 patients). After a mean followup of 24.4 ± 14.7 months, 96% of the patients remained asymptomatic. No significant diferences were observed between the initial and last measures of pelvis anteroposterior (9 and 17 mm) and ureteral diameter (9.5 and 14 mm). All ureteroceles showed a significant decrease after clipping (27.2 ± 4 mm to 5.3 ± 9.2 mm; p=0.007). One patient (4%) developed pyonephrosis two months postoperatively and required a laparoscopic nephrectomy.
Conclusions: Ureteral clipping is a safe and effective treatment in this setting, with the obvious advantage of being a much simpler and quicker surgical approach over extirpative or reconstructive procedures.

IPD-11.05

Two-stage Fowler-Stephens orchidopexy for intra-abdominal testes: Factors influencing testicular outcome from a large, single-centre series

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Introduction: Two-stage Fowler-Stephens orchidopexy (FSO) for intra-abdominal undescended testes (UDT) allows for mobilization of the testicle to the scrotal position using an individualized patient approach.[1] Despite 152 publications since 1983, debate remains as to the ideal approach and factors that may be associated with poorer outcomes. This series aims to identify factors that influence outcomes after open and laparoscopic two-stage Fowler-Stephens orchidopexy.[2,3]

Methods: A retrospective review of 110 children (aged 1.12–12.98 years, median 2.7 years), who underwent two-stage FSO for 151 intra-abdominal testes (April 2006–August 2016) was undertaken. There were 100 open second-stage FSO, of which 30 were bilateral (21 synchronous; nine metachronous), and 51 laparoscopic second-stage FSO, of which 11 were bilateral (nine synchronous; two metachronous). The median interval to the second-stage procedure was 7.35 months (range 3.63–50.9 months). No child was lost to followup.

Results: Testicular ascent occurred in 3/151 cases (1.98%). Atrophy occurred in 16/151 (10.59%), including 11/110 (10%) unilateral and 7/41 (17.03%) bilateral intra-abdominal testes (p=0.26). Of the 30 bilateral testes brought to the scrotum synchronously, seven atrophied (23.3%) and none ascended. In the metachronous group, two (18.18%) atrophied and one (9.09%) ascended (Fisher's exact test: p=1.0 and p=0.26, respectively). Laparoscopic second-stage was not associated with superior testicular outcomes (p=0.264). A long detached vas deferens (p=0.0001) and a hypertrophied contralateral testicle (p=0.002) were associated with postoperative atrophy. Multivariate analysis showed no significant differences for age, type of surgery, or ethnicity.

Conclusions: This is the largest series of two-stage Fowler-Stephens orchidopexy to date. Successful outcomes were recorded in 135/151 (83.85%) testicles. Atrophy occurred in 10.59%. An abnormal vas deferens and contralateral hypertrophy were associated with poorer outcomes.

References:

1. Alagaratnam S, Nathaniel C, Cuckow P, et al. Testicular outcome following laparoscopic second stage Fowler-Stephens orchidopexy. *J Pediatr Urol* 2014;10:186-92. https://doi.org/10.1016/j.jpurol.2013.08.005
2. Casanova NC, Johnson EK, Bowen DK, et al. Two-step Fowler-Stephens orchiopexy for intra-abdominal testes: A 28-year, single-institution experience. *J Urol* 2013;190:1371-6. https://doi.org/10.1016/j.juro.2013.04.056
3. Alam A, Delto JC, Blachman-Braun R, et al. Staged Fowler-Stephens and single-stage laparoscopic orchiopexy for intra-abdominal testes: Is there a difference? A single-institution experience. *Urology* 2017;101:104-10. https://doi.org/10.1016/j.urology.2016.09.060

MP-11.01

Postoperative bleeding in children undergoing circumcision with ketorolac administration

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Introduction: Circumcision is the most common surgical procedure performed by pediatric urologists. Ketorolac has been shown to have an efficacy similar to morphine in multimodal analgesic regimens without the commonly associated adverse effects.[1,2] Concerns with perioperative bleeding limit the use of ketorolac as an adjunct for pain control in surgical patients (such as in pediatric tonsillectomies).[3,4] We sought to evaluate our institutional outcomes with respect to ketorolac and postoperative bleeding in circumcisions.

Methods: We retrospectively reviewed all pediatric patients undergoing circumcision from January 1, 2014 to December 31, 2015 at the Alberta Children's Hospital (ACH). Demographics, perioperative analgesic regimens, and bleeding events within and after 24 hours in postoperative care, emergency department (ED), and clinic were gathered through chart review.

Results: 475 patients undergoing circumcisions were studied at the ACH, including 149 (31%) who received ketorolac and 326 (69%) who were managed with standard analgesia. There was no significant difference in age between groups. There was a significantly higher incidence (p<0.001) of postoperative sanguineous drainage for ketorolac patients (95/149 [63.7%]) compared to the non-ketorolac group (151/326 [46.3%]). Patients receiving ketorolac were found to be more likely to return to the ED or clinic for bleeding (ketorolac group 16/149 [11%], non-ketorolac group 11/326 [3.3%]; p=0.001). There was no significant difference in the number of patients requiring postoperative admission or further surgical intervention.

Conclusions: Ketorolac patients had significantly more bleeding events requiring medical attention than standard analgesia patients after circumcision. Ketorolac patients had more postoperative sanguineous drainage and returned to the hospital more often. Although a promising analgesic, ketorolac requires additional investigation for safe use in circumcisions.

References:

1. Sutters KA, Levine JD, Dibble S, et al. Analgesic efficacy and safety of single-dose intramuscular ketorolac for postoperative pain management in children following tonsillectomy. *Pain* 1995;61:145-53. https://doi.org/10.1016/0304-3959(94)00166-C
2. Gunter JB, Varughese AM, Harrington JF, et al. Recovery and complications after tonsillectomy in children: A comparison of ketorolac and morphine. *Anesth Analag* 1995;81:1136-41.
3. Rusy LM, Houck CS, Sullivan LJ, et al. A double-blind evaluation of ketorolac tromethamine vs. acetaminophen in pediatric tonsillectomy: Analgesia and bleeding. *Anesth Analg* 1995;80:226-9.
4. Splinter WM, Rhine EJ, Roberts DW, et al. Preoperative ketorolac increases bleeding after tonisillectomy in children. *Can J Anaesth* 1996;43:560-3. https://doi.org/10.1007/BF03011766

MP-11.02

Value of voiding cystourethrogram (VCUG) in assessment of high-grade post-natal hydronephrosis

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Introduction: Despite vesicoureteral reflux (VUR) being generally more prevalent than ureteropelvic junction obstruction (UPJO), UPJO is the most common cause of moderate and severe hydronephrosis. Concomitant UPJO and VUR are uncommon, representing about 8–11% of patients diagnosed initially as UPJO that is usually low-grade VUR.[1] Kim et al stated that low-grade VUR coexisting with UPJO usually disappears after pyeloplasty.[2] Our hypothesis was that the absence of hydroureter (HU) in association with high-grade hydronephrosis is highly suggestive for primary UPJO and associated VUR would mostly be non-complicated. Hence, voiding cystourethrogram (VCUG) is not needed for primary assessment for these patients.

