Podium Session 1: Prostate Cancer
June 24, 2018; 1030–1130

POD–1.1

PROSPER: A phase 3, randomized, double–blind, placebo–controlled study of enzalutamide in men with non–metastatic castration–resistant prostate cancer

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Study Groups: This study was funded by Astellas Pharma Inc. and Pfizer Inc., the co–developers of enzalutamide. Editorial assistance provided by Caitlin Watson of Complete HealthVizion, funded by study sponsors.

Introduction: Men with non–metastatic castration–resistant prostate cancer (M0 CRPC) and rapidly rising prostate–specific antigen (PSA) are at high risk of developing metastatic (M1) CRPC. Enzalutamide (ENZA) improves overall survival (OS) and radiographic progression–free survival in men with M1 CRPC. We hypothesized that ENZA will improve metastasis–free survival (MFS) in men with M0 CRPC.

Methods: Eligible men with M0 CRPC, PSA doubling time ≤10 months and PSA ≥2 ng/mL at screening continued androgen–deprivation therapy (ADT) and were randomized 2:1 to ENZA 160 mg or placebo. The primary endpoint was MFS. Secondary endpoints included time to PSA progression, time to first use of new antineoplastic therapy, OS, and safety.

Results: In 1401 men, ENZA significantly prolonged median MFS (36.6 vs. 14.7 months; p<0.0001), median time to first use of new antineoplastic therapy (39.6 vs. 17.7 months p<0.0001), and median time to PSA progression (37.2 vs. 3.9 months; p<0.0001]) compared to placebo (Table 1; available at *https://cua.guide/*). In the first interim analysis of OS, there was a trend in favour of ENZA (hazard ratio [HR] 0.80; p=0.1519). Median duration of treatment was 18.4 vs. 11.1 months for ENZA vs. placebo. Adverse events (AEs) were higher with ENZA vs. placebo (any grade: 87% vs. 77%; grade ≥3: 31% vs. 23%; serious: 24% vs. 18%); 10% of patients discontinued treatment due to AE with with ENZA vs. 8% with placebo.

Conclusions: In men with M0 CRPC and rapidly rising PSA, ENZA treatment resulted in a clinically meaningful and statistically significant 71% reduction in the risk of developing M1 CRPC. AEs were consistent with the established safety profile of ENZA.

POD–1.2

Serum sex steroids as prognostic biomarkers in patients receiving androgen–deprivation therapy for recurrent prostate cancer post–radiotherapy: A post–hoc analysis of the PR.7 trial

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Study Groups: Study funded by a Prostate Cancer Canada Movember Discovery Grant.

Introduction: Nadir testosterone values following initiation of androgen–deprivation therapy (ADT) have been shown in several studies to be prognostic for outcome, including time to castration–resistant prostate cancer (TTCRPC) and cancer–specific survival (CSS).[1] The biological reasons for this remain unclear. Using cryopreserved serum from the PR.7 trial of intermittent vs. continuous ADT, we sought to assess the role of related sex steroids as prognostic biomarkers in men on ADT for recurrent cancer post–radiotherapy.

Methods: Canadian patients in the PR.7 trial randomized to the continuous arm were included. Patients were excluded if they did not receive ADT (n=3), had <2 years of followup (n=2), received exogenous estrogens or glucocorticoids (n=5), or samples were unavailable (n=36). Liquid chromatography–tandem mass spectrometry (LC–MS/MS) was performed using a validated method to simultaneously analyze 10 steroids: dehydroepiandrosterone (DHEA), testosterone (T), dihydrotestosterone (DHT), androst–5–ene–β,17β–diol (5–diol), androstenedione (4–dione), androsterone (AD), estrone (E_1), estradiol (E_2), progesterone, and androstane–3β; 17β–diol (3βdiol). Descriptive statistics and correlation analyses were performed, with longitudinal changes categorized as stable, increasing, decreasing, or mixed. The prognostic value of individual steroid tertiles, as well as E_1:E_2, E_2:T and DHT:T ratios were assessed by Kaplan–Meier analysis and Cox proportional hazards adjusted for baseline clinical variables. Outcomes assessed were TTCRPC, CSS, and overall survival (OS).

Results: A total of 219 patients were included in the analysis who had a cryopreserved serum available within two years of randomization, with 104 patients having two subsequent annual samples available for measurement. Values for DHT, T, 4–dione, AD, DHEA, and 5–diol tended to be correlated among samples. Lower DHEA and AD values were significant associated with older age, as was lower DHEA and DHT values with poorer performance status. Higher tertiles of E_1 and E_2 were associated with sooner TTCRP (log–rank, p=0.03, p=0.02, respectively). Similar trends were seen for 4–dione in predicting TTCRPC (log–rank, p=0.07). Upon adjustment, the highest tertile of E_2:T had increased hazard ratios (HR) for CSS (HR 2.36; 95% confidence interval [CI] 0.90–6.21; p=0.08) and TTCRPC (HR 1.70; 95% CI 0.90–3.23; p=0.10) relative to the lowest tertile. In an analysis of the subset of patients with longitudinal values, increasing levels of AD over time were associated with poorer CSS and OS (log–rank p=0.04 and p<0.01, respectively). On adjusted analysis, increasing AD levels had a HR for CSS of 3.43 (95% CI 0.63–18.67; p=0.15) and a HR for OS of 4.75 (95% CI 1.49–15.17; p<0.01). Limitations include the number of events for some groups.

Conclusions: Increased levels of E_1, E_2, and AD during ADT correlated with adverse TTCRPC and CSS. Serum sex steroids, including both androgens and estrogens, may act as prognostic biomarkers in men receiving ADT for recurrent prostate cancer. Further investigation is warranted to support clinical use.

Reference:

1. Klotz L, Breau RH, Collins LL, et al. Maximal testosterone suppression in the management of recurrent and metastatic prostate cancer. *Can Urol Assoc J* 2017;11:16–23. https://doi.org/10.5489/cuaj.4303

POD–1.3

Metastatic castrate–resistant prostate cancer treatment algorithm: A shifting paradigm

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Introduction: With a growing number of treatment options available for metastatic prostate cancer, physicians are now able to sequence multiple lines of therapies over the course of their patient's disease. The Genitourinary Research Consortium (GURC) identified a need to incorporate emerging trial evidence to develop a treatment algorithm to support physicians who treat advanced prostate cancer .

Methods: A national working group of uro–oncologists, medical oncologists, and radiation oncologists examined clinical trial evidence and subsequently engaged in consensus discussions to develop a practice algorithm for the treatment and management of patients with metastatic castrate–resistant prostate cancer.

Results: Drawing upon the evidence from the COU–301, COU–302, PREVAIL, AFFIRM, TAX 327, TROPIC, and ALSYMPCA trials, the algorithm (Fig. 1; available at https://cua.guide/) streams patients into a treatment pathway with accompanying sequencing of lines of therapy. All patients should be offered clinical trials, if available. Lines of therapy include various sequences of androgen receptor (AR)–targeted agents, chemotherapy, and radium–223, and consider patient risk status, medical comorbidities, and toxicity profiles of therapy.

Conclusions: The emergence of new therapies in metastatic prostate cancer provide physicians with sequencing possibilities and opportunities for individualizing therapy. The GURC practice algorithm is a tool to support the management of advanced metastatic prostate cancer. Further research may involve assessment of outcomes and economic analyses to determine the value of these algorithms in the community and academic settings. Since the algorithm was nationally developed and designed to reflect evidence–based and expert–consensus practice recommendations, it is possible some provinces will have funding policies that are incongruent with the algorithm. In such cases, the variation of treatment access across provinces can be further examined.

POD–1.4

Prostate cancer incidence and mortality in Saskatchewan men on 5α–reductase inhibitors and α–blockers for benign prostatic hyperplasia (1995–2014)

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Study Groups: Funded by NIH National Institute on Aging Award Number R01AG038453.

Introduction: Our objective was to investigate prostate cancer (PCa) incidence, severity (grade and metastases), and mortality among men using 5α–reductase inhibitors (5ARIs) with or without α–blockers (α–blockers) for benign prostatic hyperplasia (BPH) .

Methods: We conducted a retrospective 20–year cohort study in 249 986 Saskatchewan male patients aged 40–89 years diagnosed with BPH between 1995 and 2014. Cox proportional hazards regression was used to compare incidence of a PCa diagnosis, metastatic PCa, Gleason score 8–10 PCa, and PCa mortality among 5ARI users (n=4571), α–blocker users (n=7764), and non–users (n=11 677).

Results: In comparison with both non–users and α–blocker users, 5ARI users had >35% lower risk of a PCa diagnosis; α–blocker users had 11% lower risk of a PCa diagnosis compared with non–users. Overall, there was no significant increase in metastatic PCa and PCa mortality among 5ARI and α blocker users (p>0.05 for both drugs), but approximately a 30% higher risk of Gleason score 8–10 cancer (adjusted hazard ratio [aHR] 1.37; 95% confidence interval [CI] 1.03–1.82; p=0.03 and aHR 1.28; 95% CI 1.03–1.59; p=0.02, respectively) compared with non–users.

Conclusions: 5ARI use was associated with lower risk of a PCa diagnosis. Risk of high–grade PCa was higher among both 5ARI users and α-blocker users compared with non–users; however, this did not translate into higher risk of PCa mortality. These results provide reassurance for BPH patients on 5ARI therapy.

POD–1.5

Salvage cryoablation for recurrent prostate cancer following radiation therapy: Long–term outcomes from a combined analysis of two centres

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Introduction: There is a paucity of long–term data on the outcomes of salvage cryotherapy for locally recurrent prostate cancer following radiation therapy (RT). We aimed to investigate long–term outcomes by performing an analysis of case series from two centres.

Methods: Patients undergoing salvage cryotherapy for biopsy–proven, localized radiorecurrent prostate cancer (RRPCa) from 1990–2004 were prospectively accrued. Preoperative characteristics, perioperative morbidity, and postoperative data were reviewed from a prospectively maintained database. The primary outcomes were overall survival (OS) and disease–specific survival (DSS). Secondary outcomes were metastasis–free survival (MFS), freedom from castrate–resistant prostate cancer (CRPC), and freedom from androgen–deprivation therapy (ADT).

Results: A total of 268 patients were identified, with a median followup of 10.3 years. One hundred ninety–nine (74.3%) experienced complications, including 381 Clavien I–II events and 55 Clavien III events. At 10 years, 69% had freedom from ADT, 76% had freedom from CRPC, and the MFS rate was 76%. The 10–year DSS rate was 81%, and the 10–year OS rate was 77%. Pre–salvage prostate–specific antigen level of >5 ng/mL was associated with an increased risk of developing CRPC, but was not associated with MFS, DSS, or OS (Figs. 1, 2). The use of neoadjuvant ADT was associated with decreased MFS and improved OS and DSS, but did not affect freedom from CRPC (p<0.05).

Conclusions: Salvage cryotherapy for RRPCa provides long–term freedom from ADT and CRPC and MFS, DSS and OS with acceptable morbidity. Salvage cryotherapy is, therefore, a viable treatment option for localized RRPCa. Prospective trials are required for validation.

POD–1.6

A prospective multicentre study comparing multi–parametric MRI (mp–MRI), F–18–choline (FCH) and Ga–68–PSMA PET/CT in patients being considered for salvage radiation therapy after radical prostatectomy

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Introduction: A significant proportion of men will not benefit from salvage radiotherapy (SRT) after radical prostatectomy (RP). This study aims to evaluate the predictive value of new imaging methods, such as fluoromethylcholine (FCH) and prostate–specific membrane antigen ligand–positron–emission tomography/computed tomography (PSMA–PET/CT), or multiparametric magnetic resonance imaging (mpMRI) in triaging men unlikely to benefit from SRT.

Methods: This study is a prospective trial in men post–RP with poor response features (prostate–specific antigen [PSA] >0.2 ng/ml and >Gleason 7 or PSA doubling time (DT) <10 months, or PSA >1.0 ng/ml) with a rising PSA and being considered for SRT after negative conventional imaging. Ninety eligible men underwent FCH PET/CT, mp–MRI within two weeks, with a subset of men (30) undergoing an additional PSMA PET/CT. Imaging was double–read with consensus. There was documentation of the treatment plan before and after imaging to assess management impact. Imaging results were validated using a composite reference standard of biopsy, repeat imaging, PSA response to targeted treatment, and complete multimodality agreement. SRT response was defined as a PSA drop of >50% without androgen–deprivaton therapy (ADT).

Results: Median PSA at imaging was 0.4±1.2, median Gleason score was 8, and median PSA doubling time was five months. Detection rates for any recurrent prosate cancer were 27% (24/89), 32% (29/90), and 43% (13/30) for mpMRI, FCH, and PSMA, respectively. In these, extra-prostatic bed disease was identified in 41% (11/24) (mpMRI), 58% (17/29) (FCH), and 69% (9/13) (PSMA); prostatic bed disease was found in 15% (mpMRI), 13% (FCH), and 13% (PSMA). Imaging findings changed management in 46% for FCH and 24% for MRI. An incremental management impact of PSMA over FCH was identified in 27% (8/30). Among men with negative or fossa–confined PSMA or FCH, treatment response to prostate bed SRT was 78% (7/9) and 72% (33/46), respectively.

Conclusions: PSMA or choline PET/CT detected most extraprostatic disease in men with rising PSA post–RP being considered for SRT with poor response features. The findings had a significant impact on patient management and treatment outcomes.

Podium Session 2: Pediatrics/Endourology
June 25, 2018; 1250–1350

POD–2.1
The FOXY study: A randomized trial comparing the efficacy and safety of fesoterodine and oxybutynin XL in children with overactive bladder

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Introduction: Oxybutynin has long been the only drug approved for the treatment of overactive bladder (OAB) in children. Some children have a suboptimal response or suffer from side effects, dictating the necessity for other drugs to gain approbation. Our objectives were to assess and compare the efficacy and safety of fesoterodine and oxybutynin XL in the treatment of children with OAB.

Methods: We performed a randomized, double–blind trial with a crossover design in 64 children with OAB aged 5–14 years. Every child received a daily dose of one of the two study drugs (feso 4 mg or oxy XL 10 mg) for an eight–week period. After a washout of three days, they did a second eight–week period with the other agent. Followup visits were scheduled (Weeks 0, 2, 10, 19). A three–day voiding diary was filled out before each visit. The efficacy and safety of the drugs were assessed through changes on the voiding diaries, the Patient Perception of Bladder Condition (PPBC) score, side effects, vital signs, urinalysis, post–void residual, electrocardiography (ECG), and blood tests. At the end of the study, children were asked to choose witch drug they preferred. If they chose fesoterodine (n=24), they were offered a one–year extension. At each visit, the safety and efficacy were evaluated, as previously described.

Results: Patients were either in Group 1 or 2 (feso–oxy or oxy–feso). Both groups were similar. All had improvement of the parameters evaluated at four months. We could not demonstrate a significant difference between the two drugs. The differences between the PPBC score of the two drugs was of 0.27, mean voided volume was of 8.6 ml, and no difference in daily frequency was noted. All noted side effects were mild and there were no major adverse events. There seemed to be a few more adverse events with oxybutynin, with an odds ratio of 0.53 (95% confidence interval 0.26–1.1; p=0.09).

Conclusions: Fesoterodine or oxybutynin XL appeared to be effective and safe treatment options for OAB in children. According to our current data, the efficacy and safety of both molecules seems similar.

POD–2.2
Parental perceptions and attitudes towards disclosure of hypospadias repair

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Introduction: Boys with hypospadias often undergo reconstructive surgery to improve cosmetic appearance and functional outcomes. While the ethics of physician–patient disclosure of illness are clear, parent–child disclosure is more ambiguous. There is a paucity of research regarding the parental disclosure of past urological procedures, specifically hypospadias repair. Our objective was to determine the rate of parental disclosure in boys undergoing hypospadias repair and to evaluate the parental perspectives regarding concerns and amount of support in relation.

Methods: A web–based questionnaire was distributed to parents of hypospadias patients at McMaster Children's Hospital pediatric urology outpatient clinic and to those belonging to various invite–only social media support groups. Data was analyzed using descriptive statistics and Chi–squares.

Results: One hundred and forty–two survey responses were collected. The majority of respondents were North American (82.5%), urban dwellers (70.0%), and the mothers of the child (81%). Distal hypospadias was the most common variant of the condition (68%). When asked if they plan to disclose the repair to their child, 94% said "yes," and of those, the optimal mean age of disclosure was 7.44±4.56 years. Ninety–two percent reported that they were not offered guidance on how/when to disclose; 49% thought they would benefit from support on this. There was a significant difference in nervousness to disclose if the condition was distal vs. proximal (p=0.008), with proximal being more nervous.

Conclusions: To our knowledge, this is the first study to evaluate perceptions and attitudes around disclosure in patients with hypospadias and their families. The majority of respondents were planning to disclose the operation to their child and were not offered any guidance or support as to the optimal way to disclose. Half of those parents thought they could benefit from resources to help them with this process. Further research is required to understand the impact of disclosure and to create tools to help caregivers with this responsibility.

POD–2.3
Does breastfeeding reduce the risk of urinary tract infection in infants with prenatal hydronephrosis?

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Introduction: The role of breastfeeding (BF) in preventing urinary tract infections (UTIs) in infants with prenatal hydronephrosis (PHN) has, to our knowledge, not been investigated.

Methods: From 2009–2017, we prospectively screened 1198 patients with HN. Patients ≤12 months old at presentation and diagnosed with grades I–IV Society of Fetal Urology (SFU) HN were included (770). Medical records lacking BF information (390), anomalies (78), and those >12 months(289) at baseline were excluded, resulting in 302 included infants. Baseline patient demographics, BF history (age BF stopped, % BF), febrile (f)UTI rates, SFU grades, continuous antibiotic prophylaxis (CAP) status, and gender and circumcision status were captured. The primary outcome was UTI rate. Univariate and multivariate analyses of predetermined UTI risk factors were done.

Results: Of 302 infants, 241 (80%) were male, 153 (63%) were uncircumcised, and 139 (46%) had high–grade (III–IV) SFU HN. Overall, 34 (11%) developed UTI. Thirty–five (11%) babies received formula only, 135 (45%) had breast milk and formula, and 132 (44%) were breastfed exclusively. Of BF patients, 198(74%) were breastfed for ≥6 months. BF had no effect on the rate of fUTI in this population, regardless of the intensity or duration. Not being prescribed CAP (16% vs.7%; p=0.03) and having either primary non–refluxing megaureter or vesicoureteral reflux (VUR) as opposed to ureteropelvic junction obstruction (UPJO)–like (28%, 17% vs. 6%; p≤0.01) were found to be associated with risk of developing a UTI (Table 1; available at https://cua.guide/). On multivariate analysis, all three were again the driving factors for UTI (Table 2; available at https://cua.guide/).

Conclusions: Although there has been indication in the literature that BF may provide some protection for infants against developing infections, in

our cohort of infants with HN, no protective effect was seen for fUTI. CAP and etiology of the HN were the driving factors.

POD–2.4

Effect of a bacterial urinary infection isolate on a calcium urolithiasis model

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Introduction: Urinary bacteria may contribute to the development of calcium stone disease. Previous epidemiological studies have demonstrated a correlation between culture proven urinary tract infections and stone disease.[1] It has also been reported in preliminary studies that bacteria have been directly isolated from non–struvite stones.[2,3] We aimed to examine the effect of non–urease producing bacteria isolated from a urinary tract infection on the formation of calcium oxalate stones in a Drosophila melanogaster fly model.

Methods: A non–urease producing strain of Escherichia coli (UTI89) was administered to flies overnight in a 5% sucrose solution. The flies were then fed 1% sodium oxalate food for the remainder of the seven–day assay. Flies were pulverized and cultured on lysogeny broth agar plates on Days 1–5 to determine if UTI89 persisted in the flies. Stone burden was assessed with a fecal crystal assay and survival curve analysis.

Results: UTI89 was cultured from the exposed flies for up to three days post–exposure with at least $3x10^3$ colony forming units/fly. Dosing with UTI89 did not affect the survival of healthy flies fed normal food. There was a trend towards decreased survival in flies exposed to the combination of UTI89 and oxalate food. In addition, preliminary results suggest that exposure to UTI89 altered fecal oxalate crystal production.

Conclusions: These findings suggest that the presence of a non–urease producing E. coli impacts calcium oxalate stone formation in a urolithiasis model, which could have implications in human stone disease. Further confirmation of these results is required, as well as investigation to delineate the potential mechanisms by which this may occur.

References:

1. Holmgren K, Dalielson BG, Felsltrom B, et al. The relation between urinary tract infections and stone composition in renal stone formers. *Scand J Urol Nephrol* 1989;23:131–6. https://doi.org/10.3109/00365598909180827
2. Tavichakorntrakool R, Prasongwattana V, Sungkeeree S, et al. Extensive characterizations of bacteria isolated from catheterized urine and stone matrices in patients with nephrolithiasis. *Nephrol Dial Transplant* 2012;27:4125–30. https://doi.org/10.1093/ndt/gfs057
3. Barr–Beare E, Saxena V, Hilt E, et al. The interaction between enterobacteriaceae and calcium oxalate deposits. *PLoS One* 2015;10:e0139575. https://doi.org/10.1371/journal.pone.0139575

POD–2.5

Identifying the risk factors for the development of nephrolithiasis in end–stage renal disease dialysis patients

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Introduction: There is a common assumption that patients with end–stage renal disease (ESRD) do not form renal stones due to their oliguric or anuric state. The incidence and risk factors for stone development in this population remain unknown.[1] It is thought that stone formation in ESRD hemodialysis (HD) patients develops via different mechanisms, therefore, different risk factors may be involved in stone formation in this particular population.[2] The aim of the present study is to assess the incidence and risk factors for kidney stone development in this population.

Methods: After obtaining ethics approval, we retrospectively reviewed the data of patients who underwent HD between 2007 and 2017 at two tertiary care centres. We included patients who have been initiated on HD for at least three months and had computed tomography scans or ultrasound imaging both prior to and post–initiation of HD. Patients with stones antedating HD were excluded. De novo stones were defined as either symptomatic or asymptomatic calculi found on imaging. Epidemiological data, serum analyses, and comorbidities were collected and compared between stone–formers and non–stone–formers using univariate, multivariate logistic regression analysis, and adjusted odds ratio (OR).

Results: A total of 164 patients were included in the analysis, 42.9% (n=70) of whom were females. The mean age was 67.2±15.2 years old, mean body mass index (BMI) was 26.5±5.8kg/m^2, and median dialysis duration was 57.1 months (range 7–201). After HD, 18 (10.9%) patients developed de novo stones and their median dialysis–to–stone duration was 23.5 month (range 7–99). The stone–former group had significantly lower serum magnesium levels (0.97 vs. 0.84 mmol/L; p=0.025), higher serum uric acid levels (292.6 vs. 359.0 mmol/L; p=0.002) and lower 25(OH)VD levels (96.3 vs. 57.6 nmol/L; p=0.01). Additionally, 50% (n=5; p<0.001) of patients with a history of bowel resection developed stones, whereas only 4.1% (n=4; p=0.001) of patients with hypertension developed stones. Binary logistic regression analysis demonstrated that serum uric acid levels (adjusted OR 1.15; 95% confidence interval [CI] 1.03–1.18 for each 10 units of uric acid) and serum magnesium levels (adjusted OR 0.78; 95% CI 0.67–0.95 for each unit of magnesium) were significantly associated with stone formation.

Conclusions: The results of the study indicate that increased serum uric acid levels, decreased serum magnesium levels, decreased 25(OH)VD levels and a history of bowel resection were associated with a higher incidence of stone formation in ESRD HD patients. Less de novo stones were noted in hypertensive patients, in whom hypertension may represent a surrogate for absent urine production.

References:

1. Daudon M, Lacour B, Jungers P, et al. Urolithiasis in patients with end stage renal failure. *J Urol* 1992;147:977–80. https://doi.org/10.1016/S0022–5347(17)37438–4
2. Ozasa H, Ota K. Mechanism of kidney stone formation in chronic hemodialysis patients. *Nephron* 1991;58:242–3. https://doi.org/10.1159/000186426

POD–2.6

Double–blind, prospective, randomized clinical trial comparing regular and Moses modes of holmium laser lithotripsy: Preliminary results

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Introduction: Moses technology has been shown to improve the fragmentation efficiency and reduced stone retropulsion both in in vivo and in vitro studies. However, there are no randomized trials evaluating effectiveness of this new technology during laser lithotripsy. Therefore, the objective was to compare regular and Moses modes of holmium laser lithotripsy in terms of stone fragmentation efficiency and perioperative complications.

Methods: After obtaining ethics approval, a prospective, double–blind, randomized trial was conducted for patients undergoing holmium laser lithotripsy. Patients were randomly assigned to have holmium laser lithotripsy with either regular or Moses modes. Both patients and surgeons were blinded to the laser mode. All procedures were performed by four experienced urologists. Lumenis 120W generator with 200 Moses D/F/L fibers were used for all cases. Demographic data, stone parameters, perioperative complications, and success rates were compared. The degree of stone retropulsion was graded on a Likert scale from 0 (no retropulsion) to 3 (maximum retropulsion).

Results: A total of 66 patients were included in the study (33 per arm). Both groups were comparable in terms of age, and preoperative stone size (1.7 vs. 1.6 cm; p>0.05). When compared with the regular mode, Moses technology was associated with significantly lower fragmentation time (23.4 vs. 17.5 minutes; p<0.05) and total procedural time (53 vs.

42.1 minutes; p<0.05). However, there were no significant differences in terms of lasing time (6.5 vs. 7.1 minutes; p>0.05) and total energy applied to the stones (10.8 vs. 11.5 KJ; p>0.05). When comparing regular and Moses modes, Moses technology was associated with significantly less retropulsion (mean grade 1 vs. 0.4; p<0.05). There was no significant difference between both modes in terms of intraoperative complications (12.1 % vs. 3%; p>0.05). Only one case from the Moses group had a small ureteral perforation requiring prolonged indwelling ureteral stenting. The success rate at the end of one month was comparable between both groups (90.1 vs. 87.9%; p>0.05).

Conclusions: Moses technology is associated with significantly lower fragmentation and procedural times. The reduced fragmentation time could be explained by the significantly lower reropulsion of the stones during laser lithotripsy, thus improving stone fragmentation efficiency.

Podium Session 3: Miscellaneous
June 25, 2018; 1250–1350

POD–3.1

A pilot randomized–controlled trial of the urodynamic efficacy of mirabegron for patients with neurogenic lower urinary tract dysfunction

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Study Groups: Astellas Investigator–Initiated Grant; peer–reviewed funding from the Rick Hansen Institute.

Introduction: Mirabegron is a beta–$_3$ adrenoreceptor agonist used for overactive bladder (OAB). The objective of this study was to determine the urodynamic (UDS) effectiveness of mirabegron in patients with neurogenic lower urinary tract dysfunction.

Methods: We conducted a randomized, double–blind, placebo–controlled study. Patients with spinal cord injury (SCI) or multiple sclerosis (MS) with were recruited. Patients underwent investigations and UDS and were then given mirabegron 25 mg (or placebo) for two weeks. Dose escalation to mirabegron 50 mg (or placebo) then occurred and was maintained for eight weeks, followed by repeat investigations and UDS. The primary outcome measure was UDS bladder capacity. Secondary outcomes included other UDS parameters, pad test, three–day diary, validated symptom scores, and quality of life measures. Intention to treat analysis and ANCOVA models (with adjustment for baseline values) were used and marginal means (MM) are reported; p–value <0.05 was considered significant.

Results: A total of 16 (nine SCI and seven MS) patients were randomized to mirabegron and 16 (10 SCI and six MS) to placebo. At completion, there was no significant difference in urodynamic bladder capacity between mirabegron and placebo (MM 305 vs. 369 mL; p=0.20). There was no significant difference in volume at first NDO (MM 183 vs. 133 mL; p=0.10) and peak pressure of NDO (MM 69 vs. 82 cmH_2O; p=0.25). The effect size for these values was small (<0.20). NDO was documented in 12/16 mirabegron and 13/16 placebo patients and persisted in 11/16 and 12/16, respectively (p=0.66). There was no significant difference in pad weights or voiding diary. Mirabegron therapy did result in a significantly lower symptom burden (total Neurogenic Bladder Symptom Score MM 29 vs. 34; p=0.047), however quality of life scores were similar.