Methods: We retrospectively reviewed patients' charts who presented with antenatal hydronephrosis from 2008–2014 (Fig. 1). Excluded patients included those with urinary tract infection (UTI), neurogenic bladder, posterior urethral valve, ureterocele, multicystic dysplastic kidney, and patients with associated non-urological malformations. We reviewed ultrasound images and patients with Society of Fetal Urology (SFU) Grades 3 and 4 hydronephrosis with antero-posterior diameter (APD) ≥10 mm. The ureter was assessed and considered dilated if ureteral diameter was ≥4 mm. Moreover, VCUG studies, UTI incidence, and surgical reports were reviewed.

Results: The total number of included patients was 148 (164 units). 49% of units had Grade 3 hydronephrosis, while 51% had Grade 4. HU was

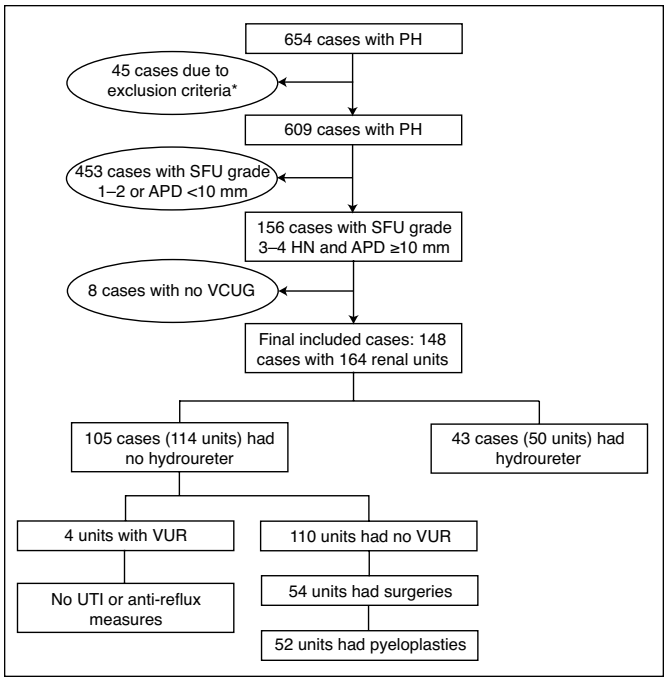

Fig. 1. MP-11.02. Demonstration of the study design. APD: anteroposterior diameter; HN: hydronephrosis; PH: postnatal hydronephrosis; SFU: Society for Fetal Urology. UTI: urinary tract infection; VCUG: voiding cystourethrogram; VUR: vesicoureteral reflux.

reported in 50/164 units, but was not detected in 114/164 units. VUR was diagnosed in 3.5% of units without HU; while it was detected in 38% of units with HU (p<0.001). VUR was diagnosed on the contralateral side in 4/105 patients with post-natal hydronephrosis (PH) without HU, while it was diagnosed in 10/43 patients with PH units with HU (p<0.001). During median followup of 25.9 months, none of units that had VUR without HU developed UTI or had surgical intervention (Table 1).

Conclusions: Our results showed that VCUG should be limited for patients with high-grade PH if associated with HU.

References:

1. Passerotti CC, Kalish LA, Chow J, et al. The predictive value of the first post-natal ultrasound in children with antenatal hydronephrosis. *J Pediatr Urol* 2011;7:128-36. https://doi.org/10.1016/j.jpurol.2010.09.007
2. Kim YS, Do SH, Hong CH, et al. Does every patient with ureteropelvic junction obstruction need voiding cystourethrography? *J Urol* 2001;165:2305-7. https://doi.org/10.1016/S0022-5347(05)66190-3

MP-11.03

Segmental vs. diffuse cortical thinning in Society of Fetal Urology Grade IV hydronephrosis patients: Do they have similar clinical outcomes?

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Introduction: Prior evidence has suggested that differential renal function (DRF) is systematically different between patients with segmental vs. diffuse parenchymal thinning. Our objective was to further explore this concept in our population of infants with Grade IV hydroneprosis (HN) with respect to differences in surgery and urinary tract infection (UTI) rates, anteroposterior diameter (APD) measurements, DRF, and HN resolution.

Methods: We reviewed our prospectively collected prenatal HN database of infants 0–18 months of age from 2008–2016 (n=549). We only included patients with Society of Fetal Urology (SFU) IV HN with no other uropathies (n=100). Sagittal ultrasound images were independently reviewed for each patient by three clinicians (agreement was measured by Kappa; K=0.8), assessing the degree of cortical thinning and categorized into two groups: IV-a: segmental; and IV-b: diffuse thinning. We compared baseline characteristics, including APD, age, HN etiology and surgery, UTI and resolution rates. HN resolution was defined as APD <10mm or SFU <1 at the last followup ultrasound. We carried out subgroup analyses, stratifying patients by etiology (ureteropelvic junction obstruction [UPJO]-like vs. megaureter) and surgical procedures (pyeloplasty vs. reimplant). Patient characteristics and clinical parameters were compared between groups using parametric and non-parametric tests.

Results: Of 100 patients, 73 were male, 85 had unilateral HN, with 42 showing segmental and 58 diffuse parenchymal thinning. Median age at presentation was 1.5 months (0–18) and mean followup was 32 + 24 months. No differences in baseline characteristics (gender, circumcision status, HN etiology, APD, and DRF) were observed between the groups (Table 1). Surgical intervention (29/42 [69%] vs. 40/58 [69%]; p=0.93) and UTI (5/42 [12%] vs. 6/58 [10%]; p=0.23) rates were similar for groups IV-a and IV-b, as well as DRF at last followup. Mean APD (9 + 6 vs. 13 + 10 mm; p=0.05) and HN resolution rates (17/42 [40%] vs. 13/58 [22%]; p=0.04) were significantly different for groups IV-a and IV-b at last followup. These differences remained statistically significant even after stratifying by HN etiology and surgery type.

MP-11.02. Table 1. Grades of VUR (per renal unit) in relation to dilated ureter and SFU grading system

	PHH			PHN		
SFU / VCUG	Grade 3	Grade 4	Total	Grade 3	Grade 4	Total
No reflux	16	15	31	53	57	110
Grade 1	0	2	2	4	0	4
Grade 2	1	0	1	0	0	0
Grade 3	2	0	2	0	0	0
Grade 4	4	5	9	0	0	0
Grade 5	1	4	5	0	0	0
Total renal units	**24**	**26**	**50**	**57**	**57**	**114**
Refluxing units	**8**	**11**	**19**	**4**	**0**	**4**

PHH: postnatal hydronephrosis with hydroureter; PHN: postnatal hydronephrosis with normal ureter; SFU: Society of Fetal Urology; VCUG: voiding cystourethrogram; VUR: vesicoureteral reflux

MP-11.03. Table 1. Baseline characteristics in of infants with Grade IV hydronephrosis

	Segmental (n=42)	Diffuse (n=58)	p
Age, months (median)	2 (0–18)	1.5 (0–12)	0.15
Gender			1.00
Male	30 (71)	43 (74)	
Circumcision status			0.14
Yes	9 (30)	6 (14)	
Etiology			0.29
UPJO-like	31 (73)	44 (76)	
POM	10 (24)	9 (16)	
UPJ+UVJ	1 (3)	5 (8)	
Mean APD at baseline	21 ± 10	23 ± 11	0.65
Renal scan, n (%)	41 (97)	57 (98)	0.48
Mean baseline function (%)	45 ± 11	48 ± 13	0.16
Mean T½ (mins)	46 ± 45	48 ± 68	0.86
DRF <40% baseline	10 (23)	9 (15)	0.33
Followup renal scan, n (%)	26 (64)	27 (47)	0.15
Mean followup function (%)	45 ± 12	48 ± 14	0.25
T½ (mins)	20 ± 23	21 ± 27	0.87
DRF <40% followup	6 (14)	2 (7)	0.11
APD last followup	9 ±6	13 ± 10	0.05
Resolved HN	17 (40)	13 (22)	0.05
Surgery	29 (69)	40 (69)	0.99
UTI	5 (12)	6 (10)	0.23
Maximum followup (months)	35 ± 24	30 ± 23	0.32

APD: anteroposterior diameter; DRF: differential renal function; HN: hydronephrosis; POM: primary obstructed megaureter; UPJO: ureteropelvic junction obstruction; UTI: urinary tract infection; UVJ: ureterovesical junction.