Conclusions: Among patients with SCI or MS, mirabegron may improve patient symptoms, however, there was no significant improvement in UDS parameters, and observed trends were associated with only small effect sizes.

POD–3.2

The early Canadian experience with ATOMS for post–prostatectomy incontinence: A multicentre study

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Introduction: Incontinence related to sphincter weakness is an important potential complication of radical prostatectomy. The ATOMS (Adjustable Trans–Obturator Male System) is self–anchoring transobturator device, which features a non–circumferential adjustable hydraulic cushion first introduced to Canada in 2014. We aim to assess the efficacy and safety profile of the ATOMS sling in a multicentred setting.

Methods: We reviewed postoperative outcomes from eight Canadian centres in male patients undergoing treatment with ATOMS for post–prostatectomy incontinence. The primary outcomes were mean pad change and continence defined as requiring ≤1 pad postoperatively for patients requiring ≥2 pads preoperatively, and 0 pads for those requiring 1 pad preoperatively. Secondary outcomes included patient satisfaction, improvement (>50% change in pad use), and 90–day complications. Other patient demographics, including age, obesity (body mass index [BMI]>35), comorbidities, concurrent radiotherapy, previous incontinence surgery, previous urethral stenosis, and type of prostatectomy, were also examined. Improvement in continence (mean change and absolute change in pads/day) were calculated with t–tests. Patient satisfaction, continence, and surgical complications were evaluated with descriptive statistics and Chi–square.

Results: A total of 160 patients with a mean age of 70.5 years were enrolled with a mean followup of 9.5 months. Preoperatively mean pad use was 4.4 pads/day (1–10), 36.3% of patients reported severe incontinence (>5 pads/day), 31.3% had concurrent radiotherapy, and 16.3% had failed previous incontinence surgery. Initial postoperative pad use was 1.5 pads/day (0–6) before cushion adjustment (p<0.0001) and 0.9 pads/day (0–6) following adjustments (p<0.0001); 58.3% patients underwent adjustment with a mean of 1.4 adjustments (0–7) for a total mean volume of 11.3 mL (0–31). Overall continence rate was 80.0%, while 87.8% of patients experienced >50% improvement and 86.3% of patients were satisfied with the results of surgery. Although patients with concurrent radiotherapy did not differ by preoperative pad usage (4.6 vs. 4.1; p=0.17), they were less likely to be continent (62.5% vs. 87.9%; p<0.0001), improved (77.1% vs. 92.6%; p=0.01), and satisfied (69.8% vs. 93.2%; p<0.0001). Thirty–five patients (22.3%) experienced 90–day complications (any Clavien grade), mostly Clavien I (17.8%), with 4.4% (n=7) of patients experiencing Clavien III complications primarily related to the injection port.

Conclusions: In the short–term, ATOMS is a safe and efficacious device for the treatment of post–prostatectomy incontinence, even in the setting of severe incontinence. Patients with concurrent radiotherapy respond to treatment, but are less likely to be continent, improved, or satisfied.

POD–3.3

Do common urological procedures increase the risk of an infected joint prosthesis?

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Introduction: In order to reduce the risk of an infected total hip arthroplasty (THA) or total knee arthroplasty (TKA), urological guidelines suggest that antibiotic prophylaxis is necessary for certain urological procedures. Our objective was to determine if cystoscopy or transurethral resection of the prostate (TURP) are associated with prosthetic joint infections.

Methods: Using administrative data, we performed a retrospective, population–based cohort study of patients >66 years old in Ontario undergoing

a first time THA/TKA between April 1, 2003 and March 31, 2013. Our exposures were patients who had cystoscopy or TURP within two years of a THA/TKA. Our primary outcome was prosthetic joint infection requiring hospital admission. Cox proportional hazards models were used and we adjusted for numerous covariates.
Results: A total of 113 061 patients met inclusion criteria (44 495 THA and 68 566 TKA). Median age was 74 years, and 40% were male. A total of 8426 (7.5%) of patients had cystoscopy within two years of THA/TKA. In multivariate analysis, there was no significant association between cystoscopy and joint infection (hazard ratio [HR] 1.05; 95% confidence interval [CI] 0.85–1.30; p=0.66). The HR was still non–significant when considering only patients who underwent cystoscopy without antibiotic prophylaxis. A total of 1095 (2.5%) patients had a TURP within two years of THA/TKA. In multivariate analysis TURP was a significant risk factor for peri–prosthetic joint infection (HR 3.42; 95% CI 1.29–9.10; p=0.01).
Conclusions: Contemporary cystoscopy is a very non–invasive procedure and does not appear to be associated with a significant risk of a subsequent peri–prosthetic joint infection. This is contrasted with TURP, which is a more invasive procedure and does appear to be associated with an increased risk of peri–prosthetic joint infections. This has implications for the rationale use of antibiotic prophylaxis and should be taken into account when updating societal antibiotic prophylaxis guidelines.

POD–3.4

The WATER study clinical results: A subgroup analysis of larger prostates from the phase 3, blinded, randomized trial of aquablation vs. transurethral resection of the prostate

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Study Groups: WATER study investigators.

Introduction: Prostate resection for patients with lower urinary tract symptoms (LUTS) remains the gold standard for surgical treatment of benign prostatic hyperplasia (BPH). The length of resection time and the risk of complications during a transurethral resection of the prostate (TURP) are a direct correlation with the size of the prostate. We aimed to compare the safety and efficacy of prostate ablation using aquablation (A) vs. TURP (T) in prostates between 50 and 80 mL in volume and analyze as a subgroup from the WATER study.
Methods: In this randomized, blinded, multicentre, phase 3 trial, men with moderate–to–severe LUTS related to BPH were assigned to TURP using either standard electrosurgery or robotically–assisted waterjet ablation in a 1:2 ratio. A pre–planned subgroup analysis based on prostate volume (<50 vs. ≥50 mL) used the trial's co–primary safety and efficacy endpoint. The primary safety endpoint was the occurrence of Clavien–Dindo Grade 1 (persistent ejaculatory dysfunction, erectile dysfunction, or urinary incontinence) or Grade 2 or higher operative complications at three months. The primary efficacy endpoint was the reduction in International Prostate Symptom Score (IPSS) score at six months.
Results: There were 184 patients enrolled in the study. The mean baseline IPSS score (T: 22.2 vs. A: 22.9; p=0.43), demographic profile, and mean prostate volume (T: 52 mL vs. A: 54 mL; p=0.31) were similar in both arms. Mean operative time was equivalent between the two groups (T: 35.5 vs. A:32.8 minutes; p=0.28), but mean resection time was significantly lower in the aquablation group (28 vs. 4 minutes; p<0.0001). The primary safety endpoint (Clavien–Dindo Grade 1 persistent or Grade 2 or higher event in the first three months) occurred in 19% of aquablation subjects and 43% of TURP subjects (p<0.01), demonstrating superiority of aquablation vs. TURP in men with 50–80 mL prostates. There were 99 patients with a prostate volume greater than 50 mL (T:35 vs. A:64). For men with larger prostates, changes in IPSS were greater after aquablation compared to TURP (by approximately four points; p=0.0056). In an exploratory analysis, IPSS changes were larger with aquablation compared to TURP (by 3.7 points; p=0.0118) in men with baseline maximum flow rates (Qmax) <9 mL/sec. For men with both larger (>50 mL) baseline prostate volume and lower (<9 mL/sec) flow rates, the improvement in IPSS scores was seven points larger in aquablationcompared to TURP (p<0.0001). For men with prostate size <50 mL and maximum flow rate >9 mL/sec, the change with TURP was 4.3 points larger after TURP (p=0.0963).
Conclusions: Analyses demonstrate men with large prostates (50–80 mL) undergoing aquablation show significantly better efficacy and safety results as compared to those undergoing TURP.

POD–3.5

Canadian urology workforce study — the graduating cohort of 2014–16

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Introduction: In Canada, there is a perception that recent urology graduates are having difficulty finding employment and that Canadian urology residency programs are training too many residents. The Canadian Urological Association Health Policy Committee (CAU HPC) set out to quantitatively assess recent Canadian urology graduates regarding their training and employment opportunities in Canada.
Methods: The CUA HPC formulated an anonymous, self–report, and multifaceted 88–question survey to study the graduating cohort of 2014–16 in the following areas: demographics, competency, fellowship training, employment, job resources, work week, income, and job satisfaction. Questions were open–ended, binary, and five–point Likert scale. A web–based survey was created and piloted through the HPC. Descriptive statistics were used to analyze the data.
Results:

- Demographics: 98% of grads are between the ages of 30–39. Respondents were from almost every province in Canada, with 18% from the U.S.
- Fellowships: 85% of respondents are planning to, actively doing, or have completed a fellowship; 93% believe the likelihood of finding a job is better with fellowship training.
- Employment: A permanent staff position with hospital privileges was offered to 28% in residency. The majority (57%) are gainfully employed as a staff urologist. Of those gainfully employed, 29% are in the limited capacity of locum–tenens.
- Income: Of those with a permanent job, 63% report a gross income between $300–500K per year.
- Satisfaction: 70% report satisfaction as a urologist. Only 40% would encourage a medical student to apply to urology.
- Residency enrollment: 86% support contraction of residency positions across Canada.

Conclusions: Despite more challenging job prospects, the majority of Canadian–trained urology graduates are satisfied in their role as a urologist. The cohort supports a contraction of residency positions. Further longitudinal study is warranted to determine if the perception of an overabundance of urologists is matched by actuality.

POD–3.6

Twenty–two–year population–level trends in the surgical management of female stress urinary incontinence in Ontario, Canada

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Study Groups: University of Toronto Functional Urology Research.

Introduction: Since 1999, transvaginal sling (TVS) procedures have been an effective treatment for Canadian women with stress urinary incontinence (SUI). However, complications associated with transvaginal mesh led to warnings from the U.S. Food and Drug Administration (FDA) and Health Canada in 2008 and 2010, respectively. We hypothesized that these warnings would significantly decrease the use of TVS procedures for SUI. Therefore, we sought to characterize trends in the surgical management of SUI in a single–payer healthcare system in Ontario, Canada over a 22–year period.

Methods: We performed an interrupted time–series analysis using segmented regression among women aged 18 years and older undergoing surgical treatment for SUI between January 1, 1994 and December 31, 2016 in Ontario, Canada. The passage of time was considered the primary exposure. The outcome was the annual population–adjusted rates of SUI surgery over time stratified by modality: urethropexy, TVS, abdominal/vaginal sling, and transurethral bulking agents.

Results: We identified 120 999 women who underwent SUI surgery between 1994 and 2016. The total number of SUI procedures did not significantly change from 1994–2000 (mean 95 per 100 000 population; p=0.89). From 2000–2009, the total number of SUI procedures significantly increased (95 to 147 per 100 000 population; p<0.001) driven by a significant increase in TVS procedures (19 to 129 per 100 000 population; p<0.001). During this time period, the number of urethropexy, abdominal/vaginal sling, and bulking agent procedures significantly decreased (p<0.001). After 2009, annual rates of any SUI procedure decreased, a trend which continued during the remainder of the study period (147 to 64 per 100 000 population; p<0.001). This trend was associated with a significant decrease in TVS procedures (130 to 60 per 100 000 population; p<0.001) over the same period, as well as significant declines in each of the other SUI treatment modalities (p<0.001).

Conclusions: This large, population–based cohort demonstrates a significant influence of the FDA and Health Canada warnings on patient and physician behaviour regarding the management of SUI. Prior to 2009, despite decreased use of other surgical procedures, the overall number of SUI surgeries performed was significantly increasing, driven by increasing use of TVS procedures. Following the regulatory warnings, the overall rate of SUI procedures significantly declined due to a decrease in the use of both TVS procedures and other operative interventions. These data suggest that the regulatory warnings had a significant effect on how patients and physicians approach surgical management of SUI. Further, it suggests that many women may be living with untreated SUI.

Podium Session 4: Other Oncology
June 26, 2018; 1105–1205

POD–4.1

Predictors of a positive genetic test result in patients with a suspected hereditary kidney cancer syndrome: Results from a provincial medical genetics unit

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Introduction: Current guidelines[1] recommend genetic referral for patients with renal cell carcinoma (RCC) and high risk features: young age, bilateral/multifocal tumours, strong family history, history of pneumothorax, non–clear–cell histology, dermatological findings, presence of associated tumours. Data on outcomes of patients referred for genetic testing as per current guidelines are limited. A single–centre study[2] found an association between young age and a positive genetic test in patients evaluated for hereditary RCC. The purpose of our study is to delineate risk factors associated with a positive genetic test in a real–life cohort of patients referred to medical genetics for evaluation of hereditary RCC.

Methods: A retrospective chart review of patients referred to medical genetics for genetic evaluation of a hereditary kidney cancer from 2006–2016 in Nova Scotia, Canada, was performed. Univariate and multivariate analyses using Fisher's exact test were used to determine predictors of a positive test result.

Results: A total of 109 patients were referred, 85 evaluated, and 64 tested. Five were excluded from analysis (four non–RCC; one unavailable result). Five (8.5%) had a positive test (three Birt–Hogg–Dube, one CS, one TS). Mean age at time of RCC diagnosis was 54 years. Thirty–two (54%) had multifocal/bilateral tumours, 26 (44%) had a positive family history, 26 (44%) had non–clear–cell histology, and 10 (17%) had tumours outside the kidney. Dermatological findings (facial fibrofolliculomas) (p=0; odds ratio [OR] 42) and family history (p=0.037; OR 7.2) were the only predictors of a positive test.

Conclusions: We identified dermatological findings and family history as the only predictors of a positive genetic test in patients undergoing evaluation for hereditary RCC. Our patient population represents the largest of its kind in the literature. This study suggests that current referral criteria may be too broad for application in a real–life patient population, but further evaluation with prospective trials is needed.

References:

1. Reaume M, Graham GE, Tomiak E, et al. Canadian guideline on genetic screening for hereditary renal cell cancers. *Can Urol Assoc J* 2013; 7: 319–23. https://doi.org/10.5489/cuaj.1496
2. Stratton K et al. Outcome of genetic evaluation of patients with kidney cancer referred for suspected hereditary cancer syndromes. *Urol Oncol* 2016; 34: 238e1–238e7

POD–4.2

Patterns of bladder cancer recurrence after open and robotic radical cystectomy

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Introduction: The objective of this study was to compare rates and patterns of recurrence after open radical cystectomy (ORC) vs. robot–assisted radical cystectomy (RARC) with intracorporeal urinary diversion (ICUD) in a large contemporary cystectomy series.

Methods: We performed a retrospective review of 837 consecutive patients who underwent ORC (n=598) or RARC with ICUD (n=238) for bladder cancer between August 2009 and October 2016. Recurrences were classified as local, distant, or secondary urothelial carcinomas. Kaplan–Meier method was used for recurrence–free survival (RFS) estimates. One–year recurrence patterns were assessed. Multivariate Cox regression models were used to determine the impact of surgical technique on the risk of recurrence.

Results: Patients with RARC with ICUD were more likely to have ileal conduit urinary diversion (64% vs. 29%; p<0.01) and have extravesical disease (38% vs. 30%; p=0.03) (Table 1; available at https://cua.guide/). There was no difference in RFS for the entire cohort (Fig. 1; available at https://cua.guide/), and also by pathological stage: organ–confined disease (pT0–pT2, n=565), extravesical disease (pT3–pT4, n=270), and node–positive disease (pN+, n=183). On multivariate Cox regression analysis, RARC with ICUD was not an independent predictor of recurrence after adjusting for age, sex, perioperative chemotherapy, pathological tumour and nodal stage, lymphovascular invasion, and positive surgical margins (hazard ratio [HR] 1.05; 95% confidence interval [CI] 0.75–1.48; p=0.8). There were no significant differences in the number of local or distant recurrences within one between ORC and RARC (p=0.6). Further, the patterns of local and distant recurrences were similar between ORC and RARC, in particular, with respect to peritoneal carcinomatosis and extrapelvic lymph node metastasis.

Conclusions: This large contemporary series suggests that surgical technique is not an independent predictor of recurrence after radical cystectomy for bladder cancer. These data show no differences in the rates or patterns of local or distant recurrence between ORC and RARC with ICUD.

POD–4.3

Optimizing the use of neoadjuvant chemotherapy in micropapillary bladder cancer: Validation of proposed risk classifiers

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Introduction: Micropapillary urothelial cell cancer (MPUC) is a known aggressive variant of bladder cancer. Neoadjuvant chemotherapy (NAC) has a proven survival benefit in muscle–invasive disease, however, its benefit in variant histology is less defined. Prior work by our group identified three distinct risk groups of surgically resectable MPUC (lower–risk=cT1, no hydronephrosis; high–risk = ≥cT2 no hydronephrosis; highest–risk=hydronephrosis). Herein, we aim to confirm that NAC's survival benefit is limited to the high–risk group.

Methods: Clinical and pathological data were collected on all patients with MPUC histology who underwent radical cystectomy (RC) with or without NAC at MD Anderson Cancer Center from 2003–2017. Using our proposed MPUC risk stratification, patients were classified as lower–, high–, or highest–risk. Overall survival (OS) was compared based on NAC status and MPUC risk stratification.

Results: A total of 117 patients were identified with a median age of 70 years (range 43–89); 83 patients were ≥T2 and 34 patients T1. Median followup was 22.1 months (range 2–123). Sixty–four patients received NAC. Of the

34 patients who were down–staged at RC, 27(79%) received NAC. NAC conferred no OS benefit (p=0.69) when considering all patients. Lower–risk patients had a median OS of 100 months, with high– and highest–risk median OS being 41 and 21, respectively (p≤0.001). High–risk patients receiving NAC had a survival benefit compared to those not receiving NAC (p=0.04). NAC provided no survival benefit in lower– and highest–risk groups.
Conclusions: In this expanded cohort, NAC appears to benefit only high–risk patients, as defined by our classification system. Although pathological down–staging occurred with NAC use, it did not translate into a survival benefit when considering all patients.

POD–4.4

Survival following upfront cytoreductive nephrectomy vs. targeted therapy for metastatic renal cell carcinoma

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Introduction: The optimal sequence of cytoreductive nephrectomy (CN) and targeted therapy (TT) for patients with metastatic renal cell carcinoma (mRCC) is unknown. Herein, we compared overall survival (OS) between patients with mRCC receiving initial CN with or without subsequent TT vs. initial TT with or without subsequent CN.
Methods: The National Cancer Database was used to identify patients diagnosed between 2006 and 2013 with RCC that was metastatic at diagnosis who received CN, TT, or both. Those with other prior cancer history were excluded. The cumulative incidence of receiving TT after CN and CN after TT were evaluated in competing risks analyses. To account for treatment selection bias, inverse probability of treatment weighting (IPTW) was performed based on the propensity to receive initial CN or TT. OS from diagnosis was compared using Cox regression. Sensitivity analyses were performed.
Results: The cohort included 15 068 patients, of whom 6731 underwent initial CN and 8337 underwent initial TT. At six months from diagnosis, the probability of receiving TT after CN was 48.0%, with 15.3% of patients having died after initial CN prior to receiving TT. Meanwhile, the probability at six months of undergoing CN after initial TT was 4.7%, with 44.9% of this group having died prior to undergoing CN. In the IPTW analysis, initial CN was associated with improved OS compared to initial TT (median 16.5 vs. 9.2 months; hazard ratio [HR] 0.61; 95% confidence interval [CI] 0.59–0.64; p<0.001). Findings were similar in all sensitivity analyses (propensity score matching and adjustment; regression adjustment; six–month landmark analysis; clear–cell and non–clear–cell mRCC subsets; exclusion of patients who had metastasectomy).
Conclusions: Given a greater likelihood of receiving multimodal therapy and an associated OS benefit, these data support CN as the initial approach for mRCC in appropriate surgical candidates. Continued efforts to establish the optimal multimodal approach in these patients are warranted.

POD–4.5

Oncological outcomes from a randomized controlled trial comparing open and robot–assisted laparoscopic radical cystectomy for bladder cancer

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Introduction: There is a paucity of long–term oncological outcomes comparing robot–assisted laparoscopic radical cystectomy (RARC) and open radical cystectomy (ORC). Herein, we report secondary endpoints of cancer–specific outcomes from our prospective, randomized trial comparing RARC and ORC.
Methods: Between 2010 and 2013, 118 patients with clinical stage Ta–T3 bladder cancer (BCa) were randomized, with 60 undergoing RARC and 58 ORC. Recurrent Bca was defined according to the first site of disease detection. Disease location was defined as: 1) distant recurrence; 2) local pelvic recurrence; or 3) abdominal recurrence (carcinomatosis or abdominal wall involvement). Kaplan–Meier methods were used to estimate recurrence and cancer–specific survival after radical cystectomy (RC), and the log–rank test to compare differences in recurrence and cancer–specific survival rates.
Results: The median followup was 4.9 years (interquartile rnage [IQR] 3.9, 5.9). There were 44 patients with recurrences: 25 after ORC and 19 after RARC. In total, there were 36 deaths, including 19 deaths from BCa. Overall recurrence rates and BCa–specific death rates were not statistically different between groups (p=0.4 and p=0.4, respectively). Overall, we found abdominal recurrences in five RARC patients and two ORC patients. Two of the five RARC patients with abdominal recurrences had organ–confined disease, including one with HG, pTa BCa. In the ORC group, both patients had non–organ–confined disease.
Conclusions: Our secondary analysis of cancer outcomes revealed no significant difference in disease recurrence rates or cancer–specific survival. Observed patterns of recurrence based on surgical technique were of interest, however, the study was not powered to establish differences in patterns of recurrence. Future studies are needed to determine if variations in sites of recurrence exist based on surgical technique.

POD–4.6

Validation of Real–time, Intraoperative, Surgical Competence (RISC) assessments linked to clinically relevant patient outcomes: A model of competency assessment in urology

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Introduction: We aimed to determine if intraoperative evaluations of technical skill using Real–time, Intraoperative, Surgical Competence (RISC) assessments predicts clinical and operative outcomes in real patients.
Methods: Subjects: 1) surgeons performing transurethral resection of bladder tumour (TURBT) and 2) patients with a bladder tumour requiring TURBT. Study intervention: live TURBTs (n=187) were prospectively recorded and evaluated in a blinded fashion by four urologic surgeons as to the overall technical quality of the TURBT using RISC. Patients were followed for 18 months for evidence of tumour recurrence. RISC scores were correlated with case–matched clinical and operative patient outcomes. The RISC assessment was developed following a blinded review by expert surgeons of unedited surgical videos of TURBT cases both with and without bladder tumour recurrence following surgery, with the goal to identify fundamental technical skill domains influencing a tumour recurrence/recurrence–free state. Twenty competency domains were identified and used to create the RISC assessment. The technical skill domains comprising the RISC assessment were structured as a composite of previously validated global rating scales and final product scores.
Results: RISC scores discriminated between experienced and novice surgeons and correlated significantly with the number of previous surgical cases performed (r=0.2; p=0.04). Bladder tumour recurrence: RISC assessments of surgical skill during TURBT correlated significantly with rates of cystoscopic bladder tumour recurrence (Fig. 1; available at https://cua.guide/). Both global ratings of surgical performance and final surgical product ratings were significantly higher (suggestive of superior technical skill) in cases without evidence of bladder tumour recurrence (Fig.1; available at https://cua.guide/).
Conclusions: RISC assessments of surgical skills demonstrated construct and predictive validity for bladder tumour recurrence following TURBT. Similar methodology can be applied to develop RISC assessments for a variety of surgical procedures and disease states.

Poster Session 1: Prostate Cancer I
June 25, 2018; 0800–0930

MP–1.1

Mental health outcomes in adult men with a history of prostate cancer diagnosis

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Study Groups: Dalhousie Medical Research Foundation – Soillse Fund.

Introduction: We aimed to examine the burden of mental health in a population–based cohort of adult men with localized prostate cancer residing in one of three Maritimes provinces in Canada and to evaluate associations with current urinary, sleep problems, and relationship difficulties.

Methods: A total of 151 men, who were 50 years of age or older (mean 68.39, standard deviation [SD] 6.45 years) with a history of clinically localized prostate cancer completed an online 15–minute survey between May 2017 and March 2018 assessing patient reported quality of life outcomes. The primary outcome of interest was a validated assessment of mental health disorder, Kessler Psychological Distress Scale (K10).[1,2] Urinary problems were assessed using the International Prostate Symptom Score (IPSS).[3] Sleep and relationship difficulties were assessed using the Screening for Distress questionnaire.[4]

Results: A total of 16.1% men scored positive for mental health issues at the time the survey was completed. In this sample, 12.6% of participants were currently on active surveillance and 87.4% reported having been treated with active treatment modalities (e.g., surgery, radiation, hormonal manipulation). Half of the sample (50%) reported mild, 45% moderate, and 5% severe urinary problems. Relative risk was 1.70 (95% confidence interval [CI] 1.21–2.38) for screening positive for mental health problems among survivors with moderate to severe urinary problems compared with those with mild urinary problems. Relative risk for screening positive for mental health problems among survivors with sleep problems and current worries about relationship difficulties was 3.24 (95% CI 1.53–6.86) and 2.99 (95% CI 1.43–6.26), respectively, compared with those with no sleep problems and worries about relationship difficulties.

Conclusions: Older men with urinary, sleep, and relationship difficulties problems are at higher risk of having mental health problems after diagnosis and treatment of prostate cancer.

References:

1. Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non–specific psychological distress. *Psychol Med* 2002;32:959–76. https://doi.org/10.1017/S0033291702006074
2. Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale (k10). *Aust N Z J Public Health* 2001;25:494–7. https://doi.org/10.1111/j.1467–842X.2001.tb00310.x
3. Barry MJ, Fowler FJ, O'leary MP, et al. American Urological Association symptom index for benign prostatic hyperplasia. *J Urol* 1992;148:1549–57. https://doi.org/10.1016/S0022–5347(17)36966–5
4. Vodermaier A, Linden W. Emotional distress screening in Canadian cancer care: A survey of utilization, tool choices and practice patterns. *Oncol Exchange* 2008;7:37–40.

MP–1.2

Are urologic surgeons performing radical prostatectomy at the University of Alberta providing high–quality and uniform prostate cancer control?

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Introduction: The 2010 Canadian Urological Association consensus guideline examining surgical quality performance for radical prostatectomy (RP) states that urologic surgeons should achieve an unadjusted positive surgical margin (R1) rate <25% for organ–confined (i.e., pT2) disease. To date, no study has examined whether Canadian urologic surgeons are achieving this benchmark. The primary objective of the current study was to determine the proportion of urologic surgeons achieving an unadjusted pT2–R1 rate <25%. A secondary objective was to determine whether between–surgeon variation (i.e., heterogeneity) exists in pT2–R1 rates.

Methods: A retrospective analysis of prospectively collected data from the University of Alberta (UA) Radical Prostatectomy Database was performed. Men who underwent RP for clinically localized prostate cancer between September 2007 and August 2017 by one of nine urologic surgeons were analyzed. The primary outcome was pT2–R1 rate. General anatomical pathologists at two sites reviewed RP specimens. A R1 was defined as the presence of cancer at the inked margin. Multivariable random effects models were used to evaluate heterogeneity in pT2–R1 rates after adjustment for case mix. Statistical tests were two–sided ($p \leq 0.05$).

Results: Pathological data were evaluable for 1870 patients; 1323 of 1870 patients (71%) had pT2 disease. Six of nine surgeons achieved unadjusted pT2–R1 rates <25%. Three surgeons had unadjusted pT2–R1 rates ≤15%, whereas three surgeons had unadjusted pT2–R1 rates ≥28%. Multivariable random effects models showed statistically significant between–surgeon variation in pT2–R1 rates (p=0.024).

Conclusions: UA urologic surgeons are not all achieving the CUA pT2–R1 benchmark for surgical quality performance for radical prostatectomy. A patient's likelihood of achieving optimal cancer control differs depending on which urologic surgeon performs his surgery. Surgical quality performance initiatives designed to improve pT2–R1 rates of radical prostatectomy are warranted.

MP–1.3

A quantitative assessment of residual confounding in the comparison between surgery and radiotherapy in the treatment of non–metastatic prostate cancer

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Introduction: Observational comparisons of surgery and radiotherapy as prostate cancer treatments may be affected by residual confounding. We sought to quantify the degree of this bias in men treated for non–metastatic prostate cancer, both between treatment modalities and compared to men without prostate cancer.

Methods: We performed a population–based, retrospective cohort study of men treated for non–metastatic prostate cancer in Ontario, Canada from 2002–2009. Patients treated with surgery and radiotherapy were matched on demographics, comorbidity, and cardiovascular risk factors. The primary outcome was non–prostate cancer mortality. The Fine & Gray subdistribution method with generalized estimating equations was used to compare outcomes. Additionally, we compared these patients with prostate cancer to the general population. We used a previously published technique to quantify the prevalence and strength of residual confounding necessary to account for observed results.

Results: Of 20 651 eligible men, 10 786 (5393 pairs) were matched. The 10–year cumulative incidence of non–prostate cancer mortality was higher among patients who underwent radiotherapy (12%) than surgery (8%; adjusted subdistribution hazard ratio 1.57; 95% confidence inetrval [CI] 1.35–1.83). Both groups had significantly lower rates of non–prostate cancer mortality than matched men without prostate cancer (18%; p<0.001). Hypothetical residual confounders would have to be both strongly associated with non–prostate cancer mortality (HRs in excess of 2.5) and have highly differential prevalence in order to nullify the observed effect.

Conclusions: Patients treated for non–metastatic prostate cancer have significantly lower non–prostate cancer mortality than men in the general population. We identified the magnitude of potential residual confounders to account for differences in treatment effects for prostate cancer.

MP–1.4

Development of a management algorithm for prostate cancer patients with a biochemical recurrence after radical therapy

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Introduction: As new systemic treatments become available earlier in the course of recurrent prostate cancer, it will become increasingly important for physicians to optimize the management of patients who develop a biochemical recurrence post–radical local therapy. The Genitourinary Research Consortium (GURC) Best Practice Working Group identified a need to develop a monitoring and treatment algorithm to support the optimal management of patients with non–metastatic prostate cancer.

Methods: A national working group of uro–oncologists, radiation oncologists, and medical oncologists engaged in a series of best practice consensus discussions to examine the clinical trial evidence (literature review) and identify additional practice recommendations (expert opinion) that could be incorporated into an algorithm for the monitoring and treatment of patients with prostate cancer with a biochemical recurrence post–radical local therapy.

Results: Multiple consensus meetings led to the integration of evidence from randomized controlled trials and key retrospective studies, which was supplemented by expert consensus opinion in areas where evidence was lacking. This led to the development of an algorithm (Fig. 1; available at https://cua.guide/) that provides practice guidance on the definition of biochemical failure, when to refer for local salvage options, recommended prostate–specific antigen (PSA) thresholds for use of intermittent and continuous androgen–deprivation therapy (ADT), and the use of PSA doubling time to guide frequency of laboratory and imaging investigations once patients have developed castrate–resistant prostate cancer.

Conclusions: With the ever–changing prostate cancer treatment landscape and the trend to earlier use of systemic therapy, physicians are continually challenged to adopt emerging clinical evidence into practice. Management algorithms are one of the key clinical practice tools that can enable physicians to provide evidence–based and consensus–based care to patients with non–metastatic prostate cancer .

MP–1.5

Efficacy and tolerability of first–line abiraterone + prednisone vs. enzalutamide for metastatic castration–resistant prostate cancer in men ≥80 years: A retrospective study

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Introduction: Abiraterone + prednisone (ABI) and enzalutamide (ENZA) are both first–line treatment options for metastatic castration–resistant prostate cancer (mCRPC) with comparable efficacy. In men ≥75 years, ABI and ENZA are associated with higher rates of adverse events. For very elderly patients, the efficacy and tolerability of ABI and ENZA have not been directly compared.

Methods: We conducted a retrospective analysis in patients ≥80 years of age who received ABI or ENZA for first–line treatment of mCRPC between July 2009 and September 2016 at the BC Cancer Agency. Medical records were reviewed for clinical characteristics and outcomes including prostate–specific antigen (PSA) response rate (PSA50) (decrease of ≥50% from baseline), time to first progression (TTP) (PSA [PCWG3 criteria], radiographic or clinical progression), and overall survival (OS).

Results: There were 106 patients in the ABI cohort and 104 in the ENZA cohort. Baseline age, Eastern Cooperative Oncology Group performance score (ECOG PS), Charlson Comorbidity Index, serum alkaline phosphatase (ALP) and lactate dehydrogenase (LDH), and sites of metastasis were similar between cohorts, but a higher proportion of patients in the ENZA cohort had a time to castration resistance <12 months (Table 1; available at https://cua.guide/). The PSA50 was 43.4 % for ABI vs. 77.9 % for ENZA (p<0.001, X^2). The median TTP was 4.7 months for ABI vs. 8.0 months for ENZA (hazard ratio [HR] 1.52; 95% confidence interval [CI]1.12–2.08). Treatment was discontinued for toxicity in 8.5% of patients for ABI and 13.5% for ENZA (p=0.276, X^2). At least one dose reduction due to toxicity was required for 7.5% of patients for ABI vs. 29.8% for ENZA (p<0.001, X^2). For patients in the ENZA cohort who had a dose reduction, the median TTP was 11.8 months vs. 6.2 months for those without (HR 0.65; 95% CI 0.40–1.08). Median OS was 13.2 months for ABI vs. 18.7 months for ENZA (HR 1.20; 95% CI 0.89–1.63).

Conclusions: Despite more dose reductions due to toxicity, the PSA50 and TTP were superior for the ENZA cohort compared to the ABI cohort. Dose reductions in the ENZA cohort did not negatively affect TTP. The retrospective nature of the analysis is a limitation of this study.

MP–1.6

Prostate cancer incidence and mortality among men using statins and non–statin lipid–lowering medications in Saskatchewan, 1990–2014

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Study Groups: Funded by National Institutes of Health National Institute on Aging under Award Number R01AG038453.

Introduction: We sought to rigorously test the hypothesis, which was based on previous small, short–duration and biased studies, that cholesterol–lowering drugs (statins and non–statin lipid–lowering medications [NSLLM]) have an effect on prostate cancer (PCa) risk (incidence and severity) in men.

Methods: A retrospective cohort study of men with no history of PCa diagnosis was conducted by abstracting prescription and health service records for 249 986 men aged 40–89 years covered by Saskatchewan Health between January 1, 1990 and December 31, 2014 and comparing first–time statin and NSLLM users with age–matched non–users and glaucoma medication users (control for healthcare utilization bias) for PCa incidence, metastases at diagnosis, and PCa mortality over 25 years using survival analysis.

Results: In comparing statin users to non–users, a weak association was detected with increased PCa incidence (adjusted hazard ratio [HR] 1.07; 95% confidence interval [CI] 1.02–1.12) that disappeared when statin users were compared with glaucoma medication users. In contrast, substantial protective associations were observed between statin use and metastatic PCa and PCa mortality (adjusted HRs 0.69; 95% CI 0.61–0.79, and 0.73; 95% CI 0.66–0.81, respectively), which were stronger when compared with glaucoma medication users. Similar associations were found between NSLLM and PCa incidence, severity, and mortality.

Conclusions: Our analyses provide the most comprehensive findings to date that statins may reduce the risk of metastatic PCa and PCa mortality, and the first to demonstrate that NSLLM have similar effects, supporting a cholesterol–based mechanism.

MP–1.7

Salvage radical prostatectomy vs. salvage cryotherapy for localized radiorecurrent prostate cancer: Comparative long–term outcomes

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Introduction: Some men with biochemical failure following radical radiotherapy for prostae cancer (PCa) remain with clinically localized disease. Salvage radical prostatectomy (sRP) and salvage cryotherapy (sCryo) can lead to durable recurrence–free survival. There is paucity of long–term comparative outcomes between them. We compared mature data from two large, single–centre cohorts.

Methods: Men undergoing salvage treatment at two academic centres between 1988 and 2004 were identified and prospectively collected data were compared. One centre performed sRP and the other performed sCryo. Functional outcomes were assessed at one year. Outcomes were overall (OS) and disease–specific survival (DSS), freedom from castrate–resistant prostate cancer (CRPC) and from androgen deprivation therapy (ADT), and treatment–related adverse effects. Data were compared using the Kaplan–Meier method.

Results: A total of 251 men underwent sRP and 187 were treated with sCryo. Men undergoing sCryo were older than those undergoing sRP (median 69 vs. 65.8 years; p<0.001). Presalvage prostate–specific antigen (PSA) values and Gleason scores were similar. Median followup was 105 (interquartile range [IQR] 100.3) and 118 months (IQR 136.6) for sCryo and sRP, respectively. Compared with sCryo, sRP was associated with higher 10–year freedom from ADT (64.7±3.7% vs. 42.7± .8%; p=0.002) and from CRPC (74.5±3.5% vs. 56.5±5.3%; p=0.02). No significant differences were noted for 10–year OS (74.7±3.2% vs. 75.4±3.7%; p=0.55) or DSS (84.5±2.7% vs. 92.0±2.5%; p=0.06) (Fig. 1; available at https://cua.guide/). Urinary incontinence was more frequent with sRP (128/212 [60.4%] vs. 74/176 [42.0%]; p<0.001), and was more likely to be severe (71/221 [32.1%] vs. 5/176 [2.8%]; p<0.001). Lower urinary tract symptoms occurred more commonly after sCryo (48.1% vs. <5%; p<0.001). De novo erectile dysfunction occurred in 99/114 (86.8%) and 29/30 (96%) treated with sRP and sCryo, respectively (p=0.13).

Conclusions: sRP and sCryo are viable options for select men with radiorecurrent localized prostate cancer, with similar long–term survival, but differing morbidity profiles.

MP–1.8

External validation of the novel 2014 ISUP Gleason grading groups in a large, contemporary, Canadian cohort

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Introduction: Since its introduction, the Gleason score (GS) has been the most universally accepted grading system for prostate cancer (PCa).[1] After multiple revisions, the original GS, which consisted of 25 possibilities, evolved to a traditional three–tiered Gleason grading (TGG). Due to the lack of granularity in the TGG strata, in 2013, Pierorazio et al[2] introduced a novel five–tiered gleason grading groups (GGG), suggesting better discrimination and finer definition of risk based on biochemical recurrence (BCR) outcomes.[3] More specifically, there was a distinct separation of the intermediate TGG (7), into GGG 2 (3+4) and GGG 3 (4+3), as well as the high risk TGG into GGG 4 (8) and GGG 5 (9,10). We sought to test the discriminant ability of the GGG[2] for predicting BCR after robot–assisted radical prostatectomy (RARP) in a large, contemporary, Canadian cohort.

Methods: A total of 621 patients who underwent RARP in two major Canadian centres were identified in a prospectively maintained Canadian database between 2006 and 2016. Followup endpoint was BCR. Log–rank test, univariable and multivariable Cox regression analyses were used.

Results: Mean followup was 27.9 months. All five ISUP GGG independently predicted BCR. Statistically significant differences in BCR rates were found between GGG 2 and GGG 3 strata (p<0.001). No statistically significant differences in BCR rates were found between GGG 4 and GGG 5 strata (p= 0.3). Relative to GGG 1, GGG 2, GGG 3, GGG 4 and GGG 5 yielded a 1.10, 3.44–, 4.18–, and 4.74–fold hazard ratio (HR) difference, respectively.

Conclusions: This population–based Canadian cohort study confirms the added discriminant property of the novel ISUP grading, specifically for GGG 2 and GGG 3 strata. No difference, however, was observed between GGG 4 and GGG 5 likely due to the lower number of patients in these groups. As such, after external validation, the 2014 ISUP GGG appears to retain clinical prognostic significance in a Canadian population.

References:

1. Gleason DF, Mellinger GT. Prediction of prognosis for prostatic adenocarcinoma by combined histological grading and clinical staging. *J Urol* 1974;111:58–64. https://doi.org/10.1016/S0022–5347(17)59889–4
2. Pierorazio PM, Walsh PC, Partin AW, et al. Prognostic Gleason grade grouping: Data based on the modified Gleason scoring system. *BJU Int* 2013;111:753–60. https://doi.org/10.1111/j.1464–410X.2012.11611.x
3. Pompe RS, Davis–Bondarenko H, Zaffuto E, et al. Population–based validation of the 2014 ISUP Gleason grade groups in patients treated with radical prostatectomy, brachytherapy, external beam radiation, or no local treatment. *Prostate* 2017;77:686–93. https://doi.org/10.1002/pros.23316

4. Epstein JI, Allsbrook WC Jr, Amin MB, et al. The 2005 International Society of Urological Pathology (ISUP) consensus conference on Gleason grading of prostatic carcinoma. *Am J Surg Pathol* 2005;29:1228–42.https://doi.org/10.1097/01.pas.0000173646.99337.b1
5. Epstein JI, Egevad L, Amin MB, et al. The 2014 International Society of Urological Pathology (ISUP) consensus conference on Gleason grading of prostatic carcinoma: Definition of grading patterns and proposal for a new grading system. *Am J Surg Pathol* 2016;40:244–52.
6. Epstein JI, Zelefsky MJ, Sjoberg DD, et al. A contemporary prostate cancer grading system: A validated alternative to the Gleason score. *Eur Urol* 2016;69:428–35. https://doi.org/10.1016/j.eururo.2015.06.046
7. Spratt DE, Cole AI, Palapattu GS, et al. Independent surgical validation of the new prostate cancer grade grouping system. *BJU Int* 2016;118:763–9. https://doi.org/10.1111/bju.13488
8. Berney DM, Beltran L, Fisher G, et al. Validation of a contemporary prostate cancer grading system using prostate cancer death as outcome. *Br J Cancer* 2016;114:1078–83. https://doi.org/10.1038/bjc.2016.86
9. D'Amico AV, Whittington R, Malkowicz SB, et al. The combination of preoperative prostate–specific antigen and postoperative pathological findings to predict prostate specific antigen outcome in clinically localized prostate cancer. *J Urol* 1998;160:2096–101. https://doi.org/10.1097/00005392–199812010–00041
10. He J, Albertsen PC, Moore D, et al. Validation of a contemporary five–tiered Gleason grade grouping using population–based data. *Eur Urol* 2017;71:760–3. https://doi.org/10.1016/j.eururo.2016.11.031
11. Loeb S, Folkvaljon Y, Robinson D, et al. Evaluation of the 2015 Gleason grade groups in a nationwide population–based cohort. *Eur Urol* 2016;69:1135–41. https://doi.org/10.1016/j.eururo.2015.11.036
12. Spratt DE, Jackson WC, Abugharib A, Tomlins SA, Dess RT, Soni PD, et al. Independent validation of the prognostic capacity of the ISUP prostate cancer grade grouping system for radiation treated patients with long–term followup. *Prostate Cancer Prostatic Dis* 2016;19(3):292–7. https://doi.org/10.1038/pcan.2016.18
13. Tsao CK, Gray KP, Nakabayashi M, et al. Patients with biopsy Gleason 9 and 10 prostate cancer have significantly worse outcomes compared to patients with Gleason 8 disease. *J Urol* 2015;194:91–7. https://doi.org/10.1016/j.juro.2015.01.078

MP–1.9

Real–world evidence in patient–related outcomes of metastatic castrate–resistant prostate cancer patients treated with abiraterone acetate plus prednisone

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Introduction: Oral androgen biosynthesis inhibitor, abiraterone acetate plus prednisone (AA+P), has shown to improve survival and patient–related outcomes (PROs) in clinical trials. The COSMiC study (Canadian Observational Study in Metastatic Cancer of the Prostate; ClinicalTrials.gov: NCT02364531) set out to prospectively amass real–world data on metastatic castrate–resistent prostate cancer (mCRPC) patients managed with AA+P within Canada. Here, we report the interim analysis of their PROs.

Methods: At a median followup of 33.8 months, 264 patients were enrolled from 39 sites. Their Functional Assessment of Cancer Therapy–Prostate (FACT–P) and Montreal Cognitive Assessment (MoCA) were evaluated at baseline then at weeks 12, 24, 48, and 72 after AA+P initiation. A 10–point drop denotes clinically significant degradation in FACT–P and a total MoCA score of ≥26 is considered normal. Descriptive analysis was used with continuous variables. Changes from baseline were summarized using mean (standard deviation [SD]).

Results: At a median age of 77 years among 264 patients, their mean baseline FACT–P total score was 111.2 (19.44), with a <3–point absolute change from baseline at subsequent assessments, denoting no clinically significant change in functional status over time. Their mean baseline MoCA score was 25.2 (4.50), yet all subsequent assessments scored above 26 and a mean absolute change from baseline of <1, showing an absence of cognitive decline over time. Prostate–specific antigen (PSA) value was available for 221 patients; 64.3% (142/221) and 34.4% (76/221) achieved a PSA decline of >50% and 90%, respectively. All–grade treatment–related adverse events were reported in 63 patients, with 11% who have had AA+P discontinuation/interruption.

Conclusions: COSMiC represents the largest Canadian mCRPC cohort treated with AA+P with real–world prospective evaluation of PROs. This data demonstrated the maintenance in quality of life and cognitive status over the course of the study, and underscores the importance of PRO use in this complex patient population.

MP–1.10

Outcomes of surgical management of localized high–risk prostate cancer: Results from the Prostate Cancer Canadian Collaboration

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Introduction: Men with localized high–risk prostate cancer (HRPCa) represent those at highest risk of experiencing disease–specific morbidity and mortality. There is limited data on the outcomes of men with HRPCa undergoing radical prostatectomy (RP). We describe the results of the Prostate Cancer Canadian Collaboration.

Methods: We identified 702 men with cN0M0 HRPCa treated with RP at five Canadian tertiary referral centres between 2005 and 2017. D'Amico criteria was used to define high–risk disease. Data were collected retrospectively. Logistic regression was used to determine predictors of: adverse surgical pathology, biochemical failure (BCF) (prostate–specific antigen [PSA] >0.19 at first postoperative PSA) and biochemical recurrence (BCR).

Results: The median age was 64 years. Median preoperative PSA was 9 ng/mL (interquartile range [IQR] 6.0–18.25). Seventy–four percent had Grade Group 4 or 5 on biopsy and 23% had ≥cT2C; 53%, 42%, and 4% of men underwent open, robotic, and laparoscopic surgery, respectively. Histology showed ≥pT3 disease in 71% of men and 39% had positive margins. Nineteen percent received an extended lymph node dissection, with 14% having pN1 disease. Thirty–one percent and 21% received adjuvant and salvage therapies, respectively. Sixteen percent of men experienced BCF and 36% of men experienced BCR. At a median followup of 49 months, 64% remained disease free. Table 1 (available at https://cua.guide/) depicts predictors of poor outcomes.

Conclusions: With a median followup of over four years, close to two–thirds of men who underwent surgery for HRPCa remain disease–free. These findings confirm that surgery remains an excellent option for this population. Of interest, prior treatment with active surveillance predicted BCF, which may have implications for patient counselling. Receiving open surgery was a determinant of positive margins and positive nodal disease when compared to a robotic approach. In the absence of prospective data, this large, multi–institutional analysis may help guide practitioners in their approach to men with HRPCa.

MP–1.11

Prognostic factors in radium–223 treatment: An early Canadian, single–centre experience

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Introduction: We tested known prognostic factors, such as prostate–specific antigen (PSA), alkaline phosphatase levels (ALP), hemoglobin levels (Hb), Eastern Cooperative Oncology Group (ECOG) performance status, and other hematological parameters.

Methods: A total of 68 patients were treated at our centre. The first 24 patients were treated under clinical trials. We tested known prognostic factors from the ALSYMPCA trial,[1] as well as other prognostic factors known to have an influence on metastatic castrate–resistent prostate cancer (mCRPC). PSA, ALP, Hb, and white blood count at baseline before the start of radium–223 were tested for their prognostic value for overall survival (OS) with the Kaplan–Meier method; comparisons were made using the log–rank test.

Results: The median age was 71 years. The median time from diagnosis to the first cycle of radium–223 was 99.5 months (interquartile range [IQR] 52–129) and the median followup was eight months (IQR 3.3–16.8). Overall, 50% of patients completed the planned six cycles, 12% received five cycles, and 16% received only one cycle. At the time of analysis, 60% of patients had died. The number of cycles received was a strongly predictive for OS. While median survival for all patients was 13.6 months, patients who completed all six cycles had a median survival of 18.8 months, and those who completed 1–3 cycles had a median survival of only two months (p=0.001). Patients who had an ECOG of 0–1 received a median of six radium–223 cycles (IQR 3.75–6) compared to those with an ECOG ≥2, who received a median of four cycles (IQR 2–6) (p=0.02). Median OS for patients with baseline ECOG of 0–1 was 16.4 months vs. 9.5 months for ECOG ≥2 (p=0.037). Furthermore, OS for patients with a Hb level >120 g/l (n=35) vs. those with a Hb ≤120 g/l was 18.0 and 8.3 months, respectively (p=0.005) and OS for patients with an ALP >107 U/l vs. ALP <107 U/l was 15.2 and 12.9 months, respectively (p=0.026). Baseline laboratory values were compared to values before the fourth cycle; median increase in PSA was 55%. An increase <55% was associated with a median OS of 20.8 months vs.9.3 months for an increase by >55% (p=0.02). Variations in ALP were not prognostic for OS (p=0.2).

Conclusions: Median survival was 13.6 month in our cohort, a result comparable the ALSYMPCA trial (14.9 months), and less than an open–label, single–arm phase 3b trial (16 months).[2] Patients need to be carefully selected using known prognostic factors for mCRPC, especially ECOG performance status, that can be used to reliably select patients potentially able to complete the recommended six cycles of radium–223.

References:

1. Parker C, Nilsson S, Heinrich D, et al. Alpha emitter radium 223 and survival in metastatic prostate cancer. *N Engl J Med* 2013;369:213–23. https://doi.org/10.1056/NEJMoa1213755
2. Saad F, Carles J, Gillessen S, et al. Radium–223 and concomitant therapies in patients with metastatic castration–resistant prostate cancer: An international, early access, open–label, single–arm, phase 3b trial. *Lancet Oncol* 2016;17:1306–16. https://doi.org/10.1016/S1470–2045(16)30173–5

MP–1.12

Update on the largest Canadian robotic–assisted radical prostatectomy (RARP) experience: Oncological and functional outcomes of 1034 RARP cases with six–year followup

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Introduction: Robotic–assisted radical prostatectomy (RARP) is now the predominant surgical approach to treat localized prostate cancer. However, there is still limited Canadian data on its outcomes. Herein, we update the largest RARP experience in Canada, focusing on oncological and functional outcomes.

Methods: Prospective data from 1034 cases of RARP performed by two staff surgeons (KCZ, AE) at a single academic centre were collected from October 2016 to June 2017. Preoperative characteristics and postoperative surgical, pathological, functional, and oncological outcomes were assessed up to 72 months postoperative.

Results: Median followup (interquartile range) was 30 months (12–48). D'Amico risk distribution was 26.1% low–, 59.8% intermediate–, and 14.1% high–risk. Median operative time was 170 minutes (145–200), blood loss was 200 mL (150–300), and the postoperative hospital stay was one day (1–1). Transfusion rate was only 1.4%. Intraoperative complications rate was 3.8%. There was a total of 32 (3.1%) major postoperative complications (Clavien III–IV) and 138 (13.3%) minor complications (Clavien I–II). A total of 630 patients were staged pT2 (64.2%) with a positive surgical margin (PSM) rate of 15.7% (99). Three hundred forty–nine patients were staged pT3 (35.6%), of which 39.0% (136) had a PSM. One patient was staged pT4 (Table 1; available at https://cua.guide/). Urinary continence (defined as 0 pads/day) returned at three, six, 12, and 24 months for 71.9%, 82.1%, 88.5%, and 91.2% of patients, respectively. Potency rates (defined as successful penetration) were 25.3%, 32.0%, 43.5%, and 50.1% at three, six, 12, and 24 months, respectively. Biochemical recurrence (BCR) occurred in 114 patients (11.0%) and freedom from BCR was significantly associated with D'Amico risk (Fig. 1; available at https://cua.guide/). Forty–six patients (4.4%) had hormonotherapy, while 136 patients (13.2%) were referred for salvage radiotherapy.

Conclusions: This updated study shows comparable results to other high–volume centres. RARP appears to be safe with acceptable surgical, oncological, and functional outcomes.

MP–1.13

Optimization of the ISUP five–tier Gleason grading system in a cohort of localized prostate cancer patients undergoing radical prostatectomy in Quebec, Canada

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Introduction: We compared the ISUP five–tier Gleason Grading Groups (GGG) to the previous scoring system, and postulated further optimization of the GGG system.

Methods: Data were collected prospectively in the PROCURE Biobank, a cohort of prostate cancer (PCa) patients undergoing radical prostatectomy in academic centres in Quebec between 2007 and 2013. Total specimen evaluation was standardized and Gleason scoring was performed by four genitourinary pathologists. Treatment failure was defined as detectable and increasing prostate–specific antigen (PSA) levels or initiation of secondary non–adjuvant therapy. Analyses were conducted using the Kaplan–Meier method, log–rank tests, and the Harrell's concordance index (HCI) for Cox proportional hazards models.

Results: A total of 1857 patients were included; median followup time was five years. Five–year treatment failure rates were 8.4%, 22.3%, 46.0%, 66.7%, and 84.3% for GGG1–5 (Fig. 1; available at https://cua.guide/), respectively. As expected, failure rates were lower in patients with Gleason 3+4 (GGG2) than 4+3 (GGG3) tumours (p<0.001). Primary Gleason pattern (4 or 5) was also relevant in GGG5 (Gleason 9/10, five–year failure rates 81.9 vs. 96.8%; p=0.010) (Fig. 2; available at https://cua.guide/). Patients in GGG2 with a tertiary Gleason 5 pattern had higher treatment failure rates than other GGG2 patients (p<0.001), but similar rates com-

pared to patients in GGG3 without tertiary pattern (p=0.634). The same observation was made for patients in GGG3 (p=0.020 and p=0.930, respectively) (Fig. 3; available at https://cua.guide/). The accuracy of Gleason scoring improved with the new GGG (HCI 0.746 vs. 0.694), but was further improved when upgrading patients in GGG2/3 with a tertiary Gleason 5 pattern to GGG3/4 (HCI 0.753), and by dividing GGG5 patients based on their primary Gleason pattern (HCI 0.754) (Table 1; available at https://cua.guide/).
Conclusions: The five–tier GGG system improved the accuracy for predicting treatment failure in our cohort of localized PCa patients. It may be further optimized by dividing GGG5 based on primary Gleason pattern, and by upgrading GGG2–3 tumours with a tertiary Gleason 5 pattern.

MP–1.14
Variation in the predictive and clinical utility of urinary biomarkers, PCA3 and T2ERG, in a large, multicentre study
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Study Groups: Early Detection Research Network.
Introduction: In men with prostate–specific antigen (PSA) <4 ng/mL and men less than 55 years of age, the value of prostate cancer screening strategies are unclear. It is unknown whether urinary biomarkers for prostate cancer (PCa) have added predictive and clinical utility to clinical risk calculators in these men. We sought to examine the added predictive and clinical utility to clinical risk calculators for urinary biomarkers in prediction of PCa in younger men and men with lower PSA values.
Methods: Demographics, Prostate Cancer Prevention Trial (PCPT) v2.0 risk scores, biomarker data (PCA3 and T2ERG), and biopsy pathology features were prospectively collected from 718 men as part of the Early Detection Research Network (EDRN). Predictive utility was determined by generation of receiver operating curves and comparison of area under the curve (AUC) values for the baseline multivariable PCPT model and for models containing biomarker scores. Clinical utility was determined by decision curve analysis across multiple clinical thresholds for the various models.
Results: PCA3 and T2ERG added predictive utility for prediction of PCa when combined with the PCPT risk calculator (Table 1, Fig. 1; available at https://cua.guide/). This utility was seen in men both less than and above the age of 55 years and men with PSA values below and above 4 ng/mL. PCA3 and T2ERG added clinical utility in men both below and above the age of 55 years and men with PSA values below and above 4 ng/mL across a wide range of thresholds (20–80%) compared to PCPT alone, biopsy all, and biopsy none strategies (Fig. 2; available at https://cua.guide/). Limitations include smaller number of young men (n=143) and men with PSA <4 ng/mL (n=192). The post–hoc and subgroup analysis nature limits findings to being hypothesis generating.
Conclusions: As novel biomarkers are discovered, both predictive and clinical utility should be established across demographically diverse cohorts.