Conclusions: Diffuse vs. segmental thinning does not appear to be associated with reduced DRF, as previously suggested. Despite similar surgery and UTI rates, segregating SFU IV patients into these two subtypes helps predict HN resolution at last followup. This finding suggests potential value in expanding the SFU grading system to include subcategorization of Grade IV HN patients.

MP-11.04

Primary non-refluxing megaureter: Analysis of risk factors for spontaneous resolution and surgical intervention

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Introduction: The risk of febrile urinary tract infection (fUTI) in primary non-refluxing megaureter (PM) patients has been extensively studied in the literature; however, a paucity of information exists regarding risk factors for surgical intervention and spontaneous resolution. We sought to analyze data from our prospective PM cohort to determine risk factors that would predict surgery and resolution in this population.

Methods: Patients with PM were identified from our prospectively collected prenatal hydronephrosis (HN) database from 2008–2016. Primary outcomes included surgical intervention and resolution of ureteral dilation. Resolution was defined as ureteral dilation <7 mm at last followup. Age at presentation, gender, development of fUTI, HN grade (low [Society of Fetal Urology (SFU) I/II] vs. high [SFU III/IV]), anteroposterior diameter (APD) measurements and ureteral dilation at baseline and last followup were recorded. Univariate and multivariable analyses (binary logistic and Cox regressions) were performed to identify risk factors for surgery and spontaneous resolution.

Results: Of 101 patients, 86 (85%) were male and 80 (79%) had high-grade HN. Median age at baseline and last followup were 2 (0–23) and 29 (2–107) months, respectively. Overall, 23 (23%) patients underwent surgery at a median age of 22 (3–35) months. Mean ureteral diameter was larger in surgical patients vs. those treated non-surgically (14 ± 4 mm vs.11 ± 3 mm; p<0.01). Of the 78 (77%) non-surgical patients, 43 (55%) showed resolution of their ureteral dilation at a median age of 24 (4–56) months. Survival analysis demonstrated that 12 patients resolved by year 1, 22 by year 2, 30 by year 3, 40 by year 4, and 43 by year 5; however, when considering resolution as APD <10 mm, 62 (78%) children resolved their HN by last followup. Univariate and multivariable analyses (Table 1) revealed that high-grade HN at baseline, development of fUTI, and ureteric dilation ≥14 mm were significant risk factors for surgical intervention. Cox regression (Fig. 1) found that ureteral dilation <11 mm

MP-11.04. Table 1. Univariate and multivariable analysis of risk factors for surgical intervention

		Univariate		Multivariable	
	Surgery n=23 (%)	Total n=101	p	HR (95% CI)	p
Gender					
Male	20 (23)	86	1.00	Ref	0.67
Female	3 (20)	15		1.4 (0.3–7.2)	
HN grade					
Low-grade (I/II)	1 (5)	21	0.04	Ref	0.03
High-grade (III/IV)	22 (28)	80		12.8 (1.3–122.9)	
fUTI					
Yes	11 (46)	24	<0.01	Ref	<0.01
No	12 (16)	77		7.7 (2.2–26.1)	
Ureteral dilation					
<14 mm	12 (15)	78	<0.01	Ref	<0.01
≥14 mm	11 (48)	23		5.8 (1.8–18.8)	

CI: confidence interval; fUTI: febrile urinary tract infection; HN: hydronephrosis; HR: hazard ratio.

MP-11.04. Table 2. Univariate and multivariable analysis of risk factors for resolution

		Univariate		Multivariable	
	Resolution n=43(%)	Total n=101	p	HR (95% CI)	p
Gender					
Male	36 (42)	86	0.73	Ref	0.69
Female	7 (47)	15		1.2 (0.5–2.7)	
HN grade					
Low-grade (I/II)	13 (62)	21	0.04	Ref	0.19
High-grade (III/IV)	30 (38)	80		1.6 (0.8–3.0)	
Ureteral dilation					
<11 mm	23 (53)	43	0.06	Ref	<0.01
≥11 mm	20 (34)	58		2.4 (1.3–4.5)	

CI: confidence interval; HN: hydronephrosis; HR: hazard ratio.

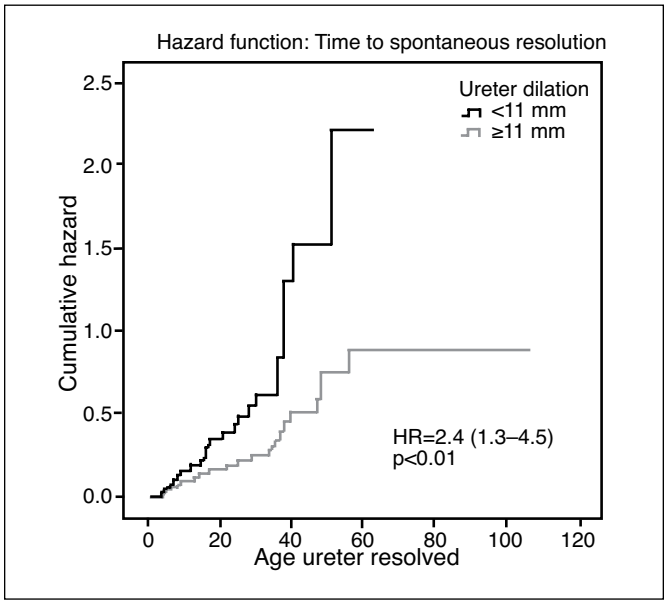

Fig. 1. MP-11.04. Cox proportional regression analysis of ureteral dilation. HR: hazard ratio.

was the only independent risk factor significantly associated with PM resolution (Table 2).

Conclusions: PM children with high-grade HN, ureteral dilation ≥14 mm, and fUTI were at a significantly higher risk of undergoing surgical treatment, and those with ureteral dilation <11 mm were more likely to resolve spontaneously within 24 months.

MP-11.05

Renal cyst evolution in childhood: A contemporary observational study

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Introduction: Children with renal cysts — a common finding — undergo ultrasound (US) monitoring to identify malignant transformation or polycystic kidney disease. The utility of protracted surveillance is questionable. We aimed to determine the proportion of these children who are eventually diagnosed with malignancy, autosomal dominant/recessive polycystic kidney disease (ADPKD/ARPKD); at what time point such diagnoses occur; and predictors of these diagnoses.

Methods: IRB approved retrospective chart review at one institution from 2004–2014. Eligible patients had <3 simple or complex cysts discovered on US without an initial diagnosis of multicystic dysplastic kidney, genitourinary malignancy, ADPKD, or ARPKD. We recorded patient demographics and cyst details at initial identification, followup, if/when a definitive diagnosis was reached, and total length of followup.

Results: Of 87 eligible patients, cysts were initially identified after one year of age in 65 patients (mean 8.0; standard deviation [SD] 4.7). Cysts were mostly unilateral, with 11 cases bilateral. The majority of patients (60/87) had a solitary cyst at first US. Average length of followup was 4.8 years (SD 3.9) with median three followup US (range 0–13). 11 patients (12.6%) were diagnosed with ADPKD and one patient (1.2%) with ARPKD after a median of two followup US (range 1–3) over mean 2.4 years (SD 1.7). A Kaplan-Meier curve of time to diagnosis of ADPKD/ARPKD is shown in Fig. 1. 10 patients (11.5%) had complete resolution. We identified no significant predictors for diagnosis of ADPKD/ARPKD. 12 patients (13.8%) underwent further imaging (six magentic resonace

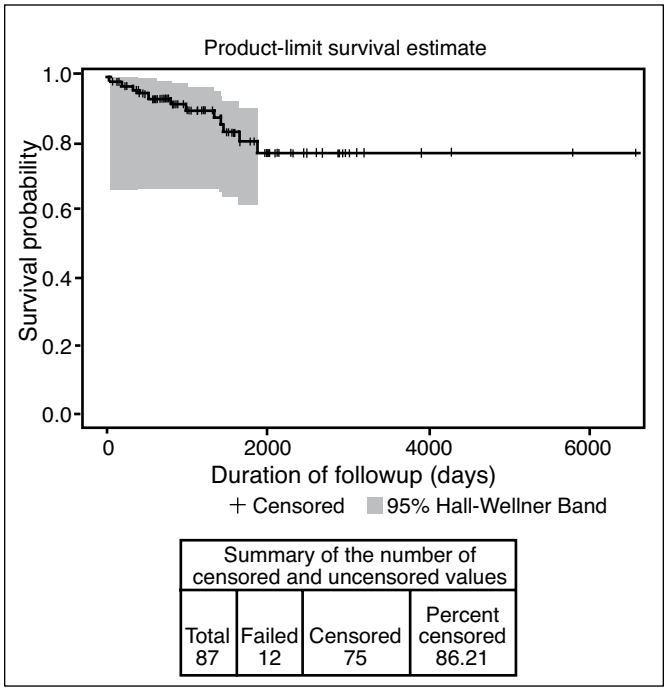

Fig. 1. MP-11.05. Kaplan-Meier curve for time to diagnosis of autosomal dominant/recessive polycystic kidney disease. The marked survival times are censored observations.

imaging, six computed tomography), none underwent renal biopsy; three (3.5%) underwent surgical intervention; none had renal malignancy.
Conclusions: The diagnosis of ADPKD/ARPKD in children followed for simple or complex renal cysts is generally obtained early in followup, with no evidence of malignant transformation. Following patients beyond two followup US or three years may be unnecessary.

MP-11.06

What is the fate of urinary stones in infants younger than one year of age?

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Introduction: Renal stone disease diagnosed in the first year of life is uncommon. We aim to evaluate resolution rates, time to resolution, and need for surgical intervention in children diagnosed in their first year of life.
Methods: We reviewed charts of children younger than 12 months of age diagnosed with renal calcifications between 2000 and 2015. Exact logistic regression was done to assess the relationship between stone size and the need for surgical intervention. Kaplan-Meier curves were constructed to examine time to stone resolution among those not requiring surgical intervention.
Results: 62 patients were included. The majority were male (38/62). The median age at diagnosis was 2.9 months post-natal age. 35 (56%) were diagnosed with stones and 10 (16%) were initially diagnosed with nephrocalcinosis and developed stones during followup; 67% of all stones were asymptomatic on presentation. The remaining 17 (27%) had nephrocalcinosis only. Metabolic anomalies were found in 56% and 10 of these required medical treatment. In the stones population, seven required intervention (two extracorporeal shock wave lithotripsy [ESWL], two ureteroscopy and stent, two percutaneous nephrolithotomy, and one open pyelolithotomy). Stone size was found to predict for surgical intervention (odds ratio [OR] 3.52; 95% confidence interval [CI] 1.47, 12.78) for each 0.1 mm increase). All four patients with a ≥0.6 mm stone size received surgical intervention. Among patients not requiring surgical intervention (n=38), the estimated median time to spontaneous resolution from urolithiasis was 1.08 years (95% CI 0.89–1.53). The median time to resolution from nephrocalcinosis was 1.19 years (95% CI 0.59–2.13).
Conclusions: Spontaneous resolution was a common outcome for newborns and infants diagnosed with urolithiasis in the first year of life, but high variability in time to resolution was observed. Only a small proportion required surgical intervention (15%) and large stone size was revealed to be a predictive factor for the need for such intervention.

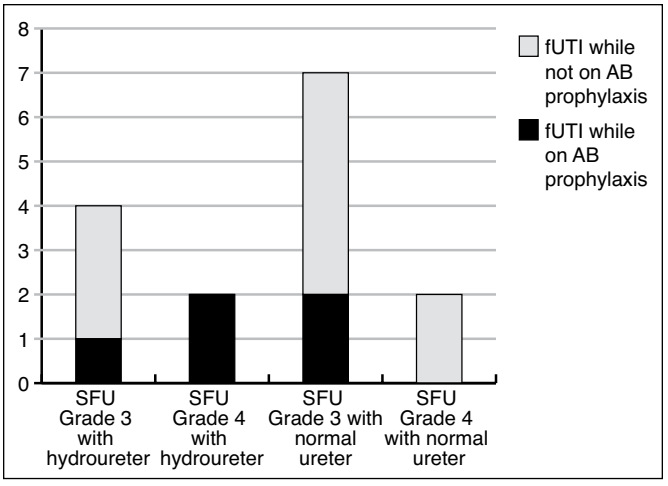

Fig. 1. MP-11.07. The occurrence of febrile urinary tract infection (fUTI) in relation to grade of hydronephrosis abd presence of hydroureter. AB: antibiotics; SFU: Society of Fetal Urology.

MP-11.07

Conservative management of non-refluxing, high-grade hydronephrosis: Rate of hydronephrosis resolution and change to surgery

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Introduction: Non-surgical management of high-grade hydronephrosis (HGH) still carries much debate. Moreover, the impact of hydroureter

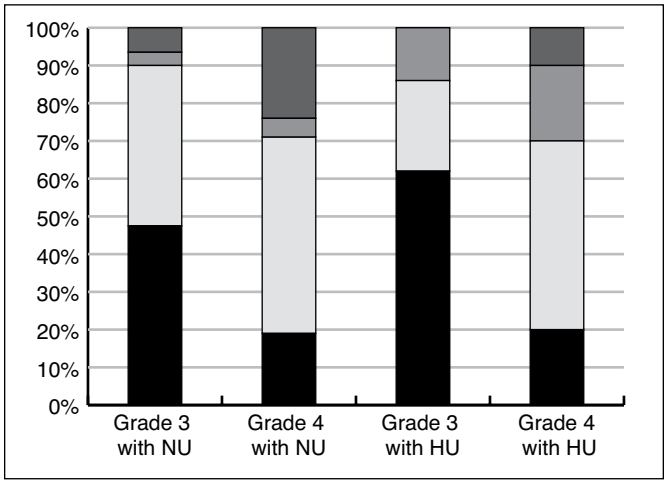

Fig. 2. MP-11.07. Fate of hydronephrosis regarding the presence of hydroureter (HU).