MP–1.15
Psychosocial adaptation to a prostate cancer diagnosis in a cohort of radical prostatectomy patients in Quebec, Canada
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Introduction: Psychosocial adaptation significantly affects the quality of life of cancer patients, but has rarely been studied in men diagnosed with prostate cancer (PCa).
Methods: Data were collected from self–administered questionnaires in the PROCURE Biobank, a prospective cohort of patients with localized PCa who underwent surgery in one of four academic centres in Quebec between 2007 and 2013. Relative risk ratios (RRR) were calculated using multinomial logistic regression.
Results: A total of 93% (1861/2003) of PROCURE patients returned the questionnaire. Median age was 62 years; the majority was white (92.9%) and had a post–secondary education (60.7%). Most patients reported having accepted the diagnosis (89.0%) and were satisfied with the communication of the diagnosis (71.2%). Satisfaction was lower in young patients (RRR 0.82; p=0.009) and patients receiving their diagnosis by telephone (RRR 0.41; p=0.001), but high in patients informed by their family doctor/urologist (83.5%, 76.7%, respectively; p<0.001). Patients satisfied with the communication had a higher acceptance of the diagnosis (RRR 1.3; p=0.005) and less feelings of fear, despair, denial, doubts, revolt, and isolation, and difficulties in performing daily tasks, sleeping and/or concentrating (p<0.05). Most patients (89.2%) preferred to receive information about PCa and its treatment at the time of diagnosis, while only 63.4% said they received such information during this consult. Patients found physical activity (62.3%), breathing exercises (44.5%), music (32.8%), faith (30.3%), and muscle relaxation (30.1%) the five most helpful coping strategies. Music and faith were more helpful for ethnic minorities, support groups and psychological help for younger, highly educated patients.
Conclusions: This study stresses the importance of urologists/family doctors communicating a PCa diagnosis directly to their patients. Patients may benefit from individually tailored interventions to facilitate their overall coping.

UP–1.1
Pre–procedural rectal screening for ciprofloxacin–resistant organisms reduces rates of febrile urinary tract infection post–transrectal ultrasound–guided prostate biopsy
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Introduction: Fluoroquinolones like ciprofloxacin are commonly given prophylactically to patients undergoing transrectal ultrasound–guided (TRUS) prostate biopsies. However, the rise of ciprofloxacin–resistant bacteria has also caused the rise of post–biopsy febrile urinary tract infections (UTI).[1] These infections are associated with morbidity, mortality, and significant monetary costs.[2–4] We believe that screening for carriage of ciprofloxacin–resistant organisms with rectal swabs pre–biopsy will significantly reduce the incidence of post–biopsy febrile UTI.
Methods: From 2012–2015, we compared the infection rates and demographic data of 593 prospectively swabbed TRUS biopsy patients to a retrospective cohort of 967 non–swabbed TRUS biopsy patients. The primary outcome was the rate of febrile UTI in both groups. The prevalence of ciprofloxacin–resistant enteric organisms amongst swabbed patients and risk factors for carriage of these organisms were also determined. Data was prospectively gathered via questionnaire prior to the biopsy.

Results: There were no cases of febrile UTI in the swabbed cohort, compared to a rate of 1.7% (n=17) in the non–swabbed cohort. Thus, those who were screened prior to their biopsy had a 100% risk reduction compared to those who weren't screened ($p<0.05$). Ciprofloxacin resistance was found in 21.4% of patients swabbed. Of the risk factors analyzed to determine the likelihood of ciprofloxacin resistance, only previous antibiotic use was a significant predictor ($p<0.03$), although recent travel outside of North America trended towards significance ($p=0.07$). Logistic regression modelling also showed that the likelihood of ciprofloxacin resistance increased with increased antibiotic exposure.
Conclusions: Screening with rectal swabs can significantly decrease the incidence of post–biopsy febrile UTI. Furthermore, patients who have had prior antibiotic exposure would especially benefit from rectal culture–based prophylaxis.
References:

1. Fasugba O, Gardner A, Mitchell BG, et al. Ciprofloxacin resistance in community–and hospital–acquired Escherichia coli urinary tract infections: A systematic review and meta–analysis of observational studies. *BMC Infect Dis* 2015;15: 545. https://doi.org/10.1186/s12879–015–1282–4
2. Williamson DA, Barrett L, Rogers BA, et al. Infectious complications following transrectal ultrasound–guided prostate biopsy: New challenges in the era of multidrug–resistant *Escherichia coli*. *Clin Infect Dis* 2013;57:267–74. https://doi.org/10.1093/cid/cit193
3. Roth H, Millar JL, Cheng AC, et al. The state of TRUS biopsy sepsis: Readmissions to Victorian hospitals with TRUS biopsy–related infection over 5 years. *BJU Int* 2015;116:49–53. https://doi.org/10.1111/bju.13209
4. Taylor AK, Zembower TR, Nadler RB, et al. Targeted antimicrobial prophylaxis using rectal swab cultures in men undergoing transrectal ultrasound–guided prostate biopsy is associated with reduced incidence of postoperative infectious complications and cost of care. *J Urol* 2012;187:1275–9. https://doi.org/10.1016/j.juro.2011.11.115

UP–1.2

Decision aids for prostate cancer screening: A systematic review and meta–analysis

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Study Groups: Clinical Urology and Epidemiology (CLUE) Working Group.

Introduction: Prostate cancer screening is preference–sensitive. Decision aids are intended to facilitate shared decision–making. We conducted a systematic review and meta–analysis of randomized controlled trials (RCTs) that addressed the impact of decision aids on decisional outcomes and screening decisions.
Methods: We searched MEDLINE, EMBASE, PsycINFO, CINAHL, and Cochrane CENTRAL up to June 2017. We performed screening, data extraction, assessment of risk of bias using a modified Cochrane tool, and quality of decision aids using IPDAS instrument in duplicate. We abstracted knowledge about prostate cancer screening, discussion during clinical encounter, decisional conflict, and screening decision. We analyzed effects using the DerSimonian–Laird's random effects inverse variance method for continuous outcomes, and for dichotomous outcomes using the Cochran–Mantel–Haenszel method.
Results: Of 7825 reports, 19 RCTs proved eligible (n=9315 randomized). In all studies, allocation sequence was adequately generated; in nine (47%), allocation was adequately concealed and in eight (42%), data collectors were blinded. We were able to evaluate 12 decision aids: they all reported the aim, all but one reported the impact of screening on mortality, all but two reported screening harms screening; however, only four reported the likelihood of a true negative results, and three reported those of false negative results, or next steps for a negative result. None were designed to facilitate shared decision–making between patients and physicians. In the pooled analyses (Figs. 1–4), decision aids moderately increased short–term but not long–term knowledge, and demonstrated a small decrease in decisional conflict. Decision aids had no effect on screening discussion and possibly no effect on decision to undergo screening.
Conclusions: Moderate quality evidence suggests modest impacts of decision aids. Work in this area would benefit from decision aids that promote shared decision–making in the patient–physician encounter.

UP–1.3

Transperineal prostate biopsies under local anesthetic: Experience with 507 patients

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Introduction: Prostate cancer has been typically diagnosed via a transrectal ultrasound–guided approach (TRUSBx); however, the risk of urosepsis has been estimated to be between 5–7%, with hospital admission rates ranging from 2–4%.[1] Transperineal prostate biopsies (TPBx) have yielded a significantly lower urosepsis rate compared to TRUSBx; however, most series of TPBx described in the literature typically involve a general/spinal anesthetic, which is a barrier to the uptake of this technique by community urologists. We report on our results, experience, and patient tolerability in 507 patients who underwent a TPBx under local anesthetic beginning in October 2016.
Methods: The NYGH REB reviewed and approved this study. A retrospective chart review was conducted on consecutive patients who underwent TPBx at NYGH from October 12, 2016 to August 31, 2017.
Results: A total of 507 patients underwent a TPBx under local anesthetic. Two patients were excluded from the study because of positional limitations. Median age was 65 years and median prostate–specific antigen (PSA) was 7.1. Two hundred forty–eight patients had a positive pathology for a cancer detection rate of 48.9%. Nine patients developed acute urinary retention (1.8%). One patient was admitted with multiple comorbidities for profound hypotension, but his blood and urine cultures were negative. There were no emergency room visits for urosepsis. Patient tolerability was assessed in our last 62 patients with VAS scores of 2.5 for ultrasound probe insertion, 3.3 for local skin infiltration, 3.0 for peri–prostatic local infiltration, and 2.4 for the actual biopsy. The clinical patient characteristics, pathological results, and pain scores are listed in Tables 1, 2, and 3 (available at https://cua.guide/).
Conclusions: TPBx under local anesthetic is feasible to integrate into a busy urology practice with a fast learning curve. It has a good cancer detection rate and is well–tolerated by patients. Most importantly, a significant number of urosepsis admissions secondary to TRUSBx can be prevented with adoption of the TPBx technique.
Reference:

1. Liss MA, Ehdaie B, Loeb S, et al: An update of the American Urological Association white paper on the prevention and treatment of the more common complications related to prostate biopsy. *J Urol* 2017; 198:329–34. https://doi.org/10.1016/j.juro.2017.01.103

UP–1.4

Disparity in public funding of therapies for metastatic castrate–resistant prostate cancer across Canadian provinces

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Introduction: Treatment using abiraterone acetate, enzalutamide, cabazitaxel, and radium–223 (Ra–223) improve overall survival and quality of life for patients with metastatic castrate–resistant prostate cancer (mCRPC). However, despite their proven benefits, access to these therapies is not equal across Canada.

Methods: We describe provincial differences in access to approved mCRPC therapies. Data sources include the pan–Canadian Oncology Drug Review database, provincial cancer care resources, and correspondence with pharmaceutical companies.

Results: Both androgen receptor–axis–targeted therapies (ARATs) abiraterone acetate plus prednisone, and enzalutamide are funded by provinces in both the pre–and post–chemotherapy setting, however, sequential ARAT use is not allowed. 'Sandwich' therapy, where one ARAT is used pre–chemotherapy and a second is used upon progression on chemotherapy is funded in Ontario (ON), Alberta, New Brunswick, Prince Edward Island (PEI), and Newfoundland & Labrador. Ra–223 is funded in ON, Quebec (QC), British Columbia (BC), Saskatchewan, and Manitoba to varying degrees: ON allows Ra–223 either pre– or post–chemo (not both); QC allows Ra–223 post–chemo unless chemo is not tolerated; BC allows Ra–223 if other life–prolonging mCRPC therapies have been received or ineligible. Cabazitaxel is funded in all provinces post–docetaxel, except QC and PEI. Cabazitaxel is not funded as first–line treatment for mCPRC, after progression on an ARAT in the post–chemo setting, or in combination with agents.

Conclusions: While all provinces have access to docetaxel and ARATs, sandwiching sequential ARATs with docetaxel is funded in select provinces. Ra–223 and cabazitaxel access is not ubiquitous across Canada. Such inequalities in access to life–prolonging therapies could lead to disparities in survival and quality of life among patients with mCRPC. Further research should quantify inter–provincial variation in outcomes and cost that may result from variable access.

UP–1.5

What patient factors predict prostate–specific antigen testing among men aged 50 and above?

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Introduction: Prostate–specific antigen (PSA) screening for early detection of prostate cancer (PCa) is a controversial issue, especially since the U.S. Preventive Services Task Force (USPSTF) recommendation against screening (2012). We analyzed which patient factors predicted PSA screening receipt and physician–patient shared decision–making.

Methods: This was a cross–sectional study, using the Health Information National Trends Survey (HINTS, 4th Ed.), a population–based survey of people living in the U.S. from 2011–2014. Eligible individuals were men aged 50 and above. Two specific questions were analyzed: whether the patient has ever had a PSA test and if any doctor has discussed this test with him.

Results: A total of 3214 men aged 50 and above were included in this study. Mean age was 65±9.8 years; 68% were white, 63.7% were living with a spouse, and 86.8% were born in the U.S. Figs. 1 and 2 demonstrate the percentage of men having a PSA test and having a discussion with their physician regarding PSA testing, respectively. Table 1 (available at https://cua.guide/) presents the multivariable logistic regression analyses predicting which patients underwent a PSA test and which patients had a PSA discussion with their physician. These analyses show that age, education, income, living with a spouse, and past military service significantly predict PSA discussion and PSA testing. Being born in the U.S. and Hispanic race also predict PSA discussion.

Conclusions: Older, more educated men with higher income, with a history of military service, and who live with a spouse were more likely to undergo PSA testing. Furthermore, these factors, in addition to Hispanic race and being U.S.–born, were associated with having a discussion with a physician about PSA testing. Despite the USPSTF recommendations and international guidelines, this study demonstrates that specific patient characteristics impact whether patients are screened for PCa in the real world. Importantly, known risk factors, such as obesity and black race, do not seem to influence the results.

UP–1.6

Mean of maximum standardized uptake value from positron emission tomography imaging: A possible predictive parameter for locally advanced prostate cancer

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Study Groups: Canadian Institutes of Health Research (CIHR), Ontario Institute for Cancer Research, Smarter Imaging Program – Prostate (OICR).

Introduction: We acquired imaging data for men with prostate cancer using molecular agents [18F]–DCFpyl (targeted against prostate–specific membrane antigen [PSMA]) and [18F]–flurocholine ([18F]–FCH). Mean standardized uptake value (SUV max) was calculated for each case. In addition to tumour location and extent information, we investigated the mean SUV max as a possible predictive marker for locally advanced prostate cancer.

Methods: We examined 23 patients who had [18F]–FCH and 16 patients who received [18F]–DCFpyl positron emission tomography (PET) imaging pre–prostatectomy (see figure for example of PET imaging in T2 and T3 patients using both tracers). Mean SUV max was calculated for each case. We examined the association of mean SUV max values with pre–biopsy PSA and final pathological staging, as well as tumour percentage in the final prostatectomy specimens.

Results: There were 23 patients in the [18F]–FCH cohort; mean pre–biopsy prostate–specific antogen (PSA) was 5.9 (standard deviation [SD] 0.7). Almost half (47.8%) had pT3, and 52.2% had pT2 on final pathology. Mean SUV max in patients with pT3 group (5.52, SD 0.7) was higher than in patients with pT2 with mean SUV max 3.24 (SD 0.35) (p=0.12). Higher tumour percentages were not associated with mean SUV max values in this group. Mean PSA among patients with pT3 disease was 7.42 (SD 1.1) vs. 4.3 (SD 0.73) among patients with pT2 disease in this group (p=0.018). There were 16 patients in the [18F]–DCFpyl cohort; mean pre–biopsy PSA was 8.9 (SD 1.57). pT3 disease was present in 37.5% and 62.5% had pT2 disease. Mean SUV max in patients with pT3 (12.53, SD 5.55) was higher than in patients with pT2 (2.62, SD 0.52) (p=0.038). Higher tumour percentages were not associated with mean SUV max values. Mean PSA among patients with pT3 disease was 14.5

(SD 2.73) vs. a mean PSA value of 5.49 (SD 0.76) among patients with T2 disease in this group (p=0.0013).
Conclusions: Higher pathological staging showed univariable association with higher mean SUV max values. A larger sample size is needed to determine if PET SUV is an independent marker for higher–risk prostate cancer in comparison to other biomarkers, such as PSA and biopsy Gleason grade.

UP–1.7
Evolution of positive surgical margins in robotic prostatectomy: Is there a plateau for proficiency?

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Introduction: Robot–assisted radical prostatectomy (RARP) has continued to gain ground over the open approach for the treatment of localized prostate cancer. Surgical experience is an important factor determining oncological outcomes in RARP, notably positive surgical margins (PSM). We sought to assess if prior RARP experience correlated with PSM, and to determine if there was any plateau in surgeon performance.
Methods: We analyzed prospective data from 1034 RARP cases done by two surgeons (KCZ, AE) between March 2006 and April 2017. Incidence of PSM was studied over the number of cases performed. Logistic regressions were used to detect improvement in overall and apical PSM, both for individual and combined surgeons, controlling for factors such as patient age, prostate–specific antigen (PSA), Gleason score, and transrectal ultrasound (TRUS) prostate size.
Results: Analysis of PSM over Surgeon 1's 620 cases showed no significant reduction in PSM or learning curve for this surgeon who had performed about 1200 RARPs prior to entering our database. Surgeon 2, who had less initial experience, had significant reduction all across his 414 cases in both overall and apical margins. When measuring progression for every 20 cases completed by Surgeon 2, odds ratios for overall and apical PSM were 0.91 (95% confidence interval [CI] 0.87–0.95) and 0.88 (95%CI 0.83–0.94), respectively (p<0.001). Subanalysis of pT2 disease also revealed significant improvement over individual cases for Surgeon 2 (p<0.05), but significance was lost for pT3 disease.
Conclusions: Our analyses did not reveal a significant effect of additional cases performed by the surgeon with more prior cases, suggesting a plateau in the likelihood of PSM with experience. The less experienced surgeon showed significant improvement in PSM over 414 cases, highlighting the learning curve present in early RARP experience. Furthermore, improvements in the occurrence of PSM were significant for pT2, but not pT3 disease, which seems to mirror the learning curve in traditional open prostatectomy.

UP–1.8
Do diabetes and metformin have an impact on prostate cancer prognosis after radiotherapy? Results of a large institutional database

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Introduction: We investigated the importance of metformin in patients treated with radiotherapy in a large institutionalized database.
Methods: We identified all patients from our database that were treated for primary localized prostate cancer with either prostate brachytherapy or external–beam radiotherapy ± androgen–deprivation therapy. Comparison between groups was done using Kaplan–Meier analyses and Cox regression models. Adjustments on multivariate analysis were made for CAPRA score, type of treatment, and age.
Results: We identified 2441 patients with complete data on cancer aggressiveness and sufficient followup. A total of 381 (16%) patients were diabetic; 281 patients were treated with metformin ± other anti–diabetic medication and 101 patients were treated with other antidiabetic medication, excluding metformin. Median followup was 48 months (interquartile range [IQR] 24–84); 218 patients (9%) died and 150 (6%) experienced biochemcal recurrence (BCR). Median (IQR) followup to recurrence was 52 months (27–69) and to death 52 months (24–78). Taking metformin had a protective effect in showing less BCR on univariate analysis only and on multivariate analysis in better overall sirvival (OS) than in diabetics not taking metformin. More specifically, on univariate analysis for BCR–free survival, metformin showed les BCR compared to non–metformin takers (p=0.04). But this effect was not present anymore on multivariate analysis (hazard ratio [HR] 0.75; 95% confidence interval [CI] 0.27–2.04; p=0.6). When analyzing the effect of diabetes and metformin on OS on multivariate analysis, diabetics had worse OS than non–diabetics (HR 1.5; 1.08–2.06; p=0.01), but when diabetics took metformin, they fared better than diabetics not taking metformin (HR 0.5; 0.26–0.86; p=0.01). Taking metformin resulted in similar OS as in non–diabetics (HR1.13; 0.73–1.73; p=0.6).
Conclusions: We found that the effect of diabetes and metformin is inconsistent and must, therefore, depend on many different variables, which are so far unknown.

UP–1.9
Combination of PUMA and NOXA expression in benign epithelial cells in prostate cancer is predictive of biochemical recurrence in patients

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Study Groups: Molecular Pathology Platform at CRCHUM.
Introduction: PUMA and NOXA are two pro–apoptotic members of the BH3–only subgroup of the BCL–2 family. These two proteins play a role in the initiation of apoptosis. The objective of this study is to analyze their expression by immunofluorescence in benign and tumour prostate tissues to determine if there is a correlation between their expression and patient biochemical recurrence (BCR).
Methods: Biomarker antibodies were verified for specificity and optimized by Western blot and with tissue microarrays (TMA) containing prostate cancer cell lines and cell line–derived xenograft tissues. Subsequently, quantification of expression for both biomarkers was performed on six TMA generated from radical prostatectomy samples (285 patients). The TMA were constructed using two cores of benign adjacent to the tumour and two cores of tumour tissue from each patient. Analysis of biomarker expression was semi–automated using the VisiomorphDP software. Correlation with patient clinical outcome was determined with SPSS V20 software.
Results: There was no correlation of PUMA and NOXA expression and BCR in tumour cores and stroma. In contrast, in benign epithelial cells, Kaplan–Meier analysis showed a significant association between an extreme (low or high) PUMA expression and BCR (log rank=11.349; p=0.001). Further analysis revealed a significant association between high NOXA expression in benign epithelial cells and BCR (log rank=6.133; p=0.013). The combination of extreme PUMA and high NOXA identified patients with a poor prognosis (log rank=16.041; p=0.000). In a multivariate Cox regression model, PUMA and NOXA proteins were also identified as independent predictive biomarkers of BCR.
Conclusions: By studying benign tissue adjacent to the tumour, we identified two potential biomarkers that discriminate high–risk patients, independent of Gleason score or pathological stage. We will next evaluate PUMA and NOXA expression in benign cells in relation to the distance from the tumoural site.

UP–1.10

4Kscore and PCA3 tests concordance in predicting positive biopsy for clinically significant prostate cancer

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Introduction: Prostate–specific antigen (PSA) is widely used for prostate cancer (PCa) diagnosis and management. It has a relatively poor specificity in detecting clinically significant PCa, especially when PSA is between 2.5 and 10. To avoid unnecessary biopsy, new tests such as the 4Kscore (4K) and PCA3 tests have been proposed as novel biomarkers for clinical significant PCa detection. We aimed to: 1) assess the concordance rate of these biomarkers in predicting clinical significance PCa; and 2) evaluate which test has better accuracy and, hence, more reliable in guiding decisions when they are not in concordance.

Methods: A retrospective study of patients who had both tests performed at our institution, from August 1, 2016 to August 1, 2017 was performed. PCA3 of <35 and 4Kscore of <7.5% were considered negative results. We assessed the diagnostic performance of these biomarkers when they were in concordance (high–risk group: double positive or low–risk group: double negative); and when they were not in concordance (Group 1: PCA3–positive, 4K–negative; Group 2: PCA3–negative, 4K–positive).

Results: A total of 52 patients had both tests performed; 31 patients had a PCA3 threshold of <35 (negative), and 18 patients had a 4Kscore of <7.5% (negative). Thirty patients' (57.7%) test results were in concordance; of these,12 men were in the low–risk group (double negative), and 16 men were in high–risk group (double positive). All patients in the low–risk group who had biopsy were negative for significance disease. Seven of 11 men (63.6%) in the high–risk group who had biopsy were found to have significance disease (one Gleason 4+4, five Gleason 3+4, one Gleason 3+3 based on Epstein criteria). Twenty–two patients' (42.3%) test results were non–concordance. Five men were in Group 1, where PCA3 was positive and 4K was negative, and 100% of them had a negative biopsy when performed. Seventeen men were in Group 2, where PCA3 was negative and 4K was positive; 37.5% (3/8) were found to have clinically significant PCa (one Gleason 4+5, two Gleason 3+4).

Conclusions: This study showed that a significant number of patients (42.3%) had non–concordance results when both PCA3 and 4K were performed. When not in concordance, the PCA3 test seemed to have a higher rate of false positive result, whereas when the 4K test was positive, it had a positive predictive value of 37.5% for clinically significance PCa. Therefore, when the results are not in concordance, the 4K test should have more weight in the clinical decisions.

UP–1.11

Magnetic resonance imaging fused cone beam computed tomography–guided biopsy of prostate: Early experience of novel biopsy method

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Introduction: Real–time 3D fluoroscopy guidance using a computed tomography (CT) fused to a magnetic resonance imaging (MRI) can project an MRI–detected lesion onto the screen of a cone beam CT scan. This allows an operator to advance a needle directly into the software–generated lesion using real–time fluoroscopy to confirm biopsy needle placement within the lesion. To date, there have been limited reports on the use of this new technology for prostate biopsies. We prospectively assessed the safety and feasibility of MRI fused cone beam CT–guided prostate biopsies.

Methods: We retrospectively identified 45 patients who had either negative transrectal ultrasound–guided prostate biopsy (TRUSP) or TRUSP biopsies showing small–volume Gleason 6 disease with a clinical suspicion of higher–volume, higher–grade disease. All patients had an MRI showing a Prostate Imaging Reporting and Data System (PIRADS) category 4 or 5 lesion within the prostate. Patients underwent site–directed MRI fused CT–guided biopsies through a transgluteal approach. Biopsy results and immediate and 30–day complication rates were recorded.

Results: The biopsies were well–tolerated by all patients. No patient experienced an immediate or 30–day complication. Of the 45 patients, 28 had previous negative biopsies and 17 had biopsies harbouring low–volume Gleason 6 disease. Of the 28 patients with previous negative biopsies, 13 patients had positive CT–guided biopsies revealing Gleason 6 disease in four patients and Gleason ≥7 in nine patients. Of the 17 patients with low–volume Gleason 6 disease, 10 patients had CT–guided biopsies showing prostate cancer; seven patients with Gleason 6 disease and three patients with Gleason ≥7 prostate cancer. In patients with PIRADS 5 lesions, we detected cancer in 68% (13/19) of which, four had Gleason 6 disease and nine had Gleason ≥7 disease.

Conclusions: MRI fused cone beam CT–guided biopsy of the prostate appears to be technically feasible with a reasonable safety profile. Additional experience will be required to further delineate the safety and diagnostic accuracy of this novel method of prostate biopsy.

UP–1.12

Salvage high–intensity focused ultrasound for recurrent localized radiorecurrent prostate cancer: Intermediate–term results from a large, single–centre cohort

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Introduction: Biochemical failure (BF) following radiotherapy (RT) for localized prostate cancer (PCa) can be due to localized recurrence alone. Prostate salvage high–intensity focused ultrasound (sHIFU) ablation may be potentially curative for these men. We present intermediate–term followup of a large cohort from a single centre.

Methods: Between April 2006 and March 2017, 87 men with biopsy–proven locally recurrent PCa underwent whole gland sHIFU using the Sonablate 400 device. Data on oncological control, adverse effects, and quality of life were collected prospectively. Mean age was 70 years at salvage. Seventy–three men had prior external beam RT and 13 had low dose rate brachytherapy. Median pre–salvage prostate–specific antigen (PSA) was 3.77 ng/ml (interquartile range [IQR] 2.72) and prostate volume 23.2 ml (IQR 9.2). Baseline biopsy (bx) showed International Society of Urological Pathology (ISUP) grades 1–5 in 13, 20, 14, 14, and five men, respectively, while Gleason grade could not be determined in the other 21 bx. Nineteen had received androgen–deprivation therapy (ADT) prior to salvage treatment. Kaplan–Meier method and binomial logistic regression analysis on IBM SPSS version 23 were used for analysis.

Results: Median followup was 50.2 months. Six–month bx was positive for PCa in 21/65 men (32%). Eight–year rates of biochemical recurrence–free survival (BRFS), freedom from ADT, overall survival, and disease–specific survival (DSS) were 16.7±6.4%, 68.0±7.7%, 79.3±5.1%, and 88.9±4.5%, respectively (Fig. 1; available at https://cua.guide/). Binary logistic regression analysis did not reveal factors significantly predictive for BF. Only five men had no treatment–related adverse event (AE), however, the majority (83%) were Clavien 1 or 2 (9%). Two patients (2%) had Clavien 3, both being rectourethral fistulae. At six months, IPSS increased a median of three points, International Index of Erectile Function (IIEF–5) scores dropped 8.5 points among previously potent men, but Short–form 36 (SF 36) scores were unchanged.

Conclusions: sHIFU is a safe and viable option for localized radiorecurrent PCa in carefully selected men, with meaningful freedom from or deference of ADT use and good DSS.

UP–1.13

Impact of autophagy in development of prostate cancer resistance

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Introduction: Patients with metastatic prostate cancer (PCa) have improved outcome when treated with chemotherapy, but over time, develop chemoresistance and succumb to the disease. Recently, it has been shown that chemotherapeutic agents can induce the activation of autophagy promoting resistance, although this has yet to be studied in PCa. Here, we characterize autophagy in several PCa cell lines exposed to chemotherapeutics used in the clinic.

Methods: Levels of autophagy were measured by PCR and Western blot analysis in four PCa cell lines (LNCaP, 22Rv1, PC3 and DU145) both before and after exposure to either docetaxel or cabazitaxel. Next, we established stable LC3 double tagged (mCherrry–GFP) lines and observed the dynamic of autophagic flux using confocal microscopy and flow cytometry. Finally, we determined the effect of autophagy inhibition, using siRNA against Atg7, on the proliferation and survival of PCa cell lines exposed to docetaxel.

Results: We observed varying basal levels of autophagy in the four PCa cell lines, with hormono–sensitive cells (LNCaP, 22Rv1) demonstrating a lower intrinsic autophagy as compared to hormono–resistant lines (PC3, DU145). Analyses of double–tagged LC3 cells showed that docetaxel increases the autophagic flux in all cell lines, although this is greatest in the hormono–sensitive cells. An inhibition of autophagy reduces the proliferation and survival of all PCa cell lines after treatment with docetaxel.

Conclusions: These results suggest that hormone sensitivity of cell lines appears to correlate with the basal level of autophagy. We confirm that autophagy levels are increased following exposure to chemotherapeutic agents. A strategy that combines agents inhibiting autophagy with chemotherapeutics may further improve outcome of patients with PCa.

Poster Session 2: Education/Practice Management
June 25, 2018; 0800–0930

MP–2.1
Development and validation of a 3D–printed bladder model to simulate the laparoscopic urethrovesical anastomosis for radical prostatectomy training

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Introduction: The laparoscopic approach of performing a radical prostatectomy (RP) is associated with a steep learning curve, especially during the urethrovesical anastomosis (UVA). In an attempt to decrease the learning curve for performing a UVA, we developed a 3D printed bladder model for simulated UVA training. Our objective was to validate this model.

Methods: The final bladder model was produced using a LulzBot® TAZ 6 3D printer. The dimensions mimic the anatomical structures of a human bladder and urethra, and the polymer allows for realistic incising and suture pull–through. Urology residents, fellows, and staff completed a laparoscopic training course during which they performed a simulated UVA on the model. Laparoscopic video trainers were used with the model affixed inside a simulated torso (Fig. 1; available at https://cua.guide/), and each UVA was videotaped for construct validation purposes. Participants completed an exit questionnaire using five–point Likert scales within six domains.

Results: Junior and senior residents, fellows, and staff from seven urology programs completed the course (n=24). Mean age was 29.8 years (±4.6), and 21 were male. For face validity, participants scored the following means (out of 5): 3.6 for anatomical realism; 3.8 for overall task–based usefulness; 4.1 for the UVA task itself; and 4.4 for suturing, knot tying, and cutting. For content validity, participants rated overall usefulness as a training tool 4.3 and improving operative technique 4.4. Overall reaction scored a mean of 4.2 over the six domains. A mean of 4.1 was scored for transferability of skills to the operating room, and a mean of 4.3 was indicated for "the model should be incorporated into urology training curricula."

Conclusions: We established that this low–cost bladder model ($14 CAD/model) has face and content validity for laparoscopic UVA training within this sample, and skills acquired using the model can prepare learners for live laparoscopic UVAs. The videos are currently being evaluated by three expert raters to assess the model's construct validity.

MP–2.2
Development, implementation, and evaluation of a competency–based boot camp for first–year urology residents

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Study Groups: McMaster University Surgical Associates.

Introduction: The integration of competency–based education into surgical residency programs, such as the Competence by Design (CBD) initiative in Canada, presents challenges for curricula design to ensure residents achieve competence as they progress. Surgical boot camps have been used to improve the learning process by orienting and preparing new residents. We developed, implemented, and evaluated an intensive didactic and simulation–focused boot camp for first–year urology residents.

Methods: Six first–year residents from two Canadian centres participated in the two–day boot camp, which included 11 didactic lectures (first–year medical and surgical topics) and simulation sessions that allowed for deliberate practice with feedback. Participants completed an entrance and exit survey and an identical pre– and post–boot camp 31–item multiple–choice questionnaire (MCQ). At the end of Day 2, participants completed a six–station objective structured clinical exam (OSCE) followed by a semi–structured group feedback discussion. Three second–year urology residents served as historical controls and completed the identical MCQ and OSCE.

Results: The six participants had a mean age of 26.8±2 years, three were male, and represented five medical schools. Most prior urology experience was as an observer or second assist. Participants markedly improved on the pre– and post– MCQs (62%±11 and 91%±9, respectively), whereas the historical controls scored 66%±8. Participants scored marginally higher than the controls on four of the six OSCE stations. Post–boot camp, participants reported overall higher confidence levels and felt the curriculum was an excellent preparation for residency.

Conclusions: Our inaugural urology boot camp demonstrated feasibility and utility. The knowledge and technical skills uptake was established via the MCQ and OSCE results, with participants' performance at or even above the level of the second–year resident controls. We aim to further develop our boot camp and provide a framework for other urology residency programs.

MP–2.3
The difficulty of a clinical OSCE start station does not impact final OSCE mark

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Introduction: Examinees in clinical objective structured clinical examinations (OSCEs) may be concerned that the difficulty (or ease) of their start station may undermine (or bolster) their confidence and subsequent performance. We sought to determine if starting at the easiest or most difficult station impacts overall outcome.

Methods: Results of all Canadian PGY–5 candidates writing the Queen's University Examination of Skills Training (QUEST) examination between 2003 and 2013 were queried, and selected stations (the easiest, most difficult, and most difficult manned) were determined for each year. Independent sample t–tests and regression analysis were used to determine if there was a significant difference in final OSCE scores between participants who began on the selected stations vs. the participants who did not.

Results: Three hundred twenty–six residents participated over the study period. Mean station score was 74.3% (standard deviation [SD] 6.0%). There was no significant difference noted in overall final OSCE scores between the participants who began on the easiest (73.7% vs. 74.6%; p=0.524), the most difficult (74.1% vs. 74.3%; p=0.868), or the most difficult manned (73.6% vs. 74.4%; p=0.459) stations and those participants who did not. On regression analysis, the easiest, most difficult, and most difficult manned stations each resulted in non–significant decreases in mean score (–0.9%, –0.3%, and –1.4%, respectively).

Conclusions: The difficulty level of the starting station on an OSCE examination does not appear to benefit, nor harm subsequent overall performance on the examination.

MP–2.4

Development and initial validation of a low–cost ultrasound–compatible suprapubic catheter insertion training simulator

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Introduction: Bedside suprapubic catheterization (SPC) is a fundamental skill required of all urology trainees. Ultrasound guidance during SPC insertion can minimize complications, and its use is recommended in clinical practice guidelines.[1] However, a lack of affordable simulation models and the unpredictability of bedside SPCs make learning this procedure difficult for trainees. We developed and initially validated a low–cost ultrasound–compatible SPC simulation model that allows trainees to safely and deliberately practice the task while acquiring skills that are transferable to bedside SPCs.

Methods: The SPC simulator consists of seven components (Table 1; available at https://cua.guide/). Seven staff urologists and four interventional radiologists conducted a SPC using the model with ultrasound guidance (Figs. 1, 2). To assess for face and content validity, each participant rated the model (using a five–point Likert scale) on three domains: anatomic realism, usefulness as a training tool, and overall reaction.

Results: Participants were in practice for an average of 10 years (range 2–23), and the median number of SPCs performed was 50. For the domains, anatomic realism scored a mean of 4.1 (mean of 4.0 for sonographic realism). Usefulness as a training tool scored a mean of 4.3, and the mean for overall reaction was 4.4. Participants strongly agreed that the model should be incorporated into urology residency (mean 4.4), the skills are transferable to patients (mean 4.3), and its use would improve trainee confidence (mean 4.6). The cost of the model is approximately $48 CAD, and can be used multiple times during one session.

Conclusions: This novel, low–cost, easily reproducible, ultrasound–compatible SPC training simulator received positive evaluations from urologists and interventional radiologists as a useful model for teaching bedside ultrasound–guided SPC insertion. This model will be integrated into our next annual urology boot camp curriculum, which will allow for further evaluation. Additional research is required for construct validation.

Reference:

1. Wessells H, Angermeier KW, Elliott SP, et al. Male urethral stricture: AUA guideline. Linthicum (MD): American Urological Association Education and Research, Inc.; 2016 Apr. 34.

MP–2.5

What family doctors think of you: Use of an eConsult service for physician–generated feedback to urologists

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Introduction: Opportunities for physician feedback are limited, and often focus on standardized performance reviews. These reviews have been shown to have little actual impact on a surgeons practice.[1] There is currently no formalized system for physician–to–physician feedback between primary care physicians (PCP) and urologists. We present a system whereby PCPs are able to provide anonymized feedback to urologists in regard to the quality of their consults and medical advice.

Methods: Urology physician feedback reports completed through the Champlain BASE service from March 2013 to November 2017 were analyzed. The Champlain BASE service is a secure web–based system, where PCPs are able to send eConsults, instead of requesting a formal in–office consultation for a patient. Each anonymized report allowed PCPs to answer five questions regarding how the eConsult affected the medical management of the patient, as well as the educational value of the interaction with the urologist. Feedback was given using either direct response or ranking via a five–point Likert scale.

Results: A total of 411 feedback reports were analyzed. Of these reports, 89% ranked the urologists advice as 4/5 for usefulness to their patient, and 90% ranked the overall usefulness of the eConsult to the PCP as a 4/5. After October 2016, a question regarding educational value was added to the survey and of 115 surveys with this additional question, 86% of PCPs stated that the educational value of the consult was 4/5. Only 2% reflected that there was no use of the eConsult to either the patient or PCP.

Conclusions: We show that programs such as the Champlain BASE eConsult service allow for constant feedback to surgeons in regards to the quality of care as perceived by their PCP counterparts. This allows ongoing professional development for surgeons throughout their career, and an opportunity for reflection on their practice methods.

Reference:

1. Lockyer J, Violato C, Fidler H. Likelihood of change: A study assessing surgeon use of multisource feedback data. *Teach Learn Med* 2003;15:168–74. https://doi.org/10.1207/S15328015TLM1503_04

MP–2.6

Utilization and impact of an ambulatory urology care centre in Saskatchewan

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Introduction: Since 2013, the Urology Centre of Health (UCH) in Saskatoon has provided consolidated ambulatory urological services with the goal of improving the quality and efficiency of care. A program evaluation of the UCH was conducted in the summer of 2017 to evaluate the utilization and impact of the UCH, including any impact on acute urological visits to Saskatoon's emergency departments (ED).

Methods: The logic model for program evaluation was used as a framework to analyze program inputs, processes, outputs, and outcomes. Patient satisfaction (n=106) was assessed via surveys. Patient volume and treatment data was extracted from an electronic health records database and patient wait time data was extracted from electronic medical records.

Results: UCH patient volumes have increased approximately 250% from year one to year four. Approximately 40% of patients treated at the UCH did not reside in the Saskatoon area, consistent with our province–wide coverage. Patient satisfaction with UCH services and UCH staff was outstanding to good in all variables assessed. Patient wait times for consultations for erectile dysfunction and Peyronie's disease (traditionally longest wait time) decreased by 60% and the time from known elevated prostate–specific antigen (PSA) to prostate biopsy result decreased by 62%. Although the overall ED visits for urological diagnoses did not decrease with the UCH's introduction, visits for postoperative complications/pain, renal colic, urinary retention, and hematuria decreased, indicating some offloading of the ED.

Conclusions: Patient volumes and services have greatly expanded with the opening of the UCH. Patients report a high level of satisfaction with UCH services and staff with shorter wait times. The UCH is offloading ED volumes for certain urological conditions, which is likely a more efficient, cost–effective delivery of specialized patient care. The UCH has developed into a highly functional microsystem within the larger healthcare system .

MP–2.7

Resident–run urology clinics: A potential tool for use in competency–based medical education for teaching and assessing transition–to–practice skills

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Introduction: In a competency–based approach to resident education, a component of training should focus on skills needed for the transition from residency to independent practice. The ability to run an outpatient clinic represents one such skill. Resident–run clinics (RRCs) have been implemented in family medicine programs to allow residents to practice this skill, and have enhanced learning while providing excellent patient satisfaction.[1–5] To date, there has been little experience with RRCs in surgical residency programs. We describe a uology RRC and report assessments of both resident performance and patient satisfaction.

Methods: The RRC is attended and run independently by a senior resident. All cases were reviewed with faculty at the end of the day, and an evaluation form assessing resident performance was completed. Residents completed a brief self–assessment. All patients completed an anonymous survey to assess aspects of patient satisfaction.
Results: Overall, resident performance was excellent, with changes to the management plan in 6% (2/32) of cases after faculty review. All clinics finished within 30 minutes of planned end time. Residents reported confidence in their ability to manage the clinic (8.25/10). Eighteen patient surveys were completed. On a five–point scale, patient ratings of wait time, clinic environment, and appointment duration were 3.94, 4.41, and 4.24 respectively. Patient ratings of residents' skills (communication, sensitivity, treatment options, and answering questions) were 4.28, 4.18, 4.24, and 4.41, respectively. Overall confidence in residents was 8.83/10 (standard deviation 1.69) and 100% of patients would recommend the RRC.
Conclusions: Based on our ongoing experience, RRCs provide well–received, safe patient care and serve as a learning tool for residents as they prepare for independent practice. Given these results, residency programs could consider inclusion of a RRC as a component of the transition–to–practice training within a competency–based curriculum.
References:

1. Serwint JR, Thoma KA, Dabrow SM, et al. Comparing patients seen in pediatric resident continuity clinics and national ambulatory medical care survey practices: A study from the continuity research network. *Pediatrics* 2006;118:e849–58. https://doi.org/10.1542/peds.2006–0422
2. Smith SD, Marrone L, Gomez A, et al. Clinical outcomes of diabetic patients at a student–run free clinic project. *Fam Med* 2014;46:198–203.
3. Yancy WS, Macpherson DS, Hanusa BH, et al. Patient satisfaction in resident and attending ambulatory care clinics. *J Gen Intern Med* 2001;16:755–62. https://doi.org/10.1111/j.1525–1497.2001.91005.x
4. Day KM, Zoog ES, Kluemper CT, et al. Progressive surgical autonomy observed in a hand surgery resident clinic model. *J Surg Educ* 2018;75:450–7. https://doi.org/10.1016/j.jsurg.2017.07.022
5. Weissler JM, Carney MJ, Yan C, et al. The value of a resident aesthetic clinic: A 7–year institutional review and survey of the chief resident experience. *Aesthet Surg J* 2017;37:1188–98. https://doi.org/10.1093/asj/sjx103

MP–2.8

Urologists' attitude toward performance measurement: A Canadian perspective

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Study Groups: Princess Margaret Cancer Centre Foundation.
Introduction: Recent efforts toward surgical quality improvement have been focused on increasing transparency in processes of performance measurement.[1] Publically reported surgeon and hospital outcomes has become a controversial topic.[2] Novel measurements of quality have been proposed, including intraoperative assessment of surgeon technical skill[3] and patient–reported outcomes (PRO).[4]
Methods: A survey questionnaire was created with input from urologists and experts in quality improvement. Consensus was first reached on questions assessing the topics of surgical skill as a quality indicator, best use of operative video for quality improvement, and public reporting of hospital outcomes and audit feedback in surgery. The survey was distributed via email to the Urology Section of the Ontario Medical Association.
Results: Seventy–nine urologists completed the questionnaire (response rate 30.8%), of which 49 (62.0%) were community–based and 48 (60.7%) had more than 10 years in practice. Forty (50.6%) respondents agreed that surgical skill should be included as a quality indicator, but only 23 (29%) felt that operative video analysis should be included in quality improvement databases. Only five (6.3%) respondents agreed that operative video should be made publically available, however, 36 (45%) felt that hospital performance measures should be. Forty–three (54.4%) felt that PRO should be included as quality indicators at a hospital–level and, importantly, 55 (69.6%) agreed that quality indicators should be associated with patient outcomes. Finally, 67 (84.8%) respondents reported concern that measurement of quality indicator data would be used to inform policy without adequate supporting evidence.
Conclusions: Urologists remain skeptical about the measurement and reporting of quality indicators. Growing public demand for increased transparency in surgery may be in opposition of urologists' current views, foreshadowing possible future conflict between quality stakeholders and surgeons.
References:

1. Dimick JB, Greenberg CC. Understanding gaps in surgical quality. *Ann Surg* 2013;257:6–7. https://doi.org/10.1097SLA.0b013e31827ba13d
2. Lindenauer PK, Lagu T, Ross JS, et al. Attitudes of hospital leaders toward publicly reported measures of health care quality. *JAMA Intern Med* 2014;174:1904–11. https://doi.org/10.1001/jamainternmed.2014.5161
3. Goldenberg MG, Grantcharov TP. Video–analysis for the assessment of practical skill. *Tijdschrift voor Urologie* 2016.
4. Smith AB, Schwarze ML. Translating patient–reported outcomes from surgical research to clinical care. *JAMA Surg* 2017;152:811–2. https://doi.org/10.1001/jamasurg.2017.1583

MP–2.9

Attitudes of graduating Canadian urology residents on the job market: Is it getting better or are we just spinning our wheels?

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Introduction: There has been increasing awareness of employment difficulties for physicians, especially surgeons, in Canada over the past few years. Our objective was to elucidate the attitudes and experiences of graduating Canadian urology residents in obtaining employment.
Methods: We surveyed four separate cohorts of graduating urology residents in 2010, 2011, 2016, and 2017. Responses from the 2010 and 2011 cohorts were combined and compared to the combined results of the 2016 and 2017 cohorts. Mean Likert responses were compared using unpaired t–tests. An agreement score was created for those responding with "strongly agree" and "agree" on the Likert scale.
Results: A total of 126 surveys were administered with a 100% response rate. The job market was rated as poor or very poor by 64.9% and 58.4% of graduates in 2010/2011 and 2016/2017, respectively (p=0.67). Lack of resources was identified as the biggest barrier to improved employment in both cohorts. Networking at meetings and staff urologists at their institution were the most important factors aiding employment identified by both cohorts. The ideal practice was academic or academically associated community practices in a large urban area with 5–10 partners for both cohorts.
Conclusions: The majority of graduating urology residents viewed the job market as poor or very poor and this did not change over a six–year period. It is unclear how much personal preference for location and practice type drove the somewhat negative outlook of employment opportunities, as the majority of residents were seeking large urban, academic, or academically associated community practices in competitive locations.

MP–2.10

Canadian interprovincial urological economic disparity

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Introduction: Despite a publicly funded single–payer health system in Canada, there is significant interprovincial economic disparity in remuneration for urological services.

Methods: The Canadian Urological Society (CUA) Health Policy Committee (HPC) created a model to study interprovincial urological economic disparity. A subcommittee was formed with a representative urologist from each province to equate and validate fees. Arbitrarily, British Columbia (BC) was chosen as the base province for comparison among all 10 provinces. BC Medical Services Plan Payment Data Series 2016/17 was used in the analysis. Urologists work fee–for–service and income is determined by the sum of the product of services and fees. The top 20 fee items in BC comprise 84.7% of a BC urologist's income. The total income reported in the model was computed by extrapolation. The model assumes that urologists follow a similar practice pattern across the country, deliver the same number of services, and have a similar proportion of full–time–equivalent (FTE) physicians. Only urologists earning more than the FTE threshold of $84 700 CAD per year, as set–forth by BC government economics, are included. There are 91 FTE urologists in BC. Gross income is calculated in the analysis. Net income is not considered, but would be calculated by subtracting expenses. Interprovincial gross income variance is computed and stratified across the provinces. The fee–value data is accurate as of November 1, 2017.

Results: The economic disparity model yields gross income in Canadian dollars (C$) and variance stratified by province, as shown in Table 1 (available at https://cua.guide/).

Conclusions: Saskatchewan urologists have the highest fees and Ontario the lowest. Despite a mature single–payer healthcare system in Canada, there is significant interprovincial economic disparity in urologist compensation. Annual study is recommended to track changes to interprovincial economic disparity.

MP–2.11

Simulation–based assessments of robotic–assisted technical and non–technical skills in urological education: A systematic review and synthesis of the validity evidence

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Introduction: Robotic–assisted surgery (RAS) has been on the rise in the past decade and has established a significant foothold in urological surgery. Developing expertise in RAS requires mastery of both technical and non–technical skills. However, an evidence–based robotic surgery curriculum is still lacking. To date, the literature has focused on the development of technical skill assessments. Non–technical skills remain understudied, despite being a critical component of the surgical milieu and clinical outcome. The purpose of this review is to present the validity evidence of available simulation–based tools to assess technical and non–technical skills in RAS, and to provide recommendations on how to best implement them in urology training programs.

Methods: A literature search of MEDLINE, EMBASE, and PsycINFO was conducted to identify primary articles using simulation–based assessments of technical and non–technical skills in RAS in urology. Messick's validity framework and the Medical Education Research Study Quality Instrument (MERSQI) were used to structure and evaluate the quality of the evidence of the abstracted articles.

Results: The search identified 556 articles, of which 85 met the inclusion criteria. As shown in Tables 1 and 2 (available at https://cua.guide/), there has been a surge of tools assessing technical and non–technical skills in RAS, ranging from virtual reality–based simulation to live surgery.

Conclusions: As RAS continues to gain popularity as the mainstay method of surgery, there will be an increased need for formalized robotic surgery curricula. Assessments in technical and non–technical skills should be incorporated into all stages of RAS training. Although new simulators and assessment tools show promising results, more validation studies are needed. Future work should focus on developing context–specific assessment tools and establishing benchmarks for achieving competency in technical and non–technical skills.

MP–2.12

Health behaviours among Canadian men are predictors of medical comorbidities: An avenue for intervention

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Introduction: Men's health awareness is an increasingly prevalent issue and can have long–term consequences. The objective of our study was to broadly sample Canadian men to obtain information regarding lifestyle and health behaviours and their impact on medical comorbidities.

Methods: An online survey was sent to Canadian men and included questions regarding demographics, comorbidities, and health behaviours (smoking, alcohol consumption, sleep and exercise behaviours, dietary habits, and depression). Health behaviours were classified as either healthy or unhealthy based on previous studies and questionnaire thresholds. Multivariate regression was performed to determine health behaviours as predictors for medical comorbidities.

Results: After exclusions and sample stratification, 2000 participants were included. Participants were aged 19–94 (median 48, interquartile rnage [IQR] 34–60). Approximately half (47.4%) had poor smoking behaviour, 38.7% unhealthy drinking, 53.9% unhealthy sleeping, 48.9% unhealthy exercise, 61.8% unhealthy eating, and 20.4% classified with depression. On multivariate analysis, poor sleep predicted hypertension (HTN) (odds ratio [OR] 1.43; $p<0.01$); poor drinking behaviour predicted HTN (OR 1.39; $p<0.01$) and protected against type 2 diabetes (DM) (OR 0.61; $p<0.01$); poor eating behaviour protected against cerebrovascular accidents (CVA) (OR 0.34; $p=0.01$); poor exercise predicted HTN (OR 1.29; $p=0.03$); depression predicted HTN (OR 1.61; $p<0.01$), elevated cholesterol (OR 1.61; $p<0.01$), bowel disease (OR 2.44; $p=0.01$), and erectile dysfunction (OR 2.88; $p<0.01$); and smoking behaviour predicted heart disease (OR 2.07; $p<0.01$), elevated cholesterol (OR 1.32; $p=0.03$), DM (OR 1.56; $p=0.02$), CVA (OR 5.16; $p<0.01$), and osteoarthritis (OR 1.41; $p=0.05$).

Conclusions: Our study confirms the association of lifestyle factors and chronic illnesses common to aging males. We emphasize the potential scope of education and awareness campaigns with respect to chronic disease prevention.

MP–2.13

Baseline characteristics of patients initiating mirabegron or antimuscarinic treatment for overactive bladder: Results from the PERSPECTIVE registry

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Study Groups: Jackie van Bueren, Envision Scientific Solutions (medical writing support).

Introduction: PERSPECTIVE is a U.S. and Canadian prospective, observational one–year registry for patients with overactive bladder (OAB) treated with either mirabegron, a β3–adrenoceptor agonist, or an antimuscarinic

(AM). The primary objective is to identify factors associated with improved treatment effectiveness measured by patient–reported outcomes (PROs). In this preliminary analysis, we describe differences between treatment groups in several patient baseline (BL) characteristics, including PROs.
Methods: Patients inluded adults with OAB symptoms ≥3 month initiating a new course of mirabegron or AM in routine clinical practice. PROs were mesured using OAB–q–short form (symptom bother and health–related quality of life [HRQoL] scores) and Patient Perception of Bladder Condition (PPBC) questionnaires, both completed within seven days of enrolment.
Results: Overall, 1514 patients (613 mirabegron, 901 AM) were enrolled; mean age was 62.2 years, 87.2% were white, and 73.5% were women. The proportion of women initiating mirabegron treatment was lower than those initiating AM (69.2 vs. 76.5%). Mirabegron patients, compared with AM patients, had a longer time since diagnosis (49.3 vs. 41.0 months) and were more likely to be diagnosed by a urologist (49.3 vs. 39.1%) than other healthcare professionals. Fewer mirabegron than AM patients had wet OAB (71.1 vs. 79.8%), stress/mixed incontinence (72.0 vs. 85.0%), and were currently using pads (47.1 vs. 55.8%). More mirabegron vs AM patients had received OAB medication in the past 12 months (29.0 vs. 18.8%). BL PRO data within the first seven days were missing for 45–46% of mirabegron and 33% of AM patients. Among those completing BL PROs, mirabegron patients reported lower PPBC scores, indicating fewer problems (36.8 vs. 41.1% reported severe or many severe problems), lower symptom bother score (59.0 vs. 63.0), and higher total HRQoL score (49.7 vs. 43.4) compared with AM patients
Conclusions: Important BL demographic, clinical, and HRQoL differences exist between mirabegron– and AM–treated OAB patients.

MP–2.14

Direct to cystoscopy: A prospective quality assessment of patient preference and current outcomes

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Introduction: Cystourethroscopy is one of the most common procedures performed by urologists in both office and operative settings. With the recent centralization of cystoscopy at our centre, we looked to assess our current delivery model, to determine whether new patients prefer their initial visit to be in cystoscopy, or in the clinic, followed by a cystoscopy appointment later.
Methods: We administered 500 prospective questionnaires to adults undergoing cystoscopy by 14 urologists at our centre. These results were compared to patient demographics and a chart review for indications/disposition related to their cystoscopy. Our primary objective was to assess which patients prefer to be seen directly to cystoscopy (DTC) vs. a clinic appointment (CA) before cystoscopy.
Results: A total of 500 surveys were analyzed, with 333/500 (67%) patients being male. Mean age was 66 years (21–93), with 34% being under 60 years. Thirty–eight percent (n=192) were undergoing their first cystoscopy, with 82% preferring DTC. There was no difference in age, gender, or first–time–cystoscopy when comparing those who preferred DTC to CA. The vast majority (98%) felt they understood their indication for cystoscopy, however, 5% misunderstood why they were being scoped; 84% (n=420) felt their results were adequately disclosed. Clinically significant abnormalities were detected in 22% of patients, who felt their results were not discussed. When asked about abnormal results, only 56% of patients' answers correlated to their urologist's diagnoses. Thirty–seven percent of patients who indicated 'no followup was required,' actually had followup (imaging, office visits, surgery, etc.).
Conclusions: By evaluating patient understanding and preferences surrounding cystoscopy, we have identified many opportunities for improvement. The majority of patients do not take issue with their initial encounter being an invasive procedure, however, communication needs to be addressed. Future efforts will be directed towards post–procedural engagement to improve patient comprehension.