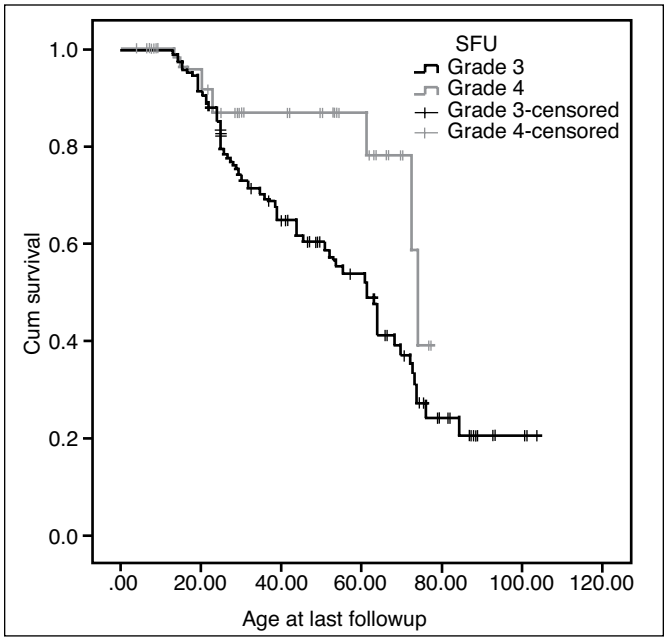

Fig. 3. MP-11.07. Kaplan-Meier survival curve demonstrates the resolution rate of both Society of Fetal Urology (SFU) Grades 3 and 4, regardless the presence of hydroureter (p=0.038).

MP-11.07. Table 1. Patient demographics and followup data

Parameter	Hydronephrosis without hydroureter n (%)	Hydronephrosis with hydroureter n (%)	p
Gender*			
Male	91(82)	20 (69)	0.1
Female	20 (18)	9 (31)	
SFU grade^			
Grade 3	93 (81.6)	21 (67.7)	0.1
Grade 4	21 (18.4)	10 (32.3)	
Laterality*			
Unilateral	55 (49.5)	16 (55.2)	
Bilateral	56 (50.5)	13 (44.8)	0.59
Bilateral HG	3/56	2/13	
Bilateral (HG +LG)	53/56	11/13	
Side^			
Right	23 (20.2)	10 (32.3)	
Left	91 (79.8)	21 (67.7)	0.16
Circumcision*	25 (27.5)	7 (35)	0.48
Prophylactic antibiotics*	22 (19.8)	13 (44.8)	0.005
Febrile UTI*	9 (9.9)	7 (24.1)	0.01
Recurrent fUTI*	2/9 (22.2)	4/7 (57.1)	0.15
Fate of hydronephrosis^			
Resolved	48 (42.1)	15 (48.4)	0.53
Grade 3/4	44/4	13/2	0.56
Improved	51 (44.7)	10 (32.3)	0.21
Grade 3/ 4	40/11	5/5	0.06
Worsening	11 (9.7)	1 (3.2%)	0.25
Grade 3/4	6/5	0/1	0.29
Stable	4 (3.5)	5 (16.1)	0.001
Grade 3/4	3/1	3/2	0.63
Status during followup*			
Discharged	47 (42.3)	15 (51.7)	0.37
Still	53 (47.8)	12 (41.4)	0.54
Changed to surgery	11 (9.9)	2 (6.9)	0.62

*Numbers and percentages were presented in relation to the patients' number; ^numbers and percentages were presented in relation to the renal units' number. fUTI: febrile urinary tract infection; HG: high-grade; LG: low-grade.

(HU) on the complication rate and resolution during followup is not well-presented in the literature. Herein, we evaluated the conservative management of non-refluxing, HGH regarding the fate of hydronephrosis and encountered complications during followup.

Methods: Charts of patients with post-natal hydronephrosis between 2008 and 2014 were retrospectively reviewed. We included only patients who presented in the first year of life with no febrile urinary tract infection (FUTI) at the initial presentation and a minimum of two years' followup if not resolved. All included patients were Society of Fetal Urology (SFU) Grades 3 and 4 that were not refluxing, nor had obstructive renogram. Distal ureters with diameters ≥4 mm were considered HU. We evaluated the fate of hydronephrosis, FUTI, and change to surgery. Fate of hydronephrosis was described as resolved, down-graded, stable, or worsening.

Results: In total, the study included 140 patients with 145 renal units (Table 1). Hydronephrosis without HU was diagnosed in 114 units (111 patients), whereas 31 units had HU (29 patients). Median followup was 38.9 months (12.8–103.7). Three patients with HU (57.1%) had FUTI, while on antibiotic prophylaxis in comparison with two patients without HU (22.2%) (Fig. 1). 11 renal units with normal ureters had surgical intervention at median age 14.5 months due to worsening HGH. Two patients with HU had surgeries due to recurrent FUTI at ages 21 and 51 months. Regarding the age at resolution, there was no difference between those with HU and NU (log rank=0.42 for Grade 3 and 0.82 for Grade 4) (Figs. 2, 3).

Conclusions: More than 40% of non-refluxing HGH was resolved. Presence of HU did not affect the resolution of hydronephrosis or the need for surgical intervention; however, the rate of FUTI was much higher in association with HU, even under the coverage of antibiotics.

MP-11.08

Fate of the failed deflux injection: Lessons learned

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Introduction: When Deflux injections were initiated, a postoperative voiding cystourethrogram (VCUG) study was traditionally performed to confirm complete resolution. If it persisted as same grade or 'downgraded' (a term not used prior to endoscopic management), the injection was determined a failure. We report on the long-term clinical impact and management of the "failed" injection.

Methods: An ethical review board-approved retrospective review was performed of patients who received Deflux from 2003–2006 and identified patients with persistent vesicoureteral reflux (VUR). We determined baseline characteristics, repeat operations, postoperative culture-proven urniary tract infection (UTI), and prevalence of badder bowel dysfunction (BBD).

Results: 170 patients were identified, 125 female and 45 male, and

a total of 263 ureters injected (Gr 1–3, low=201; Gr 4–5, high=62). Mean age at time of procedure was 77.6 months (standard deviation [SD] ± 48.7) and followup duration was 64.8 months (SD ± 42.1). BBD was sought and treated prior to all procedures. Of these, 130/263 (49.4%) injections were confirmed "failed" procedures by post-injection VCUG (persist-low 69.2%, downgraded (low-hi) 19.2%, persist-high 11.5%). 73/130 (rOp; 56%) of the failed injections underwent additional operations, while the remaining 57 were followed conservatively (C; persist-low 10.2%, low-hi 19.3%, persist-high 10.5%). Moreover, only 47.4% of group C vs. 71.2% of group rOp were left on prophylactic antibiotics until BBD was completely treated (p=0.007). Importantly, there was no significant difference in postoperative culture-proven UTIs between groups rOp and C (47.9% vs. 36.8%; p=0.217).
Conclusions: Although our indications in 2003–2006 included first breakthrough UTI or older patients whose VUR did not resolve, this study reveals that treatment of BBD alone in failed procedures without reinjection nor prophylactic antibiotics does not increase subsequent UTI risk. This raises the question of whether a single breakthrough UTI should remain a sufficient indication for primary reflux correction and supports no surgery altogether for asymptomatic patients with persistent VUR.

MP-11.09

The pediatric bladder and bowel dysfunction network: An innovative initiative to improve the management of bladder and bowel dysfunction in children

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Introduction: Most cases of bladder and bowel dysfunction (BBD) improve with bladder retraining and constipation treatment.[1] We are seeing increasing numbers of children with BBD in urology practice resulting in delays in care. We aim to decrease the number of urology visits and wait times by 50% over six months by optimizing the management of BBD by community pediatricians. Our specific objectives are to identify barriers preventing BBD care by pediatricians; assess the impact on care from a pediatric BBD network (BBDN) in which children with BBD who are referred to urology in a single quaternary centre are re-referred to a network of community pediatricians with support of urology division (Fig. 1; available at https://cua.guide/).
Methods: An online survey was distributed and answered by 100 community pediatricians. The Dysfunctional Voiding Score System (DVSS), Bristol stool chart, and anonymous satisfaction survey were completed by families at zero, three, and six months.
Results: Polyethylene glycol 3350 (PEG) is recommended by at least 98.9%; however, voiding diaries, increased fluid intake, and bladder retraining were recommended by only 47.9%, 56%, and 78.6%, respectively. 124 patients were referred to BBDN since April 2016. Initial DVSS (p=0.39), Bristol stool (p=0.69), and overall experience (p=0.94) were similar in the community compared with urology clinic at Sick Kids. Three months repeat DVSS at Sick Kids was significantly lower than initial DVSS (6 ± 3 vs. 11 ± 4.3, respectively; p 0.01). Wait times decreased 40% (median127 to 77 days).
Conclusions: Our preliminary data suggests that constipation is adequately managed by community pediatricians; however, improvement in bladder retraining strategies are needed. Initial DVSS, Bristol stool rates, and overall experience were similar for patients seen by community pediatricians in comparison with children seen in urology clinic at Sick Kids. Next steps include analysis of results at three- and six-month followup visits.
Reference:
1. dos Santos J, Varghese A, Williams K, et al. Recommendations for the management of bladder bowel dysfunction in children. *Pediat Therapeut* 2014;4:191. https://doi.org/10.4172/2161-0665.1000191

MP-11.10

Voiding cystourotherograms for all infants with isolated, high-grade prenatal hydronephrosis: Is it really necessary?

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Introduction: Voiding cystourethrogram (VCUG) is often recommended for infants with Society for Fetal Urology (SFU) grade III/IV prenatal hydronephrosis (HN). A recent survey demonstrated lack of uniformity in this practice, particularly without prior history of urinary tract infections (UTIs). Herein, we evaluate the yield of vesicoureteral reflux (VUR) detection and determine the risk of subsequent UTIs to establish if this diagnostic test impacts practice or is necessary in these circumstances.
Methods: We reviewed our prenatal HN database of patients 0–12 months from 2008–2016 (n=549), including those with SFU III/IV isolated HN (i.e., no ureteric dilatation) and no history of UTI, who underwent VCUG according to our institutional protocol. We excluded children with associated uropathies and those who had VCUG after UTI (n=372). We then divided patients into two groups (those with and without VUR) and compared rates of febrile UTI. We also conducted a subgroup analysis on the rate of VUR in patients with unilateral vs. bilateral HN.
Results: Of 177 patients, median age at presentation was two months (0–12), 139 (79%) were male, 146 (82%) had unilateral HN, and 20 (11%) had VUR. Mean followup was 29 ± 21 months. When comparing patients with and without VUR, we found no difference in gender, laterality of HN, and anteroposterior diameter (APD) (Table 1). Of the patients with

MP-11.10. Table 1. Patient characteristics

	No VUR n=157	VUR n=20	p
Age, months (median)	2 (0–12)	2 (0–12)	0.94
Gender			
Male	123 (78)	16 (80)	1.00
Female	34 (22)	4 (20)	
Circumcised	41 (31)	10 (63)	0.03
Laterality			
Bilateral	28 (18)	3 (15)	1.00
APD baseline, mm	16 + 8	13 + 4	0.11
VUR grades			
1		3	
2		0	
3		6	
4		4	
5		7	
CAP use			
Yes	43 (27)	15 (75)	<0.01
No	41 (26)	3 (15)	
Unknown*	73 (47)	2 (10)	
Reported UTI	13 (8)	2 (10)	0.60
Confirmed UTI	6 (4)	2 (10)	0.22
Surgery	59 (38)	11 (55)	0.15
Maximum followup, months	30 + 21	23 + 18	0.15

*CAP use unknown as children are enrolled in an institutional randomized, controlled trial and are receiving either placebo or CAP. APD: anteroposterior diameter; CAP: continuous antibiotic prophylaxis; UTI: urinary tract infection; VUR: vesicoureteral reflux.

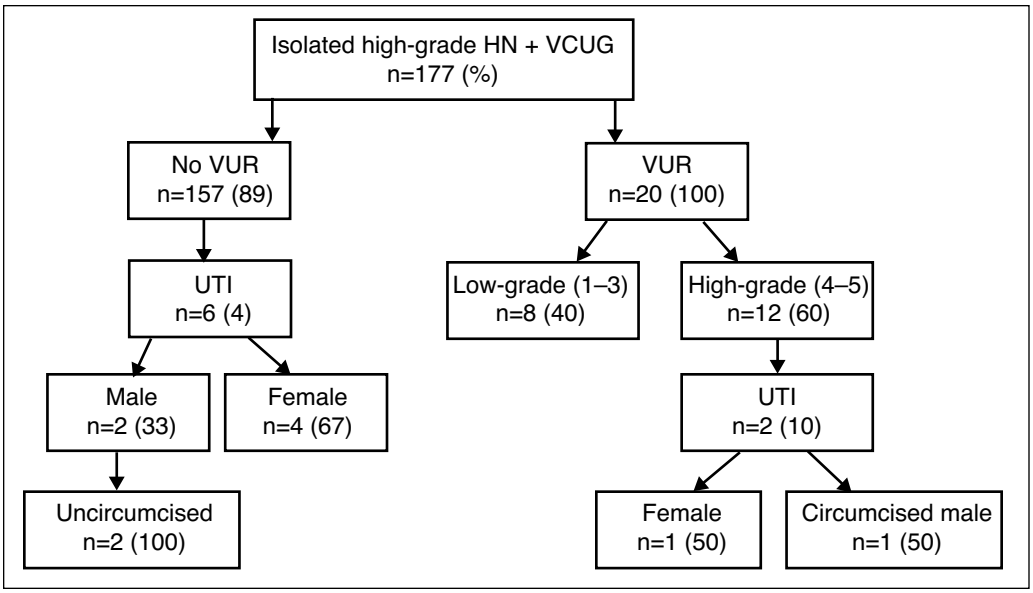

Fig. 1. MP-11.10. Breakdown of study population.

VUR, two (10%) had a confirmed UTI compared to 6/157 (4%) of those without VUR (p=0.22) (Fig. 1). We noted an expected difference in the use of continuous antibiotic prophylaxis (CAP) between the groups, with 16/20 (75%) in the VUR group taking CAP compared to 43/158 (27%) of patients in the no-VUR group (p<0.01).