MP–2.15

Evaluation of the leader and communicator CanMEDS roles of graduating Canadian urology residents

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Introduction: The Leader and Communicator roles are two of the seven roles identified by the Royal College as part of the framework of abilities that are essential to graduating fellows. However, aside from the role of medical expert, it is somewhat difficult to formally assess the other CanMEDS roles.
Methods: Chief residents (n=36) were evaluated with two surveys at the time of a weekend course. The response rate was 100%. Both surveys were validated on 5000 business students. One survey evaluates the personal management skills with 84 questions scored on a Likert scale, and the other evaluates the residents' communication skills with 20 questions scored on a Likert scale, as well as some case scenarios evaluating their communication style. The same surveys were administered through email to the residents' program directors (PDs) in a blinded fashion to see if PDs agreed with the residents' self– assessment. The response rate for PDs was 50%
Results: Graduating urology residents tend to score slightly higher (mean score 93.2) on communication skills compared to business students (mean score 90.91). They do, however, score lower on management skills (mean score 385.3 for urology residents vs. 394.55 for business students). There was no difference in the residents' self–assessment of their own communication and management skills and the evaluation of PDs of the their residents' skills.
Conclusions: This objective way of evaluating the Leader and Communicator CanMEDS roles reveals that graduating urology residents score better than business students in communication, but lower in management skills. It would appear that the residents' self–assessments do not differ much from their PDs' evaluation.

UP–2.1

Artificial intelligence in manuscript analysis: Using machine learning to automate the peer–review process

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Introduction: The peer–review process is an integral part of the scientific method, however, with rising numbers of publications, providing quality, timely peer–review has become difficult. There has been limited research into the use of artificial intelligence (AI) to improve this process, and the work that has been done is limited to privately developed systems used by publishers. Using machine learning, we present a system for automated peer–review.
Methods: In partnership with IMSRV Data Labs, urological journal articles were ingested into our AI engine and then broken into component parts and separated by heading, paragraph, sentence, word, and character in a hierarchical model (tokenization) (Fig. 1; available at https://cua.guide/). The tokens were fed to the semantic model and word embeddings (vectors) are created for each tokenized sentence. The sentences are then evaluated against a historical dataset to predict a probability of receiving different classes of peer–reviewed feedback. This allows our AI engine to compare each aspect of a manuscript to the entirety of the scientific communities published data on the subject. We can then predict the probability of acceptance in the journal relying upon several human specified features.
Results: Our prototype AI engine continues development to improve accuracy and feedback. Continuing in the prototype phase, we are able to compare ingested articles against a wide array of previously published urological and other scientific journals to aid in providing a score of originality. Based on this score we aim to estimate chances of acceptance. Ongoing work continues in assessment of different quality indicators of a manuscript, such as scientific method and statistical analysis.

Conclusions: The use of AI has been adopted in many facets of our lives, and peer–review is a logical application of this technology to aid in scientific progress. We present a novel process for development of an AI engine allowing automation of the peer–review process.

UP–2.2
Point–of–care ultrasonography for urologists: A feasibility assessment

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Introduction: Portable ultrasound (US) devices are used by many specialties, but there is a paucity of data regarding bedside US use in the urological setting. Many urological issues are accurately diagnosed using formal US imaging, so it follows that point–of–care US (POCUS) may be a valuable modality. We propose that POCUS is a fast, low–risk, affordable tool that should be added to urologists' armamentarium. An assessment of the feasibility of POCUS for use by urology trainees was conducted at a single centre.

Methods: The Urology Department at our institution purchased two GE VScan with DualProbe POCUS devices. The residents (PGY 1 through 5) underwent a two–hour training session regarding use of the device, conducted by a FRCSC staff radiologist who is cross–appointed to both urology and radiology departments. The trainees used POCUS whenever they thought it appropriate for patient management. Formal imaging or review with a radiologist was always performed following the use of POCUS.

Results: POCUS was used in a variety of settings. Assessment of patients for: hydronephrosis, genital inflammatory conditions, and gross hematuria were performed. POCUS has proven useful for insertion of suprapubic catheters. It has also been useful for trainees to assess for non–urological concerns in their inpatients, such as a pleural effusion and post–surgical hematoma evaluation.

Conclusions: POCUS is a useful tool for urologists in an assortment of settings. The introduction of pocket–sized devices has allowed this tool to be used at the bedside in the evaluation of the urological patient. As its use becomes more widespread, it may save healthcare costs associated with formal diagnostic imaging studies. We propose further research correlating bedside US and formal imaging. As well, we propose that urology residency programs consider including basic US training, as POCUS will no doubt play an increasing role in urologists' initial evaluation of their patients.

Poster Session 3: Male LUTS/Men's Health
June 25, 2018; 0800–0930

MP–3.1
Testosterone therapy prescribing patterns for 39 721 users in British Columbia from 1997–2013

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Introduction: Testosterone therapy (TT) is Health Canada–approved for symptomatic primary or secondary hypogonadism. We analyzed testosterone prescribing patterns as related to actual serum testosterone (T) measurements.
Methods: With UBC Ethics approval, we linked a longitudinally collected British Columbia Ministry of Health diagnostic database (PopDataBC) to both pharmanet and laboratory databases.
Results: We identified 39 721 men prescribed any form of TT between 1997 and 2013. There was a seven–fold increase in the number of annual prescriptions written during the study period. Only 31.0% of first prescriptions were linked to a serum T level drawn in the 365 preceding days and 66.9% of these serum T levels met the biochemical definition of hypogonadism (serum T≤10.4 nmol/L). Of the treated men, only 18.9% had a serum T level drawn in the year after the first prescription. Overall, the largest percentage of prescriptions was written by general practitioners (GPs; 86.1%). In terms of those for whom a pre–TT serum T was drawn, 83.1% were written by GPs, 7.9% by urologists, and 4.6% by endocrinologists. Of those who received a prescription without a serum T drawn, 87.4%, 5.2% and 3.3% were written by GPs, urologists, and internal medicine, respectively. Overall, 26.0% had only one TT prescription filled and remained on treatment for a mean duration of 46.74 days (standard deviation [SD] 37.22); 41.0% received 10 or more prescriptions and remained on TT for a mean duration of 1421.41 days (SD 1053.40).
Conclusions: During the study period, two–thirds of men received a TT prescription without a serum T level being drawn. Less than half of men prescribed TT remained on drug for more than 10 refills. We highlight the need for improved physician education, both during and after medical school, and for research into the compliance of therapy.

MP–3.2
The WATER study clinical results: A phase 3, blinded, randomized trial of aquablation vs. transurethral resection of the prostate with blinded outcome assessment for lower urinary tract symptoms

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Study Groups: WATER 1 Aquablation Study Group.

Introduction: Early reports of robotic aquablation surgery for lower urinary tract symptoms (LUTS due to benign prostatic hyperpalsia (BPH) suggest efficacy similar to that of transurethral resection of the prostate (TURP). We sought to compare the safety and efficacy of prostate ablation using aquablation vs. TURP for 30–80 cc transrectal ultrasound (TRUS)–measured prostates.
Methods: In this international, randomized, blinded, multicentre, phase 3 trial, 275 men with moderate–to–severe LUTS related to BPH were assigned to TURP or aquablation. Six–month outcomes are reported for critical safety and efficacy endpoints.
Results: After exclusion, 181 men were enrolled. Preoperative baseline characteristics were comparable between groups. Mean operative time was equivalent between the two groups, but mean resection time was significantly lower in the aquablation group (4 vs. 27 minutes; p<0.01). At six months, aquablation demonstrated non–inferiority to TURP, with comparable International Prostate Symptom Score (IPSS) (5.9 vs. 6.8; p=0.1). Maximum flow rate (Qmax) and post–void residual (PVR) improvements were also similar (p=NS). Subanalysis of men with 50–80 cc prostate volume, however, did demonstrate superiority with one–, three–, and six–month IPSS improvements favouring aquablation (p<0.05 for all). With regards to procedure safetly, overall Clavien–Dindo complications were greater for the TURP group (43% vs. 26%; p<0.01). For sexually active men, the anejaculation rates for TURP, aquablation with cautery, and aquablation without cautery were 38%, 16%, and 7%, respectively.
Conclusions: In patients with LUTS due to BPH, surgical prostate resection using a robotically guided/operated waterjet demonstrated non–inferior symptom relief compared to TURP, but with a lower risk of sexual dysfunction. A noteworthy superiority was also observed for LUTS improvements in the larger prostates, suggesting superior tissue removal. This new semi–automated approach may diminish the need for substantial surgical experience to achieve optimal results.

MP–3.3
The use of assisted reproductive technology before male factor infertility evaluation

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Introduction: Some centres are offering assisted reproductive technologies (ART) (intra–uterine insemination [IUI] and in–vitro fertilization [IVF]), to treat certain couples with male factor infertility without or before having the infertile men assessed by male infertility specialists. We sought to compare the characteristics of couples having or not having prior ART use.
Methods: We used our prospectively collected database to identify men undergoing an initial evaluation for male infertility between 2008 and 2017. We obtained data on patient demographics, the use of IUI and IVF, and semen analysis parameters. We used multivariable logistic regression to identify characteristics associated with prior use of ART.
Results: A total of 1545/8962 (17.2%) men reported the use of ARTs prior to evaluation in our clinic. Of these, 998 and 289 had tried IUI and IVF, respectively, while 258 had tried both IUI and IVF. More than one attempt was reported in 470 (37.2%) and 154 (28.2%) of men with prior IUI and IVF, respectively. Younger male age (adjusted odds ratio [aOR] 0.97 for each one–year increase; 95% confidence interval [CI] 0.95–0.99), older female partner age (aOR 1.07 for each one–year increase; 95% CI 1.04–1.10), and year of visit (aOR 1.05 for each one–year increase; 95% CI 1.01–1.09) were significantly associated with prior use of IUI. Older female partner age (aOR 1.07 for each one–year increase; 95% CI 1.02–1.12) was significantly associated with prior use of IVF, but not male age or year of visit. None of the semen analysis parameters, nor duration of infertility were associated with prior IUI or IVF.
Conclusions: The prior use of ART is common among men presenting for an initial evaluation at a male infertility specialty clinic. Older female partner

age was associated with prior ART, however, semen analysis parameters or duration of infertility were not. These results help us understand why couples are being treated with ARTs prior to a male infertility investigation.

MP–3.4

Cost–utility analysis of upfront pharmacotherapy compared to an upfront surgical intervention for patients with moderate–to–severe benign prostatic hyperplasia

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Introduction: The purpose of our study was to evaluate the cost–utility of upfront pharmacotherapy (i.e., alpha–blockers, 5–alpha reductase inhibitors, or combination) followed by delayed surgical intervention (i.e., either transurethral resection of the prostate [TURP], or photoselective vapourization of the prostate [PVP] using Greenlight laser [GL]) compared to surgery as initial treatment.

Methods: The target population was men with a mean age of 65 years with moderate–to–severe symptoms with no contraindications for benign prostatic hyperplasia (BPH) surgery. A microsimulation model was developed to project the costs and quality–adjusted life years (QALYs) of the target population. Costs of pharmacotherapy was obtained from the Ontario Drug Benefit Formulary. Costs of BPH surgeries were collected retrospectively. All other parameters were obtained from the literature. The cost–utility analysis was performed from a public payer perspective using a life–time time horizon, a discount rate of 1.5%, and a cost–effectiveness threshold of $50 000 per QALY gained. Probabilistic analysis was performed to estimate parameter uncertainty.

Results: Compared to the upfront pharmacotherapy options, upfront surgical interventions were, on average, more costly and more effective. All options involving upfront pharmacotherapy followed by delayed TURP were dominated. Upfront TURP was the most costly and most effective option, followed by upfront GL–PVP. On average, upfront TURP cost $1015 more and resulted in a marginal gain of 0.03 QALYs compared to upfront GL–PVP. This translated to an incremental cost per QALY gained of $29 066. Probabilistic analysis indicated that upfront BPH surgery would be the optimal choice for cost–effectiveness thresholds over $18 000 per QALY.

Conclusions: In general, upfront BPH surgery is cost–effective compared to pharmacotherapy. Given the lower costs, relative effectiveness, and better safety, GL–PVP may be considered as an upfront intervention for certain patients with moderate–to–severe BPH.

MP–3.5

Karl Storz® DrillCut™ vs. Lumenis® VersaCut™ prostate tissue morcellators after holmium laser enucleation: A prospective, randomized controlled trial

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Introduction: The DrillCut™ morcellator has been recently introduced by Karl Storz® with unique features designed to optimize the critical step of the holmium laser enucleation of the prostate (HoLEP). To date, the comparative efficacy of the new Karl Storz® DrillCut™ device remains undetermined. Therefore, the objective of the present study was to compare safety, efficacy and cost–effectiveness outcomes between the new Karl Storz® DrillCut™ and Lumenis® VersaCut™ prostate tissue morcellation devices after HoLEP.

Methods: After obtaining ethics approval, consecutive patients undergoing HoLEP for symptomatic benign prostatic hyperplasia were randomized to have their enucleated prostates morcellated by either Karl Storz® DrillCut™ or Lumenis® VersaCut™ morcellators. All procedures were performed by two experienced urologists. Patients' demographics and perioperative data were recorded. Both morcellators were compared for their safety, efficacy, and cost–effectiveness outcomes.

Results: A total of 82 patients were included in the study (41 per arm). Both groups were comparable in terms of age, preoperative prostate size (114 vs. 112 mL; p>0.05), enucleation time (95.3 vs. 91.7 minutes; p> 0.05), and morcellation time (21.6 vs. 18.3 minutes; p>0.05). However, the DrillCut™ morcellator was associated with significantly lower morcellation efficiency when compared with the VersaCut™ (3.8% vs. 4.9% g/min; p=0.03). There was no significant difference between morcellators in terms of complication rates (7.3 vs. 2.4%; p=0.1). There was one case of small bladder perforation requiring abdominal exploration with the VersaCut™ morcellator. The cost of disposable instruments were higher with the new DrillCut™ morcellator when compared with the VersaCut™ ($247.5 vs.$160.9; p<0.01).

Conclusions: The new Karl Storz® DrillCut™ morcellator was associated with significantly lower morcellation efficiency and higher cost of disposables when compared with Lumenis® VersaCut™ morcellator.

MP–3.6

Robotic simple prostatectomy for large–volume adenomas after prior benign prostatic hyperplasia surgery

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Introduction: Surgical treatment options for symptomatic bladder outlet obstruction associated with benign prostatic hyperplasia (BPH) in patients with large adenoma (>100 cc) are open simple prostatectomy (OSP) and holmium enucleation of the prostate (HoLEP). Robotic simple prostatectomy (RSP) has recently evolved as a minimally invasive alternative to OSP with improved perioperative morbidity. There is limited data reporting its use in patients that have had previous BPH surgery.

Methods: We retrospectively reviewed records of 132 patients that underwent RSP for symptomatic BPH from May 2011 to September 2017 at our institution and identified patients that had a previous BPH surgery. Perioperative outcomes, including transfusion, complications, length of catheterization, and hospitalization, were examined. Functional outcomes, including International Prostate Symptom Score (IPSS), peak urinary flow (Qmax), and post–void residual (PVR), were analyzed with a median followup of six months.

Results: A total of 28 patients that underwent RSP had previous BPH surgical therapy: transurethral resection of the prostate (TURP) (n=12), transurethral microwave therapy (TUMT) (n=10), Greenlight photoselective vaporization of the prostate (PVP) (n=4), HolEP (n=1), and open retropubic prostatectomy (n=1). Despite these previous interventions, the mean preoperative prostate volume was 143.6 cc and 57% of patients were in urinary retention at baseline (Table 1; available at https://cua.guide/). Mean operative time and estimated blood loss (EBL) were 242 minutes and 149 ml, respectively. No intraoperative complication or need for transfusion was observed. Mean hospital stay was four days and mean catether duration was seven days. Hematuria requiring cystoscopic fulguration (Clavien 3a) was the solitary complication. Postoperative functional outcomes with a followup of six months, including IPSS, Qmax, and PVR, were all significantly improved (p<0.5 for all) compared to baselines (Fig. 1; available at https://cua.guide/).

Conclusions: RSP can be a safe and efficient surgical option for patients with recurrence of symptomatic BPH for prostate size >100 cc after previous BPH surgery.

MP–3.7

To TURP or not to TURP: How do urologists use non–traditional urodynamic results when treating male lower urinary tract symptoms?

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Study Groups: Dr. McGarry was supported by a CUA Pfizer Incontinence Grant.

Introduction: High–pressure, low–flow urodynamics is a well–understood finding with benign prostatic hyperplasia (BPH), however there is little research to suggest what to do with other urodynamic findings when a transurethral resection of prostate (TURP) is being considered.

Methods: We created four clinical scenarios. An online survey was distributed to members of the International Continence Society and the Society for Urodynamics and Female Pelvic Medicine, & Urogenital Reconstruction.

Results: Forty urologists responded. Median age was 55–65 years, 67% described their practice as academic, 39% of respondents estimated that they did more than 50 TURPs per year, and 41% generally performed urodynamics before TURP. Scenario 1: A man with an incidental residual urine >1 L who could void a small volume of urine with a normal detrusor pressure and medium urine flow. The majority (79%) would offer a TURP, however, the average chance urologists quote that his residual volume would improve was only 58%. Scenario 2: A man with catheter–dependent retention and detrusor overactivity, but no voluntary voiding contraction. The majority (76%) would offer a TURP, however, the average chance quoted that he would void was only 48%. Scenario 3: A man with catheter–dependent retention and an underactive detrusor (low–pressure, low–flow voiding). The majority (86%) would offer him a TURP, however, the average chance quoted that he would void was only 55%. Scenario 4: A man with only frequency and urgency, but high–pressure, low–flow voiding. The majority (88%) would offer him a TURP, however, the average chance that his frequency and urgency would improve was only 63%, and the average postoperative risk of urgency incontinence was 28%. Hydronephrosis, a median lobe, or catheter intolerance made it more likely that the patient would be offered a TURP.

Conclusion: Even with urodynamic results that are not traditionally an indication for a TURP, this operation is often recommended despite the modest results that are expected.

MP–3.8

Top–down technique holmium laser enucleation of the prostate (video presentation)

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Introduction: Holmium laser enucleation of the prostate (HoLEP) is widely regarded as a challenging procedure to perform. Its prolonged learning curve, in comparison with transurethral resection of the prostate (TURP), has limited its acceptance in urological clinical practice. The top–down enucleation technique aims to simplify the HoLEP procedure while simultaneously reducing operative time and shortening the learning curve.

Methods: Between October 2017 and December 2017, 20 patients with benign prostatic hyperplasia (BPH) underwent HoLEP with the top–down technique. All cases were operated upon by a single urologist (HE).We used a 100 W holmium:YAG laser (VersaPulse PowerSuite, Lumenis, Yokneam, Israel) with a 550 mm laser fiber and a 28 Fr continuous flow resectoscope (Karl Storz, Germany). Enucleated tissue was morcellated using a Karl Storz Morcellator. The surgical parameters, including enucleation time, morcellation time, and intraoperative complications,were evaluated. A video of the surgical technique, slides, and a voiceover narration are included.

Results: We demonstrate our version of this technique and present early operative outcomes. One posterior groove is used allowing simultaneous enucleation of median lobe with attached lateral lobe. Top–down enucleation started at 12 o'clock, which is extended anteroposteriorly and downwardly toward the apical adenoma in the 6 o'clock position. The mucosal strip is easily visualized as the apical dissection is performed from top down. This eliminates the need to encircle the mucosal strip reducing enucleation time. There were no reported intraoperative complications (i.e., bladder mucosal injury, capsular perforation, ureteral orifice injury) during morcellation.

Conclusions: We expect that this new technique may reduce the complexity, operating time, and learning curve for urologists performing the HoLEP procedure.

MP–3.9

Photoselective vaporization of the prostate: Evaluation of conflicts of interest and industrial sponsorship stratified by outcome

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Introduction: Photoselective vaporization of the prostate (PVP) is an accepted treatment modality for non–neurogenic lower urinary tract symptoms secondary to prostate enlargement. Conflicts of interest (COIs) and industrial sponsorship (IS) might have an impact on the reporting of outcomes of studies assessing efficacy, safety, or cost parameters of PVP. The aim of the current investigation was to evaluate COIs and IS stratified by study outcome of studies involving either one of the three PVP systems (80W, 120W or 180W).

Methods: MEDLINE and EMBASE were systematically searched (January 1990 to August 2017). Comparative studies (randomized controlled trials [RCTs] and non–randomized comparative studies [NRCSs]), in which PVP was one treatment modality were included in the final analysis. Sponsorship assessment distinguished between IS and non–industrial sponsoring. Two reviewers screened all abstracts and full–text articles independently. Disagreement was resolved by reference to an independent third reviewer. Favourability of outcome was evaluated on a binary scale by two independent board–certified urologists. Descriptive statistics were used for data analysis.

Results: After full–text screening of 286 articles, 65 studies could be included into the final analysis. The results of the COI and sponsorship evaluation are presented in Table 1 (available at https://cua.guide/). The majority of the studies mentioned the absence/presence of potential COIs (78%). In contrast, a sponsorship statement was only found in 29% of the studies. The group of studies considering PVP equal/superior to the control arm had a higher percentage of COIs (42% vs. 31%) and IS (8% vs. 3%) compared to the group of studies considering PVP inferior to the control procedure.

Conclusions: A majority of all RCTs and NRCSs on PVP mention the absence/presence of potential COIs. However, a sponsorship statement was identifiable in only about one–third of all studies. COIs and IS were more frequent in studies reporting favourable outcomes of PVP.

MP–3.10

Classifying the health behaviours of Canadian men as basis for making recommendations for targeted interventions

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Study Groups: AUA Scholar Award, NY Section (RF); Canadian Men's Health Foundation; Public Health Agency of Canada.

Introduction: Masculine ideals and norms can encourage men's risky health behaviours and limit their health–promoting practices, leading to preventable morbidity and mortality. Our aim was to evaluate a broad range of health behaviours and construct a total health behaviour classification, as a means to making recommendations for targeted interventions.
Methods: Men completed a 15–minute online survey, querying their demographics and five health behaviours: smoking, alcohol, sleep, exercise, and diet, as well as depression, a surrogate for mental well–being. Each behaviour was classified as a binary healthy or unhealthy outcome based upon a priori questionnaire thresholds. For our novel total health behaviour classification, men were considered very healthy if no unhealthy behaviours, healthy if 1/6 unhealthy behaviour, borderline with 2/6, and unhealthy with 3–6/6 unhealthy behaviours. Multivariate logistic regression was performed to identify variables predictive of total health behaviour classification (STATA).
Results: A total of 5360 participants visited the online survey page. After examining sample stratification, inclusion and exclusion criteria, 2000 Canadian men aged 19–94 completed the survey. Table 1 (available at https://cua.guide/) demonstrates men distributed among the total health classification. Multivariate analysis identified increased healthy behaviours among older (p=0.001) and retired men (p=0.008), odds ratio (OR) 0.983 (95% confidence interval [CI] 0.973–0.993) and 0.635 (95% CI 0.454–0.889), respectively. A positive trend for number of healthy behaviours was observed for men with higher income. Men with hypertension (OR 1.400; 1.100–1.786; p=0.007) and erectile dysfunction (OR1.923; 1.289–2.871; p=0.001) were associated with unhealthy behaviours.
Conclusions: An alarming half of Canadian men (47.4%) were classified as unhealthy, with 3–6/6 unhealthy behaviours, affirming the need for targeted interventions. Specifically, these findings reveal significant health inequities within subgroups of Canadian men and will guide the content and delivery of precision/personalized communications.

MP–3.11

Marijuana use may not impact male sexual function or frequency: Statistical significance as a smoke screen in sexual medicine

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Introduction: As marijuana becomes legal in many North American jurisdictions, interest regarding its impact on sexual function has increased. Previous studies have demonstrated the deleterious effect of marijuana use on fertility.[1] A recent, highly publicized study demonstrated that marijuana users have more frequent sexual activity than non–users.[2] However, there is limited evidence examining the impact of marijuana on male sexual function. The following report explores the impact of marijuana on frequency of sexual activity, erectile function (via the Sexual Health Inventory for Men [SHIM]), hormonal profiles and Androgen Deficiency in the Aging Male (ADAM) scores.
Methods: A retrospective cohort study was performed on an andrology database of 8879 male patients from a single academic centre between 2008 and 2017. Marijuana users and controls (non–users) were identified and compared. Cases and controls were analyzed with regards to hormonal profiles, SHIM scores, ADAM scores, and reported sexual frequency. Simple t–test and Chi–square square analyses were performed to assess the statistical significance of our findings.
Results: Of 8879 study subjects, 1103 (12.4%) marijuana users were identified and were matched to 7674 controls who reported not using marijuana. Mean age of marijuana users was 34.3 years (±3.2) and of controls was 36.7 years (±2.8). The mean frequency of sexual activity was higher in marijuana users at 8.8 times/month (±5.1) compared with non–users at 7.8 times/month (±4.9) (p<0.001). The mean serum testosterone concentration was significantly higher among marijuana users 14.27 nmol/L (±6.1), compared to non–users 12.96 nmol/L (±5.9) (p<0.001). Similarly, marijuana users reported higher SHIM scores (21.9±4.4 vs. 21.3±4.7) (p<0.001). Marijuana users were more likely to report positive ADAM scores (33.9% vs. 29.5% in non–users) (p<0.001). Finally, marijuana users were less likely to report a SHIM score ≤21 (29% vs. 34%)(p<0.001).
Conclusions: In this cohort of patients presenting to an andrology clinic, marijuana users had statistically significantly higher serum testosterone levels and SHIM scores, were more likely to report positive ADAM scores, and were less likely to report SHIM scores <21. In addition, marijuana users engage in sexual intercourse more frequently. However, these differences are unlikely to be clinically significant. This study fails to demonstrate a deleterious effect of marijuana consumption on male sexual function.
References:
1. Gundersen TD, Jørgensen N, Andersson AM, et al. Association between use of marijuana and male reproductive hormones and semen quality: A study among 1215 healthy young men. *Am J Epidemiol* 2015;182:473–81. https://doi.org/10.1093/aje/kwv135
2. Sun AJ, Eisenberg ML. Association between marijuana use and sexual frequency in the United States: A population–based study. *J Sex Med* 2017;14:1342–7. https://doi.org/10.1016/j.jsxm.2017.09.005

MP–3.12

Access to penile prostheses differ significantly across provinces in Canada: A survey of Canadian urologists

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Introduction: Surgical implantation of a penile prosthesis is the gold standard treatment for refractory erectile dysfunction. The purpose of this study was to evaluate access to these procedures in Canada.
Methods: Canadian urologists known to implant penile prostheses were surveyed on areas such as surgical volume, type of prostheses used, and the direct cost to patients for both malleable and inflatable devices.
Results: Of the 50 urologists invited to participate in this study, 34 (68%) completed the survey. Participants represented nine of 10 Canadian provinces and included a mix of academic (65%) and community (35%) urologists. American Medical Systems (AMS) prostheses were used exclusively by 88% of participants, while 12% used both AMS and Coloplast products. The majority (79%) performed less than 20 procedures per year. Roughly three–quarters (74%) of participants used inflatable prostheses in over 90% of cases, while half implanted inflatable prostheses exclusively. Participants from Alberta, Manitoba, New Brunswick, and Newfoundland reported full coverage for both malleable and inflatable prostheses. Saskatchewan was the only province participants reported having no coverage for either. Nova Scotia was found to have full coverage for malleable and partial coverage for inflatable prostheses. Participants from the remaining provinces of British Columbia, Ontario, and Quebec reported variable coverage based on healthcare centre. Across all centres without full coverage, the mean reported cost to patients for malleable and inflatable prostheses were $5100 and $6782, respectively.
Conclusions: Urologists surveyed perform primarily inflatable penile prostheses procedures with a preference for AMS products. Significant geographical differences exist with respect to reported coverage for these procedures. This study highlights the need for continued advocacy on behalf of the urological community towards the goal of equity in coverage for penile prostheses across Canada.

UP–3.1

Top–down holmium laser enucleation of the prostate: Initial Ontario experience

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Introduction: Top–down holmium laser enucleation of the prostate (HoLEP) has emerged as a novel modification for the original HoLEP, aiming for better visualization of the apical urethral mucosa and higher continence rate. The aim of our study was to present our first Ontario experience in applying HoLEP modification in a group of patients with benign prostatic hyperplasis (BPH).
Methods: Our study included 20 consecutive patients managed by a single urologist (HE). Top–down HoLEP was performed. Holmium laser (100 Watt), a continuous flow (28 Fr) resectoscope, and a tissue morcel-

lator (Karl Storz, Germany) were used. Prostate volume, resected prostatic weight, operative parameters (enucleation time, morcellation time, and intraoperative complications), and a one–month postoperative assessment of urinary continence and flow rate were recorded.

Results: The median patient age was 72.5 years (58–87). Thirteen patients (65%) required surgery due to refractory acute urine retention. Two patients (10%) previously underwent transurethral resection of the prostate (TURP). The median prostatic volume, resected prostatic weight, and resected prostatic tissue percentage were 120 cc (90–243), 95 g (50–190), and 82% (53–92), respectively. The median enucleation and morcellation times were 80.5 (50–110) and 17 (7–45) minutes, respectively, with a morcellation rate of 5.4 g/min. No single patient required blood transfusion and there were no recorded intraoperative complications. One patient (5%) developed clot retention few days following surgery, associated with early heavy manual work, requiring readmission for clot evacuation. The median postoperative peak flow rate (Qmax) was 21 ml/sec. Urge and stress urinary incontinence happened in four (20%) and one (5%) patient, respectively.

Conclusions: Top–down HoLEP was a modification on the right pathway and has promising results. In our case series, this technique was associated with a markedly lower incontinence rate compared to the outcomes of the original HoLEP. Larger and longer studies are needed to demonstrate long–term durability of this technique.

Poster Session 4: Endourology
June 25, 2018; 0800–0930

MP–4.1
Effects of a changing patient population on percutaneous nephrolithotomy outcomes

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Introduction: The incidence of nephrolithiasis and the use of percutaneous nephrolithotomy (PCNL) has risen significantly over the years. Along with this, patient populations are becoming increasingly complex. The objective of our study was to determine the impact of changes in patient demographics over a 25–year time period on PCNL outcomes.

Methods: A retrospective analysis on a prospectively maintained database was carried out from July 1990 to 2015, including 2554 consecutive PCNL treatments in 2486 patients. Patients were divided into equal terciles of 852 consecutive procedures ordered chronologically. Patient demographics, comorbidities, and stone and procedure characteristics were analyzed. A multivariate logistic regression was used to evaluate differences in operative duration, adverse events, stone–free rate, and hospital length of stay.

Results: A total of 2486 patients with a mean age of 54±15 years, body mass index (BMI) of 31±8, and stone surface area of 895±602 mm^2 were analyzed. Almost half of patients (46.9%) had medical comorbidities, including hypertension (22%), diabetes (14%), and cardiac disease (13%). Overall complication rate was 15.6%, including a 2.5% rate of major complications (Clavien grade 3–5). There was a statistically significant increase in patient age, BMI, comorbidities, and American Society of Anesthesiologists (ASA) score over time, which was correlated with an increased complication rate (odds ratio [OR] 1.15; p=0.010). The overall transfusion rate was 1.0%, and remained stable (p=0.131). With time, both operating rom duration (mean Δ 16 minutes; p<0.001) and hospital length of stay (mean Δ 3 days; p<0.001) decreased significantly. Stone–free rate of 1873 patients with available three–month followup was 86.7% and decreased significantly over time (OR 1.09; p<0.001), but was correlated with an increased use of computed tomography scans for followup imaging.

Conclusions: Despite an increasing complex patient population, PCNL remains a safe and effective procedure with a high stone–free rate and low risk of complications.

MP–4.2
A high–fidelity transurethral resection of bladder tumour simulator: Validation as a tool for training

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Introduction: Simulation–based training is used in urology to help trainees learn challenging procedures safely. To date, there has been no publication of a successfully validated transurethral resection of bladder tumour (TURBT) simulator. We aim to test the face, content, and construct validity of the Simbionix TURBT Mentor (Simbionix LTD, Airport City, Israel).

Methods: Urologists and urology residents performed five rounds of standardized training on the simulator. Participant performance was assessed by the simulator's built–in metrics. Pre– and post–simulation questionnaires were completed by participants. A level of 4.0 or higher on five–point Likert scale was defined as acceptable based on review of literature.[1] Participants were classified as expert or novice based on a cutoff of 50 real procedures performed.

Results: Eight experts (including one resident) and nine novices completed the training. Face validity was acceptable among experts (mean realism 4.00±0.93 standard deviation [SD]; 4.13±0.641), but not novices (3.22±0.667; 3.33±1.12). Overall simulation of key steps (content validity) was acceptable among experts (mean 4.00±0.93). Individual elements were acceptable in 4/8 domains. Lowest scores were for fluid management and depth of resection. There was no significant difference between groups on any performance metrics (resection %, visualization, safety, economy, resection time, rate of perforation, or total score). Overall, 94.1% of all participants (100% of experts) agreed the simulator should be in the official urology curriculum.

Conclusions: Based on expert assessment, the TURBT Mentor achieved face and content validity. The simulator did not demonstrate construct validity, as novices and experts showed no difference in performance. Participants endorsed its use in urology training. Our study suggests there is a role for using the device as an introduction to TURBT for trainees. Improvements could be made in fluid management, depth of resection, and scoring of performance.

Reference:

1. Schout B, Bemelmans B, Martens E, et al. How useful and realistic is the uro trainer for training transurethral prostate and bladder tumour resection procedures? *J Urol* 2009;181:1297–1303. https://doi.org/10.1016/j.juro.2008.10.169

MP–4.3
To stent or not to stent: A Cochrane review and meta–analysis

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Introduction: The role of ureteral stent placement following uncomplicated ureteroscopy for ureteral and renal calculi remains controversial. We performed this review to better understand the tradeoffs of stenting vs. not stenting to inform clinical decision–making.

Methods: We conducted a Cochrane review based on published a priori protocol. We searched multiple data sources for published and unpublished randomized controlled trials (RCTs) in any language. Review outcomes were included unplanned return visits, need for secondary interventions, operating room (OR) time, urinary tract infections (UTIs), and ureteral stricture rates. We completed title/abstract and full–text screening in duplicate using Covidence software. Based on a priori published protocol, we performed meta–analysis using RevMan 5.3 software using random effect models and rated the quality of evidence using GRADE.

Results: We screened the titles/abstracts of 3459 references and subsequently 32 full–text studies, of which ultimately 24 met our inclusion criteria. We found that stenting may not change the rate of secondary interventions with a risk ratio (RR) of 0.65 (95% confidence interval [CI] 0.24–1.77; low–quality evidence); this corresponds to six fewer (14 fewer to 14 more) per 1000 patients. Stenting may also not change the rate of return to the hospital, with a RR of 0.77 (95% CI 0.48–1.24; low–quality evidence); this

corresponds to 14 fewer (95% CI 33 fewer to 15 more) per 1000 patients. Based on moderate–quality evidence, OR time is likely longer by a mean difference of 4.0 minutes (95% CI 2.2–5.9). Stenting may also not impact strictures rates (RR 0.88; 95% CI 0.30–2.59; low–quality evidence); this corresponds to one fewer (6 fewer to 13 more) per 1000.
Conclusions: Findings of this systematic review failed to demonstrate the merits of routine postoperative stent in patients undergoing uncomplicated ureteroscopy for stone disease.

MP–4.4
Medical expulsive therapy in pregnancy: A retrospective study
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Introduction: The use of medical expulsive therapy (MET) is common practice in urology for the treatment of symptomatic urolithiasis, despite debates over its efficacy. Its use in pregnancy is even more controversial because of poor safety data. Our objective is to evaluate the safety and efficacy of tamsulosin 0.4 mg once a day as a MET in pregnant women.
Methods: We retrospectively identified pregnant patients who presented with renal colic at the CHU de Québec from 2000–2015. We compared patients who received tamsulosin as MET to a control group without MET. We evaluated efficacy as passage rate of lithiasis and necessity of intervention or additional treatment. We evaluated safety of the treatment according to fetal outcomes (fetal weight at birth, APGAR, gestational age, etc.)
Results: We evaluated 207 pregnant patients presenting renal colic; 69 patients in the MET group were compared to 138 patients in the control group. Of these, 48 (70%) in the tamsulosin therapy group and 76 (55%) in the control group had proven urolithiasis. No significant difference was found for mean gestational age, birthweight at term, and APGAR. No sudden death infant syndrome was encountered in neither group. There was no significant difference for length of hospitalization stay and need for surgical intervention. The spontaneous passage rate was 52% (25/48) in the MET group compared to 38% (29/76) in the control group, but this difference was not statistically significant (p=0.13). Tamsulosin therapy was associated with longer time to spontaneous passage (mean 34 vs. 17 days; p=0.01).
Conclusions: Short–term use of tamsulosin as MET in pregnancy is not associated with adverse maternal or infant outcomes. Moreover, there was no significant adjunct for the rate of stone passage. Conservative management of renal colic in pregnancy remains a safe treatment option. Further studies are needed in the evaluation of MET as adjunctive therapy for symptomatic urolithiasis during pregnancy.

MP–4.5
Minimizing ionizing radiation exposure during retrograde fluoroscopic–guided ureteral stent insertion in the pregnant patient
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Introduction: Of pregnant women who develop symptomatic renal stone disease, 20–30% will require intervention.[1–3] One treatment that continues to be used is retrograde ureteric stent insertion under fluoroscopic guidance. Unfortunately, X–ray is a known teratogen. Protecting the fetus with lead aprons has been recommended, but not well–studied.[3] We devised an experiment to investigate this.
Methods: A phantom was assembled using methyl methacrylate to mimic a pregnant patient undergoing a fluoroscopic procedure. A standard 20 cc syringe containing 15 cc of omnipaque contrast agent at 50% concentration, was used to mimic the renal collecting system. A dosimeter was positioned at the approximate position of the fetus and adjacent to the kidney. The experimental setup in shown in Fig. 1 (available at https://cua.guide/). Dose measurements were carried out at the fetal location with no shielding used, fetal location shielded, beam collimated to avoid fetal location and adjacent to the kidney with fetal location shielded. Measurements were taken for all four combinations with normal or low–dose fluoroscopy modes, and continuous or pulsed fluoroscopy.
Results: Results are shown in Table 1 (available at https://cua.guide/). In summary, minimum fetal dose is obtained when the beam is collimated such that the fetus is completely outside of the irradiated field of view, with a reduction in fetal dose of almost 90% relative to the situation where the fetus is within the field of view. Shielding the fetus with 0.5 mm lead equivalent thyroid shields reduced fetal dose by roughly 70%, while increasing kidney dose by roughly 40%. Using low–dose instead of normal fluoroscopy, and pulsed instead of continuous fluoroscopy, provides significant dose–sparing to both the mother and the fetus.
Conclusions: Using pulsed low–dose fluoroscopy with culmination is the most effective fluoroscopy setting to minimize radiation exposure to the fetus. Shielding with thyroid collars while reducing dose to the shielded area increases exposure to the surrounding tissues .
References:
1. Blanco LT, Socarras MR, Montero RF, et al. Renal colic during pregnancy: Diagnostic and therapeutic aspects. Literature review. *Central Eur J Urol* 2017;70:93–100.
2. McAleer SJ, Loughlin KR. Nephrolithiasis and pregnancy. *Curr O Urol* 2004;14:123–7. https://doi.org/10.1097/00042307–200403000–00013
3. Alan J, Wein AJ, Kavoussi LR, et al. Campell–Walsh Urology. 11th Edition. 2015. ISBN 978–1455775675.

MP–4.6
Metabolic evaluation guidelines in patients with nephrolithiasis: Are they being followed? Results of a national, multi–institutional quality assessment study
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Introduction: The significant cost burden of kidney stones underscores the importance of best clinical practice in kidney stone management. We evaluated adherence to kidney stone metabolic evaluation guidelines in a Canadian population and the interest of patients with regard to kidney stone prevention.
Methods: A questionnaire based on Canadian Urological Association best practice guidelines was designed. Patients presenting for shockwave lithotripsy treatment (SWL) were administered this questionnaire to evaluate risk factors of stone disease and assess the use of metabolic evaluations. Patients were asked if they received explanations about their results and understood them and if they were interested in kidney stone prevention.
Results: We identified 530 patients at five academic institutions (Table 1; available at https://cua.guide/); 79.4% had at least one strict indication to receive a metabolic evaluation (high–risk stone formers) and 96.6% if first–time stone formers that reported an interest in metabolic evaluation were included. However, only 41.1% of these patients had a metabolic evaluation. Endourologists ordered metabolic evaluation more often than other referring urologists (63.6% vs. 36.5%; p<0.001). Furthermore, urologists ordered metabolic evaluations more often than other prescribing physicians. (68.9% vs. 31.1%; p<0.001) (Fig. 1; available at https://cua.guide/). Sixty–two percent of patients received explanations and 77.5% understood them. Regarding prevention, 84.1% and 83.8% were interested in more explanations and in following a diet or a medication, respectively.
Conclusions: Adherence to metabolic evaluation guidelines is suboptimal and could be improved by general urologists referring patients for SWL. Communication between physicians and patients may not be adequate. The majority of stone formers are interested in kidney stone prevention.

MP–4.7

Routine complete blood count has limited value post–percutaneous nephrolithotomy in identifying hemorrhagic or infectious complications

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Introduction: Percutaneous nephrolithotomy (PCNL) is a minimally invasive procedure with low complication rates reported by high–volume centres; hemorrhage and sepsis rates are typically <5%. Yet, postoperative bloodwork, including complete blood count (CBC), is routinely performed in the early postoperative period at most centres. We set out to determine how effective routine postoperative CBC was in identifying complications after PCNL, as it may represent a low–value care practice.

Methods: A retrospective chart review was performed of all PCNL procedures at our centre from January 2014 to December 2016. PCNL cases performed on renal transplant patients and percutaneous renal access cases for strictures or urothelial tumours were excluded from the analysis. Patient demographics and stone characteristics were collected for analysis, along with postoperative outcome data.

Results: Three hundred and eighty–five patients (196 female, 188 males) underwent PCNL for urolithiasis. Mean age was 55.8 years, mean American Society of Anesthesiology (ASA) score 2.5, and mean length of stay in hospital 1.74 days (±3.3). Postoperatively, six (1.6%) patients required extended stay for CBC monitoring and three (0.8%) patients required transfusion, one of whom also required angioembolization. All patients that required transfusion demonstrated abnormal vital signs (tachycardia and/or hypotension). Of the six patients that required only extended CBC monitoring, two had abnormal vital signs and four had normal vital signs. Mean hospital lengths of stay were 1.6 days, 2.2 days, and 8.8 days for patients with normal postoperative course, requiring CBC monitoring, and requiring blood transfusion/angioembolization, respectively. Fourteen patients developed sepsis post–PCNL (3.6%). All of these patients developed abnormal vital signs postoperatively (fever, tachycardia, and/or hypotension) and had a mean hospital stay of 5.1 days. Patients that developed either systemic inflammatory response syndrome (SIRS) or sepsis were more likely to have a positive preoperative urine culture ($p<0.001$).

Conclusions: Routine postoperative CBC after PCNL does not improve identification of hemorrhagic or infectious complications. Abnormal vital signs alone identified all patients that required transfusion or embolization after PCNL and the development of SIRS or sepsis. Length of stay for patients undergoing CBC monitoring in the setting of normal vital signs was a day longer and resulted in no clinical benefit.

MP–4.8

The effect of extracorporeal shockwave lithotripter reassembly on clinical outcomes

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Introduction: Extracorporeal shockwave lithotripsy (SWL) remains an effective treatment modality in the armamentarium of the modern endourologist. Currently, there is no industry standards with respect to maintenance and clinical efficacy. Our centre's fixed SWL unit (Storz Modulith SLX) was recently disassembled and transported to a new facility, after which fragmentation appeared to improve anecdotally. Therefore, we examined whether stone outcomes were affected by the complete reassembly of our lithotripter.

Methods: A retrospective review of 200 SWL patients was performed. All patients were treated under sedation by one of five urologists. We compared two cohorts of 100 patients, before and after transporting the unit. Patient, stone, and treatment characteristics were recorded, along with outcome and complication data. Statistical analysis was performed using a two–tailed, heteroscedastic t–test and Fisher–exact test.

Results: There were no baseline characteristic differences between pre– and post–reassembly groups with respect to mean age (52.7 vs. 53.2 years), Charlson–Comorbidity Index (1.54 vs. 1.53), first time ESWL treatment (85 vs. 77%), mean stone size (8.98 vs. 9.59 mm), or stone location ($p>0.05$). Mean time to post–treatment followup kidney/ureter/bladder (KUB) imaging was 2.7 and 2.6 weeks in the pre– and post–reassembly groups. The stone–free rates (30 vs. 49%; $p=0.009$) and the proportion experiencing no stone fragmentation (21 vs. 7%; $p=0.007$) improved significantly after reassembly. There was no difference in complication rates (5 vs. 8%) or proportion requiring subsequent ESWL or ureteroscopy treatments ($p>0.05$).

Conclusions: Following the complete disassembly and reassembly of our lithotriptor, we detected improvements in early stone–free rates and fragmentation effects, with no change in complication rate. Therefore, an opportunity exists in benchmarking performance standards for SWL manufacturers and service providers, to ensure function is optimized for clinical use.

MP–4.9

Assessing the relationship between obstructive sleep apnea and stone disease

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Introduction: Though kidney stones are common, obstructive sleep apnea (OSA) is also quite prevalent, affecting 20% of the population. Therefore, the objective of this study was to identify the rate of OSA in our patients undergoing shockwave lithotripsy (SWL) and its impact on treatment and stone risk.

Methods: A retrospective review of all SWL patients from Sept 2016–June 2017 was performed. At our centre, SWL performed under sedation requires a STOPBANG questionnaire for OSA risk stratification by our respiratory therapist. Low–risk (LR), high–risk (HR), previously diagnosed and compliant with continuous positive airway pressure (CPAP) (OSA–C), or non–compliant (OSA–NC) groups were then compared.

Results: We reviewed 560 patients with an average age of 54 years and body mass index (BMI) of 29.6; 62% were male. Eighty–five (14.6%) were previously diagnosed with OSA. Two hundred fifteen HR and 282 LR patients were identified, and CPAP compliance was found in 64% of those previously diagnosed with OSA. OSA–C had the largest stones (73 mm^2; $p=0.01$), with no significant difference in number of stones. OSA–NC had the lowest stone Hounsfield units ($p=0.03$). LR patients had significantly lower BMI scores (27.6) (31 HR, 33.3 OSA–NC, 33.9 OSA–NC; $p=0.01$). With no significant differences in treatment parameters (shocks, energy level, rate) during SWL, fragmentation was found to be significantly more effective in LR. Stone analysis also showed significantly more stones with uric acid in OSA (40 OSA vs. 15 HR vs. 6 LR patients; $p=0.031$). This is in keeping with metabolic evaluations, where OSA–NC patients had more acidic urine (pH5.4; $p=0.04$), and higher serum uric acid levels (366; $p=0.015$). When assessing fragmentation, number of stones, and stone size, the effect of OSA status on multivariate linear regression models remained unchanged when age, gender, and metabolic syndrome variables were included in the model (B1 18–17.11; $p<0.05$). However, when BMI was included in the model, OSA became insignificant.

Conclusions: Patients with OSA are over–represented in this kidney stone cohort. Their treatment efficacy appears to be reduced, and stone risks are consistent with metabolic syndrome. Ultimately, stone patients should be carefully monitored during/after procedural sedation or general anesthetic due to their high risk of occult OSA and associated complications.

MP–4.10

Initial clinical testing of ureteral access sheath force sensor to prevent ureteral injuries

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Introduction: Ureteral injury is a major concern with regard to deployment of an ureteral access sheath (UAS). The force that results in ureteral injury in humans has not been defined. In a previous study, using a novel UAS Force Sensor (UAS–FS) (Fig. 1; available at https://cua.guide/), we noted that a peak force of 8 Newtons (N) resulted in splitting of the ureter in a porcine model. Herein, we present our initial clinical findings using UAS–FS during routine ureteroscopy.

Methods: Among 24 patients, tamsulosin was given for up to a week prior to UAS deployment in 88% in an attempt to induce a state of ureteral relaxation. UAS deployment force was measured using UAS–FS under fluoroscopic control by four different surgeons. Continuous measurements began when the tip of the UAS was inserted into the urethra and ceased when the tip of the UAS reached the ureteropelvic junction. If the force approached/began to exceed 8 N (audible sound), passage was stopped, progress of the UAS was recorded fluoroscopically, and the UAS was withdrawn and a smaller UAS selected. Ureteroscopic evaluation of the entire ureter was performed at the end of each case to assess for potential ureteral injuries using the post–ureteroscopic lesions scale (PULS).

Results: There were 24 patients among whom there were 32 UAS deployments (Table 1; available at https://cua.guide/). The 16 French (F) UAS could be passed at ≤8 N in 72% of patients; in the remainder the 16 F UAS was withdrawn and a smaller UAS was deployed (14 F in six cases and 11.5 F in one case) being careful to not exceed 8 N (Table 1; available at https://cua.guide/). The mid–ureter location was where the maximum peak pressure (24%) was most commonly recorded. No patient experienced a significant ureteral injury (i.e., PULS ≥3) The mean PULS grade was 0.79.

Conclusions: The UAS–FS was able to measure UAS insertion force in a reproducible fashion. By limiting the force exerted on the UAS to ≤8 N, no significant urothelial injury occurred.

MP–4.11

Are lead glasses necessary? A prospective, multicentre cohort study on radiation exposure to the operator's eyes during urological surgery

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Introduction: Urologists use ionising radiation during surgery. Scattered radiation may expose the surgeon. Few urologists use radiation protection eyewear. Lens radiation causes cataracts, and in 2012, the ICRP lowered the recommended annual eye dose limit by more than 80% to 20000 μSv.[1]

Methods: For all operations using fluoroscopy, commencing in June 2016, the first author wore a Geiger–Müller tube–based digital dosimeter on his forehead. Procedure, consultant, operating table, intensifier model, screening time, dose delivered, and ocular scatter dose received were recorded. Analysis was performed with SPSS™ version 17. Required sample size was 138 cases. Ethical approval was obtained from NSLHD HREC. Reporting followed the STROBE statement for cohort studies.

Results: Dosimetry data were available for 245 of 264 (93%) possible procedures during a one–year study period, amounting to 1638 μSv of measured exposure, and 1827 μSv total exposure when extrapolated for unmeasured cases. There were 84 insertion of ureteric stent procedures, 25 retrograde pyelogram only procedures, 129 ureteroscopic procedures, four percutaneous nephrolithotomy (PCNL) procedures, and three others. Mean eye dose with 95% confidence intervals for ureteric stenting were 5.4±0.8 μSv, for retrograde pyelography were 5.4±0.7 μSv, for ureteroscopic procedures were 7.8±1.5 μSv, for PCNL were 56.8±9.0 μSv, and other procedures were 20.8±3.1 μSv. For the 153 cases with available data, screening times ranged from 2–496 seconds, with dose area products (DAP) of 0.07 to 22.48 Gy/cm^2, respectively. Screening time was related to DAP (B=0.034; p<0.001), which was only partially (B=0.812; p=0.048) a determinant of ocular dose.

Conclusions: Ocular radiation dose was only 9% of the revised annual safe limit. The association between dose delivered to the patient (DAP) and ocular dose was unexpectedly weak. Minimizing exposure is prudent, but excepting very high numbers of interventional procedures (greater than 400 PCNLs yearly), it is unlikely that urologists would exceed safe radiation limits. Wearing lead protective glasses is optional, but not required.

Reference:

1. International Commission on Radiological Protection, Statement on tissue reactions 4825–3093–1464. 2011, ICRP

MP–4.12

Characterizing renal colic management and outcomes in Western Canada

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Introduction: Renal colic affects 10% of the population and is often managed with medical expulsive therapy or early urological intervention. Calgary and Vancouver are two large stone centres with differing approaches to acute renal colic, but comparable patient demographics. We evaluated rates of urological intervention and admission, as well as the need for rescue intervention or readmission at each site.

Methods: We retrospectively reviewed all 2014 Calgary and Vancouver patients with an index visit for renal colic. Emergency department (ED) databases were used to collect arrival mode, triage category, and patient demographics. Regional hospital databases were used to collect ED visits, admissions, and urological intervention. The primary outcome was urological intervention or admission within 60 days of the first visit.

Results: A total of 3283 patients with computed tomography–confirmed stones were characterized. Calgary and Vancouver had similar stone and patient demographics. Calgary patients were more likely to undergo urological intervention or admission than Vancouver patients (60.9% vs. 31.3%; p<0.001). Calgary patients also had higher intervention rates on their first presentation (52.1% vs. 7.5%; p<0.001). For stones less than 5 mm, readmission or rescue intervention occurred significantly less in Vancouver (Table 1; available at https://cua.guide/). Conversely, for stones greater than 5mm, readmission or rescue intervention occurred significantly less in Calgary (Table 1; available at https://cua.guide/).

Conclusions: Calgary patients were more likely to undergo urological intervention or admission than Vancouver patients. Furthermore, our data suggest that medical expulsive therapy for smaller stones (<5 mm) and early urological intervention for large stones (>5 mm) reduces the need for readmission or rescue intervention. We are currently launching a prospective trial between Calgary and Vancouver to better evaluate renal colic, management, and the effect on patient quality of life.

UP–4.1

Holmium laser–assisted endoscopic–guided retrograde nephrostomy access for percutaneous nephrolithotomy in prone split–leg position

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Introduction: Obtaining nephrostomy access remains the most challenging aspect of a percutaneous nephrolithotomy. Herein, we report a novel "inside–out" approach using the holmium laser to establish access in a retrograde fashion.

Methods: After one week of pre–treatment with tamsulosin and following a documented sterile urine, seven patients underwent retrograde, holmium laser–assisted, endoscopic–guided nephrostomy access in a prone, split–leg position (Figs. 1, 2; available at https://cua.guide/) (Table 1; avail-

able at https://cua.guide/). In all cases, a 360 micron laser fiber was used, typically set at 1 J and 10 Hz; the laser was activated as it was pushed into the calyceal fornix and advanced until it exited the skin of the flank.
Results: In six of seven patients (86%), access via an upper pole posterior calyx was achieved using the holmium laser–assisted endoscopic–guided retrograde technique. In one patient, the laser tract was not dilated due to acute angulation; consequently, antegrade endoscopic– and fluoroscopic–guided access was performed. Mean total fluoroscopy time in the six successful cases was 32 seconds (range 5–64). There was one Clavien 3a postoperative complication of a subcapsular hematoma and secondary tearing of an interpolar vessel remote from the site of access necessitating angioembolizaton and transfusion of two units of packed red blood cells.
Conclusions: Holmium laser–assisted endoscopic–guided retrograde access in a prone split–leg position appears to be feasible. Further work is needed in order to better refine the technique and determine the limitations of this approach.

UP–4.2

Shockwave lithotripsy for large renal calculi: Is prophylactic stenting beneficial?

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Introduction: For selected patients, shockwave lithotripsy (SWL) is a minimally invasive treatment option for certain upper tract urinary calculi. It is generally recommended that a ureteric stent be inserted prior to performing SWL for large renal calculi in order to prevent post–procedure complications. We set out to determine if ureteral stenting prior to SWL for large renal calculi affects treatment success and complication rates.
Methods: A matched retrospective cohort study was performed comparing stented and non–stented patients undergoing SWL for solitary large renal calculi at our centre. Patients were matched according to stone size. Large calculi were defined as those with an area of equal to or greater than 200 mm^2 and at least one diameter greater than 15 mm. We compared procedure outcomes and complications at two weeks and three months between patients with and without a pre–SWL stent.
Results: One hundred and sixty–eight patients (84 stented, 84 non–stented matched controls) were identified. There was no differnece in stone size size between stented patients and matched controls (261.1 mm^2 vs. 260.8 mm^2). No significant differences were noted in patients undergoing SWL with or without a stent with respect to presentation to the emergency department post–SWL treatment (13.1% vs. 21.4% NS) and rate of Steinstrasse (10.7% vs. 14.3% NS). Ten patients who were not pre–stented (11.9%) eventually required ureteric stenting after SWL. After two weeks, single–treatment SWL success rates were similar for patients without a stent compared to those with a stent. No difference in success rate was demonstrated after three or less treatments for patients in both groups (78.6% stent vs. 70.2% no stent NS).
Conclusions: In selected patients, pre–SWL stenting for large, solitary renal calculi may not improve stone–free rates, nor reduce Steinstrasse rates. For patients initially receiving SWL without a stent, few patients required ureteric stenting after SWL due to complications.