Conclusions: Identification of VUR during workup of asymptomatic infants with high-grade prenatal HN is uncommon and subsequent development of UTIs even rarer, as suggested by the high number (85) of VCUGs that would have to be performed to identify one child with VUR and potentially prevent one UTI. In addition, having bilateral HN did not increase the likelihood of diagnosing VUR, therefore, ordering VCUG solely based on laterality of HN appears unjustified. In summary, performing a VCUG in the setting of unilateral, high-grade prenatal HN will allow for identification of high-grade VUR in only 5% of children, of whom, only 17% will develop a UTI. Therefore, a more selective approach for ordering VCUG may be indicated and balanced with CAP use and circumcision in these cases.

MP-11.11

Quality of reporting for randomized, controlled trials in the vesicoureteral reflux literature: Where do we stand?

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Introduction: Randomized, controlled trials (RCTs) are the "gold standard" methodology for determining whether treatment effects are due to chance. The fragility index (FI) is used to determine the number of events that would be required to change significant positive results to non-significant (p>0.05). Herein, we assess the quality of reporting of RCTs in vesicoureteral reflux (VUR) literature using the 2010 CONSORT statement, and for studies with significant positive findings, calculate the FI as a measure of robustness of the results.

Methods: A comprehensive search was conducted through MEDLINE® and Embase® to identify RCTs in VUR literature from 2000–2016. Two reviewers independently selected articles and evaluated them using the CONSORT checklist. An overall quality of reporting score (OQR) was calculated by dividing the number of checklist items present in each study by the maximum possible score and expressed as a percentage. Studies were classified as low- (<40%), moderate- (40–70%), and high-quality (>70%). A methodological index score (MIS) out of 4 was assigned based on: sample size justification, allocation concealment, randomization method, and blinding of outcome assessors. Of 2052 initial results, 2003(98%) were excluded because they did not focus on VUR/were not RCTs. After full-text screening of 50 articles, we excluded 28 (56%) that did not meet our criteria. For studies reporting significant positive results, we calculated the FI by manually adding events to the group with fewest events until the p value was no longer significant.

Results: Of the 22 included studies, mean OQR was 45 ± 16% with nine (41%) identified as low-, 11(50%) as moderate-, and two (9%) as high-quality (Table 1). Mean MIS was 1.95 ± 1. There was no difference in OQR between studies published from 2007–2016 (n=15) vs. before 2007 (n=7) (41 ± 15% vs. 44 ± 20%; p=0.70) or RCTs with a sample size >100 (n=15) vs. <100 (n=7) (40 ± 15% vs. 46 ± 17%; p=0.41). However, we noted a difference when we compared RCTs with biostatistician support (n=4) vs. those without (n=18) (62 ± 9% vs. 40 ± 14%; p<0.01).Seven studies reported significant positive results, making calculation of FI possible. Mean FI was 5.8 ± 5.1, indicating that most studies were fragile. There was no correlation between the OQS and FI.

Conclusions: The current OQR in VUR literature is suboptimal. In addition, most FI scores were between 1 and 5, indicating that only a few events would be required to completely change the results of these studies. Implementation of the CONSORT checklist as a prerequisite for submission of manuscripts may improve the quality of reporting, and calculation of the FI could provide readers with an objective measure of robustness for the reported results.

MP-11.12

Tertiary centre variability among pediatric surgeons and pediatric urologists in the management of cryptorchidism in the era of guidelines

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Introduction: Orchidopexy (O) is one of the most common congenital abnormalities managed by both pediatric urologists (U) and pediatric surgeons (S). We sought to analyze the approaches to cryptorchidism (UDT) in a single-payer, large tertiary children's hospital by U and S and correlate them to published guidelines.[1]

Methods: A retrospective chart review was conducted of all children undergoing O performed at our centre by either a U or S over a two-year

MP-11.11. Table 1. Summary of RCTs in VUR-based literature

Authors	Title	Group A	Group B	p	Consort score	Fragility index
Roussey-Kesler et al		CAP 18/103	Obs 32/122	0.15	54.3	0
Hari et al		CAP 10/47	Placebo 3/46	0.07	74.3	0
Hoberman et al		CAP 39/302	Placebo 72/305	0.0007	62.9	13
Capozza et al		Deflux 27/40	CAP 8/21	0.29	45.7	0
Pennesi et al		Abx 18/50	Obs 15/50	0.67	68.6	0
Schwentner et al		Intravesicle 22/22	Extravesicle 22/22		31.4	0
Smellie et al		Medical 11/28	Sx 6/25	0.25	60	0
Olbing et al		Surgical 57/110	Medical 56/113	0.78	8.6	0
Lee et al	Probiotics for persistent VUR	Probiotics 11/60	Abx 13/60	0.926	42.9	0
Lee et al	Probiotics for infants	Probiotic 21/64	CAP 26/64	0.463	37.1	0
Moore et al	Macroplastique vs. deflux	Poly 182/202	Deflux 159/197	<0.05	40	5
Garcia-Aparicio et al		Endo 32/35	Sx 32/32	0.24	42.9	0
Olbing et al	Renal growth continuous data					N/A
Mattoo et al		CAP 19/298	Placebo 21/301	0.77	42.9	0
Jodal et al	Primary scarring	Surgical 63/127	Medical 61/125	0.90	37.1	0
Holmdahl et al	resolution	CAP 9/69	Deflux 20/66		0.02	1
Brandström et al	Renal damage	Obs 12/68	CAP 4/68	0.11	34.3	0
Brandström et al	UTI pattern					
Sillén et al	BBD UTIs					
Kojima et al	Ureteral advancement	Non 22/26	Advancement 25/25	0.04	28.6	0
Kajbafzadeh et al	Alpha blocker therapy	Placebo 4/22	Alpha blocker 24/40	0.002	40	3
Craig et al						5

BBD: bladder and bowel dysfunction; RCT: randomized, controlled trial; UTI: urinary tract infection; VUR: vesicoureteral reflux.

period (2012–2014). Parameters evaluated included: patient age, surgical service (U or S), presence of preoperative ultrasound, laterality, surgical approach, operative time, and complications. Guidelines published by the American Urological Association (AUA) (2014), the British Association of Pediatric Surgeons (BAPS) (2015), and the European Society for Pediatric Urology (ESPU) (2015) were correlated with results.

Results: Of the 248 O, U performed 203 (82%), compared to S, who performed 45 (18%). Referral to U and S were at mean age of four and S 3.3 years, and age at surgery was 4.5 and 3.8 years, respectively (NS). A substantial number of patients were referred with a preoperative ultrasound, the majority of which were ordered by a primary care physician, but S ordered preoperative ultrasound in 27% compared to <7% by U. Approximately one-quarter (23%) of patients had bilateral cryptorchidism (BC). There was a preference by S to perform BC in two separate settings compared to U. None of the patients treated by S were approached scrotally, compared to 46% by U.

Conclusions: Guidelines do not always predict actual practice, even in an academic referral centre where fiscal competition is absent. U tended to adhere to guidelines more closely, but mean age of referral to any subspecialist and actual age of surgery was higher than guidelines recommend.[1] Laparoscopic and scrotal approaches statistically were employed much more often by U, and preoperative ultrasound for UDT was com-

monly ordered by S. A national survey of Canadian U and S through Pediatric Urologists of Canada (PUC) and CAPS is planned to assess these questions nationally.

Reference:
1. Kolon TF, Herndon CD, Baker LA, et al. Evaluation and treatment of cryptorchidism: AUA guideline. *J Urol* 2014;192:337-45. https://doi.org/10.1016/j.juro.2014.05.005

MP-11.13

Does the presentation timing affect the need for further surgical interventions after transurethral incision of ureterocele?

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Introduction: We evaluated the feasibility of transurethral incision of ureteroceles (TUI) as a definitive line of management. Moreover, we studied the impact of presentation on the outcomes.

Methods: We retrospectively reviewed patients' charts who had ureteroceles from 1995–2015. We included patients who had undergone initial TUI. The initial presentation and timing was recorded. We reviewed all ultrasounds, voiding cystourethrograms (VCUG) and dimercaptosuccinic acid scans (DMSA) pre- and post-TUI (Table 1). Moreover, the occurrence of febrile urinary tract infections (FUTI) and any secondary surgical intervention were recorded.

Results: We included 51 patients with 53 ureteroceles. 50% of patients presented antenatally, while others had FUTI at time of presentation. 39 ureteroceles were associated with duplex systems (DSU), while the remaining ones had single collecting systems (SSU) (Table 2). The median followup was 44 months. The incidence of de novo reflux into ureterocele was 44% of SSU and 23% of DSU (p=0.22). Reflux into ureterocele after TUI (four SSUs and seven DSUs) carried a high risk of surgical interventions (3/4 SSUs and 6/7 DSUs). Hydronephrosis was improved in 64% of both DSU and SSU patients. 51%of DSUs had secondary interventions, while the latter was indicated in 35.7% of SSUs. 12 patients (70%) presented postnatally with DSUs had subsequent interventions after incision in comparison to 40% (eight patients) of those presented antenatally. DSUs had improved renal function (by DMSA) in 26%, while the remaining had stable renal function.

Conclusions: Two-thirds of SSUs and approximately half of DSUs had no surgical intervention after TUI. However, those presented antenatally had lower risk of FUTI and a lesser probability to be reoperated. VUR into ureterocele, regardless of the system duplicity, had high reoperation rate. 26% of DSUs had renal function improvement after ureterocele incision.

MP-11.13. Table 1. Postoperative outcomes regarding to renal system duplicity

Parameter	TUI		p
	SSU	DSU	
Median age at primary surgery	12.8 months	4.3 months	0.28
Median postoperative follow up	43.8 months	44.6 months	0.55
No. need for second surgery (%)	5/14 (35.7)	20/39 (51.3)	0.21
No. febrile UTI after puncture (%)	3/12 (25)	16/39 (41)	0.24
No. post-TUI VUR (%)	4/9 (44.4)	19/30 (63.3)	0.31
No. de novo VUR (%)	4/9 (44.4)	7/30 (23.3)	0.22
Hydronephrosis improvement (%)	9/14 (64.3)	25/39 (64.1)	0.51
No. renal function improvement (%)	0/5 (0)	4/15(26.6)	0.2

DSU: duplex system ureteroceles; SSU: single collecting system ureteroceles; TUI: transurethral incision of ureteroceles; UTI: urinary tract infection; VUR: vesicoureteral reflux.

MP-11.14

Comparing digital photography via email correspondence (PEC) to traditional telephone communication (TTC) for pediatric urology postoperative patients: A pilot, randomized, controlled trial

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Introduction: Postoperative concerns are commonly managed by a nurse practitioner (NP) via traditional telephone conversation (TTC). Electronic interaction, including digital photographs sent via email (PEC), has become an alternative, novel strategy to evaluate surgical site concerns. Herein, we present a pilot a study to determine the feasibility of conducting a definitive trial comparing the effectiveness of PEC vs. TTC in reducing the number of unplanned clinic and emergency room (ER) visits, as well as improving patient/parent experience.

Methods: Children <18 years at the time of surgery and within the 30-day postoperative period were recruited from June 2015–January 2016 at a tertiary children's hospital. Patients were allocated to PEC or TTC after

MP-11.13. Table 2. The impact of presentation on TUI outcome

	SSUs			DSUs		
	Antenatal	Postnatal	p	Antenatal	Postnatal	p
No. units	**7 (5 patients)**	**7 (7 patients)**		**20 (20 patients)**	**17 (17 patients)**	
Age at presentation	0.16 (0.07–0.6)	24.8 (3.3–115.2)	0.001	0.5 (0.1–4.87)	11.2 (0.67–194.8)	<0.05
Age at TUI	0.67 (0.2–12.8)	26.4 (6.8–121.4)	0.007	2.9 (0.4–6.4)	12.6 (0.7–201)	<0.05
No. need for second surgery	2 (28.6%)	3 (42.8%)	0.57	8 (40%)	12 (70.6%)	0.06
Age at second surgery (months)	21.8(8.1–35.7)	74.8(26.1–96)	0.4	27.4 (16.3–79.3)	28.7(19.6–69.63)	0.8
No. de novo VUR	1 (14.3%)	3 (42.8%)	0.24	3 (15%)	4 (23.5%)	0.5
No. post-TUI fUTI	1 (20%)	2 (28.6%)	0.73	7 (35%)	9 (52.9)	0.27
No. renal function improvement	0/3 (0%)	0/2 (0%)	---	2/7 (28.6%)	2/8 (25%)	0.88

DSU: duplex system ureteroceles; fUTI: febrile urinary tract infection; SSU: single collecting system ureteroceles; TUI: transurethral incision of ureteroceles; VUR: vesicoureteral reflux.

initiating contact with the NP through an electronic, centralized, blocked randomization system. A standardized phone script was used to gather relevant clinical data for both groups, with those randomized to PEC sending digital photos of the surgical site. Within 48 hours, families were sent a link to a survey measuring patient experience using a validated questionnaire. Feasibility data on recruitment rates, compliance with sending photos, and completing questionnaires were collected. Secondary outcomes included: number of unplanned clinic/ER visits, number of followup phone calls, and patient experience scores.

Results: 215 (66%) of the 328 children who underwent surgery during the eight-month recruitment period consented to participate. Of these, 42 (13%) contacted the NP with postoperative concerns and were randomized. Two patients in the PEC group were excluded after randomization (one for contacting on postoperative day 31, and one for not sending photos), resulting in 19 patients in the PEC group and 21 in the TTC group. Penile surgeries (hypospadias + circumcisions) (17 + 40; 43%) were the most common procedures with postoperative concerns. 20 of 21 (95%) PEC patients were compliant in sending photos. Overall, 41/42 (95%) surveys were completed. Twice as many unplanned clinic visits were observed in the TTC group when compared to PEC (p=0.28) despite of similar number of followup phone calls between groups (Table 1). Patient experience scores were also comparable in both groups, with families scoring high satisfaction regardless of the modality of communication.

Conclusions: A definitive trial examining the effectiveness of PEC vs. TTC appears feasible and safe as seen by the high recruitment, photographic compliance, hospital visits, and survey completion rates in this pilot study.

MP-11.14. Table 1. Comparing PEC to TTC for pediatric urology postoperative patients

	PEC n=19 (%)	TTC n=21 (%)	p
Mean age, months	29 + 30	42 + 50	0.31
Mean postoperative day of call	4 + 4	8 + 8	0.07
Clinic visits	3 (16)	7 (33)	0.28
Emergency room visits	2 (11)	0 (0)	0.20
Additional phone calls	6 (32)	7 (33)	1.00

PEC: photography via email correspondence; TTC: traditional telephone conversation.

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