UP–4.3

Lawson retrograde endoscopic–guided nephrostomy access for percutaneous nephrolithotomy in prone split–leg position

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Introduction: Percutaneous access for percutaneous nephrolithotomy (PCNL) is presently obtained by a minority of urologists. Previous reports have shown retrograde PCNL is easier to learn, however, only in the modified supine position. Herein, we describe our initial experience with Lawson retrograde endoscopic–guided percutaneous access in the prone split–leg position.
Methods: After informed consent, a confirmed negative urine culture, and one–week pre–treatment with tamsulosin, four carefully selected PCNL patients underwent endoscopic–guided retrograde access in a prone, split–leg position using the Lawson Catheter (Figs. 1, 2; available at https://cua.guide/).
Results: In all four patients, endoscopic–guided retrograde upper pole access with the Lawson catheter in the prone split–leg position was successful (Table 1; available at https://cua.guide/). A single complication occurred (Clavein 3B) that required stent exchange due to stent occlusion from clot obstruction and urinoma formation with elevated creatinine of 5.1, however, with no change in hemoglobin or signs of bleeding. The mean preoperative stone volume was 1840 mm^3 (924–3038) with a density of 872 Hounsfield units (400–1111). The mean ureteral injury PULS score was 0.75 (0–2). Fluoroscopy time was 162.3 seconds (51–283). The absolute stone volume reduction was 1826 mm^3 (99%). Complete stone–free rate by postoperative Day 1 computed tomography scan was 25%, and 100% for stones less than 4 mm.
Conclusions: In this very limited initial experience, endoscopic–guided retrograde upper pole access for PCNL can be established efficiently with our modified Lawson technique in the prone split–leg position.

UP–4.4

Impact of percutaneous nephrolithotomy on renal function

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Introduction: Percutaneous nephrolithotomy (PCNL) remains the gold standard surgical intervention for the treatment of large–volume renal stones, including staghorn calculi. Since it involves traversing the renal parenchyma with a tract that ranges in circumference from 16 F to 30 F, there is always some degree of renal injury. We sought to examine the impact of PCNL on renal function and complications in patients with normal and reduced renal function.
Methods: We retrospectively analyzed all consecutive tubeless PCNLs performed at our institution between 2012 and 2017 that had a creatinine and estimated glomerular filtration rate (eGFR) measurement pre– and post–procedure and a followup visit at our centre. Data was collected on patient and stone characteristics, and patients were divided in two groups based on their preoperative eGFR (Group 1: eGFR <50 ml/min, Group 2: eGFR ≥50 ml/min).
Results: A total of 220 patients were included in the study: 25 (11.4%) in Group 1 (mean creatinine 168.4 µmol/L±59.2) and 195 (88.6%) in Group 2 (mean creatinine 80.5 µmol/L±19.5). There were no differences in gender, stone side, stone area and composition, but patients in Group 1 were older (66.6 years±10.8 vs. 54.1±13.3; p≤0.001) and had a lower body mass index (BMI) (26.4±3.7 vs. 29.0±5.9; p=0.031). Patients with eGFR <50 were more likely to have a preoperative nephrostomy tube (NT) or stent (32% vs. 10.3%; p=0.002) and more likely to require multiple tracts (16% vs. 3.6%; p=0.007). Patients with eGFR <50 did not have more postoperative complications (12% vs. 15.9%; NS). Creatinine values changed only marginally postoperatively, but less so in patients with preoperative eGFR<50 (mean increase in creatinine 1.8%±20.1 vs. –10.1%±19.2; p=0.043).
Conclusions: Patients with baseline reduced renal function often have more complex and obstructing stone disease, requiring more preoperative drainage tubes and greater need for multiple tracts. Despite this, PCNL can be performed safely, with no increase in complications and minimal negative impact on renal function acutely.

Poster Session 5: Other Oncology I
June 25, 2018; 0800–0930

MP–5.1
Determinants of postoperative hospital stays in a cohort of bladder cancer patients undergoing radical cystectomy in Quebec, 2000–2013

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Introduction: Radical cystectomy (RC) has been the standard of care for muscle–invasive bladder cancer (BCa) patients for decades. Prolonged hospital stays occur frequently after RC, increasing costs and decreasing quality of life. We evaluated determinants of postoperative hospital stays in BCa patients.

Methods: We used data from two cohorts of RC–treated BCa patients in Quebec, collected from provincial health administrative databases (cohort A: January 2000 to September 2009; cohort B: October 2009 to December 2013). Outcomes were time to hospital discharge after RC, number of days in hospital within 30/90/365 days after RC, and hospital readmission rates. Covariates studied were age, sex, hospital size (by number of beds), surgeons' and hospitals' annual RC load, and distance to the hospital. Linear regression and Cox proportional hazards models were used for statistical analyses.

Results: The cohort included 3975 BCa patients, most were aged 60–80 (69.0%) and male (75.4%). On average, patients spent 16 days in the hospital in the 90 days following surgery; this was least in patients who were younger (–1.3 days per five–year decrement), male (–1.9 days), or treated in centres with high annual RC volumes (–1.0 days per 10 RC/year increment). These determinants, and more recent surgery, predicted the time in hospital in the 30/365 days after RC too. Adjusting for age and sex, patients treated after September 2009 were discharged more quickly post–RC (hazard ratio [HR] 1.10; p=0.005), while readmission rates were similar (HR 1.03; p=0.467). One cause for this improvement was an increased number of RCs in centres with high annual RC volumes (age– and sex–adjusted HR for discharge 1.04; p<0.001; HR for readmission 0.99; p=0.476). Distance to the hospital did not predict hospital stay duration (p≥0.12).

Conclusions: Hospital stay durations after RC have decreased over time, while readmission rates remained stable. Limiting RCs to specialized centres may further decrease postoperative hospital stays.

MP–5.2
Spinal anesthesia is associated with lower recurrence rates after resection of non–muscle–invasive bladder cancer

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Introduction: There is increasing evidence that use of spinal anesthetic (SA) compared to general anesthetic (GA) may lead to improved oncological outcomes by minimizing use of volatile anesthetics and opioids, which are associated with perioperative immunosuppression and increased tumour seeding. The aim of our study was to determine if anesthetic type would influence our primary outcome of cancer recurrence following transurethral resection of bladder tumours (TURBT).

Methods: This observational, retrospective study enrolled 231 patients who underwent TURBT for non–muscle–invasive bladder cancer (NMIBC) at a single centre between 1996 and 2014. Chi–square tests, Kaplan–Meier estimates, logistic regression, and Cox proportional hazard models were used to explore the association between anesthetic type and each of cancer recurrence, cancer progression, and mortality.

Results: In univariable analysis, patients under SA (n=135) had a longer median time to recurrence (42.1 vs. 17.2 months; p=0.014) compared to those who had GA (n=96) (Fig. 1; available at https://cua.guide/). In multivariable analyses, incorporating key a priori variables, including cancer risk (amalgam of stage, grade, presence of carcinoma in situ, number and size of tumours), perioperative chemotherapy, and adjuvant immunotherapy, patients under GA had a higher incidence of recurrence (odds ratio 2.062; 95% confidence interval [CI] 1.14–3.74; p=0.017) and earlier time to recurrence (hazard ratio 1.57; 95% CI 1.13–2.1; p=0.008) compared to patients under SA. Anesthetic type was not associated with cancer progression or overall mortality.

Conclusions: Patients receiving a GA had higher incidence of recurrence and earlier time to recurrence following TURBT for NMIBC compared to patients undergoing SA. These findings should prompt large–scale, prospective studies to further delineate this association.

MP–5.3
Trends and disparities in the use of neoadjuvant chemotherapy for muscle–invasive urothelial carcinoma

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Introduction: Neoadjuvant chemotherapy (NAC) prior to radical or partial cystectomy is considered the standard of care for eligible patients with muscle–invasive urothelial carcinoma (MIBC). Despite guideline recommendations, widespread adoption of NAC has historically been low, although prior studies have suggested that use is increasing. In this contemporary study, we examine whether the use of NAC has continued to increase with time and we explore factors associated with the receipt of NAC.

Methods: We identified all patients included in the National Cancer Database who underwent radical or partial cystectomy for cT2–CT4N0M0 urothelial carcinoma from 2006–2014. The proportion of patients receiving NAC during each year was examined. Logistic regression models were used to evaluate clinical and socioeconomic factors associated with the receipt of NAC.

Results: There were 18 188 patients identified who underwent RC or PC for MIBC. Overall, 3940 (21.7%) received NAC. There was a significant increase in the use of NAC over time, from 9.7% in 2006 to 32.2% in 2014 (Fig. 1; available at https://cua.guide/). Factors associated with lower use of NAC include older age, increased number of comorbidities, lower cT stage, lower hospital RC volume, treatment at a non–academic facility, lower patient income, and receipt of partial cystectomy (all p<0.01). Neither patient sex nor race were associated with the receipt of NAC.

Conclusions: Use of NAC for patients with MIBC has increased significantly over time. However, significant disparities exist in the receipt of NAC and future efforts aimed at mitigating these disparities are warranted. Improved risk stratification to identify high–risk individuals is one strategy that might increase the use of NAC.

MP–5.4

Between–surgeon variation in outcomes of radical cystectomy for bladder cancer in a universal healthcare system

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Introduction: Radical cystectomy for bladder cancer is a complex surgical oncology procedure. It is plausible that outcomes may vary among individual surgeons. We determined whether between–surgeon variation, known as heterogeneity, exists for urologic surgeons practicing at a Canadian academic centre in a universal healthcare system.

Methods: A retrospective analysis of data from the University of Alberta (UA) Radical Cystectomy Database was performed. Between September 1994 and September 2017, 1031 consecutive patients underwent curative–intent radical cystectomy for histologically proven urothelial carcinoma of the bladder (cTanyN1–3M0) by one of 10 urologic surgeons. Outcomes were 90–day mortality rate, positive surgical margin (R1) resection rate, total number of lymph nodes evaluated, and 90–day blood product transfusion rate. Multivariable random effects models were used to evaluate heterogeneity in outcomes after adjustment for case mix. Statistical tests were two–sided ($p \leq 0.05$).

Results: Data were evaluable for 1031 patients. There was significant between–surgeon variation in 90–day mortality rate ($p=0.001$), R1 resection rate ($p=0.018$), total number of lymph nodes evaluated ($p<0.001$), and 90–day blood product transfusion rate ($p<0.001$). Four surgeons had adjusted 90–day mortality rates ≤3%, whereas eight surgeons had adjusted 90–day mortality rates ≥8%. Two surgeons had adjusted R1 resection rates ≤6%, whereas four surgeons had adjusted R1 resection rates ≥10%. Two surgeons had ≥18 lymph–nodes evaluated, whereas four surgeons had ≤10 lymph–nodes evaluated. Two surgeons had blood product transfusion rate of <20%, whereas three surgeons had blood product transfusion rate of >50%.

Conclusions: A patient's likelihood of achieving optimal clinical outcomes differs depending on which urologic surgeon performs his/her radical cystectomy. Research examining the mechanism(s) underlying surgical heterogeneity in outcomes of radical cystectomy is needed.

MP–5.5

Pathological response rates and survival in patients with radical cystectomy and methotrexate/vinblastine/doxorubicin/cisplatin (MVAC) neoadjuvant chemotherapy for muscle–invasive bladder cancer

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Introduction: Randomized controlled trials that supported methotrexate/vinblastine/doxorubicin/cisplatin (MVAC) as a neoadjuvant chemotherapy regimen in muscle–invasive bladder cancer (MIBC) report a complete response (CR) rate as high as 38% at radical cystectomy (RC).[1–4] In the past decade, different studies have reported lower CR rates in the MVAC regimen in real–life practice.[5–7] The purpose of this study was to determine CR and partial response (PR) rates, as well as survival outcomes, in patients treated with neoadjuvant MVAC at our centre.

Methods: We retrospectively reviewed 41 patients with urothelial MIBC who underwent neoadjuvant MVAC and RC at the Hôtel–Dieu de Québec Hospital between 2012 and 2017. Median age was 66.2 years and 30 patients were male. Twenty–three patients had cT2, 12 had cT3, and six had cT4 disease, while 21 had clinically negative lymph nodes (cN0) and 20 had cN+. Primary outcomes were rates of pathological CR, defined as pT0N0M0, and PR, defined as ≤pT1N0 (pT1/Tis/Ta/ T0). Secondary outcomes were disease–free survival (DFS), cancer–specific mortality (CSM), and overall mortality (OM).

Results: Median followup time was 10.5 months. CR was 19.5% (n=8) and PR was 31.7% (n=13). Most (n=7, 87.5%) patients with CR were cT2. Patients with PR were mostly cT2, (n=10, 76.9%) and less frequently cT3 (n=3, 23.1%) ($p=0.4630$). The majority (n=11, 84.6%) of them were cN0 and 15.4% cN+ (n=2) ($p=0.0063$). Overall, 41.5% (n=17) patients had recurrent disease. CSM and OM was 26.8% (n=11), with a median DFS of 7.6 months and a median 10.5–month survival. Of the 30 survivors, 20% (n=6) live with recurrent disease (DFS 12.9 months).

Conclusions: We report a 19.5% CR rate and a 31.7% PR rate in neoadjuvant MVAC for MIBC. Moreover, we report an increased PR rate in patients with preoperative cN0. Our data support growing evidence of lower CR rates to neoadjuvant MVAC observed in retrospective studies compared to previous randomized controlled trials.

References:

1. Grossman HB, Natale RB, Tangen CM, et al. Neoadjuvant chemotherapy plus cystectomy compared with cystectomy alone for locally advanced bladder cancer. *N Engl J Med* 2003;349:859–66. https://doi.org/10.1056/NEJMoa022148
2. International collaboration of trialists. Neoadjuvant cisplatin, methotrexate, and vinblastine chemotherapy for muscle–invasive bladder cancer: A randomized controlled trial. *Lancet* 1999;354:533–40. https://doi.org/10.1016/S0140–6736(99)02292–8
3. Sagaster P, Flamm J, Flamm M, et al. Neoadjuvant chemotherapy (MVAC) in locally invasive bladder cancer. *Eur J Cancer* 1996;32A:1320–4. Lee FC, Harris W, Cheng HH, et al. Pathologic response rates of gemcitabine/cisplatin vs. methotrexate/vinblastine/adriamycin/cisplatin neoadjuvant chemotherapy for muscle–invasive urothelial bladder cancer. *Adv Urol* 2013;317190.
4. Lee FC, Harris W, Cheng HH, et al. Pathologic response rates of gemcitabine/cisplatin vs. methotrexate/vinblastine/adriamycin/cisplatin neoadjuvant chemotherapy for muscle–invasive urothelial bladder cancer. *Adv Urol* 2013;317190.
5. Sternberg CN, de Mulder PH, Schornagel JH, et al. Randomized phase 3 trial of high–dose–intensity methotrexate, vinblastine, doxorubicin, and cisplatin (MVAC) chemotherapy and recombinant human granulocyte colony–stimulating factor vs. classic MVAC in advanced urothelial tract tumours: European Organization for Research and Treatment of Cancer Protocol no. 30924. *J Clin Oncol* 2001;19:2638–46. https://doi.org/10.1200/JCO.2001.19.10.2638
6. Zargar H, Espiritu PN, Fairey AS, et al. Multicentre assessment of neoadjuvant chemotherapy for muscle–invasive bladder cancer. *Eur Urol* 2015;67:241–9. https://doi.org/10.1016/j.eururo.2014.09.007
7. Fairey AS, Daneshmand S, Quinn D, et al. Neoadjuvant chemotherapy with gemcitabine/cisplatin vs. methotrexate/vinblastine/doxorubicin/cisplatin for muscle–invasive urothelial carcinoma of the bladder: A retrospective analysis from the University of Southern California. *Urol Oncol* 2013;31:1737–43. https://doi.org/10.1016/j.urolonc.2012.07.005

MP–5.6

A population–based study demonstrating passive centralization of radical cystectomy: Potential associations with other quality indicators

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Introduction: Consolidating complex surgical procedures to higher–volume centres has been demonstrated to lead to enhanced processes of care and patient outcomes. In England, centralization of radical cystectomies (RC) was mandated in 2003, with recent documentation of improved early outcomes. Although not mandated in Canada, we hypothesize that centralization of RC has occurred passively. In this study, we explore passive centralization of care and whether it is associated with other process–related quality indicators and outcomes.

Methods: Electronic records of treatment were linked to the population–based Ontario Cancer Registry to identify all patients who underwent RC for bladder cancer from 1994–2013. Patients were classified in two temporal cohorts: a historic cohort with RC in 1994–2008, and a more contemporary cohort with RC in 2009–2013. The primary objective was to describe mean annual surgeon and hospital RC volume. Secondary

objectives included process and outcome measures, such as referral patterns to medical oncology (MO), receipt of perioperative chemotherapy, and postoperative mortality.
Results: A total of 5582 RCs were completed in Ontario over the study period: 3879 (69%) in 1994–2008 and 1703 (31%) in 2009–2013. The mean annual surgeon volume and hospital volume of RC during 1994–2008 was 4.17 (95% confidence interval [CI] 3.36–4.98) and 11.33 (95% CI 9.44–13.22), respectively. In the more contemporary era, these volumes significantly increased to 6.80 (95% CI 6.47–7.33) and 16.40 (95% CI 15.39–17.40) (p<0.01) (Fig. 1; available at https://cua.guide/). Preoperative MO referral increased from 11% in 1994–2008 to 32% in 2009–2013 (p<0.01). Use of neoadjuvant chemotherapy increased substantially from 4% in 1994–2008 to 19% in 2009–2013 (p<0.001). There was a trend towards decreased 90–day postoperative mortality: 7.59% in 2009–2013 vs. 8.27% in 1994–2008.
Conclusions: These data illustrate passive consolidation of cystectomy to higher–volume providers in Ontario. During the same time period, there has been improvements in other processes of care. Further work is required to determine the potential effects of centralization on other process–related quality indicators and patient outcomes

MP–5.7

Postoperative ileus and complications outcomes in the enhanced recovery protocol after radical cystectomy for bladder cancer

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Introduction: Radical cystectomy (RC) is associated with high morbidity rates.[1,2] Enhanced Recovery After Surgery (ERAS) programs standardize and decrease length of stay (LOS), postoperative ileus (POI), pain, and readmissions in colorectal surgery.[3–5] ERAS protocols allow fluid and carbohydrate loading up to two hours preoperatively and encourage early oral postoperative nutrition. In RC, ERAS protocols are accepted mostly based on the favourable results observed in colorectal surgery.[6] Our study aims to assess POI, oral feeding, and complication outcomes between an ERAS protocol and the traditional management after RC.
Methods: We retrospectively reviewed 40 patients who underwent RC under an ERAS protocol and 40 patients under conservative management (control group) at the Hôtel–Dieu de Québec between 2016 and 2017. Data was analyzed using GraphPad Prism 7 software. Nasogastric tube (NGT) use, total parental nutrition (TPN) use, LOS, and complications were compared between the two protocols.
Results: POI rates were higher in the ERAS group compared to the control group (57.5 vs. 47.5%). Slightly more patients underwent NGT installation in the ERAS group (52.5%) compared to the control group (45%; p=0.6549). Early installation of NGT was more frequent in the ERAS group (12.5 vs. 0% one day post–RC). Use of TPN was less frequent in the ERAS group compared to the control (27.5 vs. 37.5%; p=0.4743). However, median TPN duration was greater in the ERAS group compared to the control (13 vs. 6 days). Within a week from RC, 65% of ERAS patients tolerated oral nutrition compared to 52.5% control patients (p=0.4978). Median LOS was identical in both groups (11 days). Complication and readmission rates were similar in both groups.
Conclusions: This study does not support significant improvements in outcomes in patients under ERAS protocols for RC. Further multicentre studies are warranted to clarify this observation and to improve postoperative management of RC patients.
References:
1. Roth B, Birkhauser FD, Zehnder, P, et al. Parenteral nutrition does not improve postoperative recovery from radical cystectomy: Results of a prospective randomized trial. *Eur Urol* 2013;63:475–82. https://doi.org/10.1016/j.eururo.2012.05.052
2. Shabsigh A, Korets R, Vora K, et al. Defining early morbidity of radical cystectomy for patients with bladder cancer using a standardized reporting methodology. *Eur Urol* 2009;55:164–74. https://doi.org/10.1016/j.eururo.2008.07.031
3. Fearon KC, Ljungqvist O, Von Meyenfeldt M, et al. Enhanced recovery after surgery: A consensus review of clinical care for patients undergoing colonic resection. *Clin Nutr* 2005;24:466–77. https://doi.org/10.1016/j.clnu.2005.02.002
4. Lemanu DP, Singh PP, Stowers MD, et al. A systematic review to assess cost effectiveness of enhanced recovery after surgery programmes in colorectal surgery. *Colorectal Dis* 2014;16:338–46. https://doi.org/10.1111/codi.12505
5. Sarin A, Litonius ES, Naidu, R, et al. Successful implementation of an Enhanced Recovery After Surgery program shortens length of stay and improves postoperative pain, and bowel and bladder function after colorectal surgery. *BMC Anesthesiol* 2016;16:55. https://doi.org/10.1186/s12871–016–0223–0
6. Patel HR, Cerantola Y, Valerio M, et al. Enhanced recovery after surgery: are we ready, and can we afford not to implement these pathways for patients undergoing radical cystectomy? *Eur Urol* 2014;65:263–6. https://doi.org/10.1016/j.eururo.2013.10.011

MP–5.8

Do men with prior military service have an increased risk for genitourinary cancers? Results from the HINTS national database

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Introduction: Small series have demonstrated that the incidence of select malignancies are higher among military personnel than the non–military population. Using a national survey database, we assess whether any history of military service among men was associated with an increased incidence of cancers in general and genitourinary (GU) cancers specifically.
Methods: This was a cross–sectional study, using the Health Information National Trends Survey (HINTS, 4th Ed.), a population–based survey of people living in the U.S. during the years 2011–2014. Eligible individuals were men aged 18 and above, who were stratified according to their military service history into the following categories: current active duty, active duty in the last 12 months, active duty >12 months ago, Reserve or National Guard duty only, and no military history. Multivariable logistic regression analysis was performed to assess for predictors of GU cancers.
Results: A total of 4715 men aged 18 and above were included in the study. Table 1 (available at https://cua.guide/) demonstrates the demographic characteristics of all patients. Mean age was significantly higher in men with military history (MMH), with a resulting higher proportion of retired men. Fig. 1 (available at https://cua.guide/) demonstrates that among MMH, there is significant higher rate of cancer in general and GU cancers specifically, mainly driven by a higher incidence of prostate cancer. MMH were also demonstrated to have a higher rate of additional cancer, aside from GU cancer. On multivariable analysis, age, black race, being retired, and having a history of military service were all predictors of GU cancers (Table 2; available at https://cua.guide/).
Conclusions: Despite an obvious selection bias, this hypothesis–generating study suggest that a history of U.S. military service seems to be associated with a higher incidence of GU cancers among men in the HINTS database, mainly driven by prostate cancer. Further studies are needed to elucidate the correlation between cancer and any kind of previous military service.

MP–5.9

Morphological subtyping as a prognostic predictor for survival in papillary renal cell carcinoma: Type 1 vs. type 2

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Introduction: Papillary renal cell carcinoma (pRCC) is the second most common RCC and is subclassified into type 1 and 2. The independent prognostic value of pRCC subtype remains controversial. The present study evaluated cancer–related outcomes of patients with clinically localized pRCC who are treated with radical or partial nephrectomy.

Methods: This is a nested cohort of the prospective Canadian Kidney Cancer information system database from 16 institutions between 2011 and 2017. Patient, diagnosis, treatment, and survival characteristics were compared between pRCC type 1 and 2 cohorts.

Results: During the study period, 607 patients had clinically localized pRCC type 1 (n=383) or type 2 (n=224) histology. Age, sex, race, and comorbidities were balanced between groups. Pathological stage (pT3 or 4) and Fuhrman's nuclear grade (3 or 4) were significantly higher in the type 2 pRCC cohort (p<0.0001). pRCC type 2 tumours were significantly larger compared to type 1 (4.0 cm [interquartile range (IQR) 2.7–6.0) vs. 3.5 cm [IQR 2.2–5.0]; p=0.002), although size was not an independent predictor of subtype (p=0.84). A greater proportion of type 2 pRCC patients received radical nephrectomy (46.9% vs. 26.4%; p<0.0001). Significantly more type 2 pRCC patients underwent lymph node dissection (LND) (31.7% vs. 17.1%; p<0.0001) and had more pathologically positive nodes (27.5% vs. 4.7%; p=0.0004). Overall, type 2 pRCC had worse cancer outcomes compared to type 1, as demonstrated by elevated all–cause mortality (hazard ratio [HR] 4.76; 95% confidence interval [CI] 2.40–9.41; p<0.0001) and worse progression–free survival (HR 5.92; 95% CI 3.34–10.51; p<0.0001) (Fig. 1; available at https://cua.guide/). After surgery, patients with type 2 pRCC were more commonly treated with systemic therapy (11.2% vs. 0.8%) or radiation to metastases (5.8% vs. 0%) (p<0.0001). At last followup, significantly more type 2 patients developed metastatic disease (18% vs. 2%; p<0.0001).

Conclusions: This is the largest cohort study comparing pRCC subtypes. Clinically localized type 2 pRCC is associated with unfavourable prognosis.

MP–5.10

Differences between patients with de novo vs. secondary upper tract urothelial carcinoma: The Princess Margaret Cancer Centre experience

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Introduction: Upper tract urothelial carcinoma (UTUC) accounts for <5% of all urothelial cancers (UC). It is usually considered a part of the spectrum of UC, manifesting as bladder cancer (BCa) primarily. Our objective was to find whether there are clinical differences between UTUC tumours that present de novo (DnUTUC) and those that present secondarily (SUTUC) (i.e., having had a prior history of BCa).

Methods: The Princess Margaret Cancer Centre institutional database was queried for all UTUC patients between 2002 and 2016. Data collected included clinical, pathological, and followup parameters. Patients were stratified according to whether their disease was DnUTUC or SUTUC. Survival outcomes were compared and multivariate logistic regression analysis was performed to predict covariates associated with recurrence.

Results: A total of 128 UTUC patients were found, 98 with DnUTUC (76.5%) and 30 with SUTUC (23.5%). Mean age and the number of males were similar (70.5 vs. 69.1; p=0.548, and 83.3% vs. 70.4%; p=0.161, for DnUTUC vs. SUTUC, respectively). However, DnUTUC patients had a lower age–adjusted Charlson score (6.4 vs. 7.5; p=0.039). In both groups, 70% of patients had high–grade (HG) disease, more than 43% had Ta disease, and more than 37% had T2 and above disease. Interestingly, carcinoma in situ (CIS) and recurrence rates were much higher in SUTUC than in DnUTUC (56.7% vs. 25.5%; p=0.001, and 70.4% vs. 39.8%; p=0.005, respectively). Treatment strategy was similar, with more than 80% undergoing nephroureterectomy in both groups. Cancer–specific survival (CSS) was significantly better in DnUTUC, with 11.5% vs. 32.1% dying of their disease (p=0.058). Multivariable logistic regression analysis demonstrated that male gender and SUTUC disease significantly predicted recurrence.

Conclusions: In this single–centre experience spanning more than a decade, DnUTUC disease has been shown to be the more common UTUC variant, with the majority of patients having HG disease. In this specific entity, CIS and recurrence rates are significantly lower and survival rates are considerably better when compared to SUTUC. These findings raise the question whether followup strategies for recurrence should differ between DnUTUC and SUTUC.

MP–5.11

Diabetes and kidney cancer survival in patients undergoing nephrectomy: A Canadian multicentre, propensity score analysis

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Introduction: Diabetes has been associated with an adverse prognosis in various malignancies; however, there are conflicting data in kidney cancer. Furthermore, it has been shown that diabetics tend to receive less aggressive cancer treatment. Determining whether diabetes is associated with survival in kidney cancer may help guide treatment in a comorbid patient population.

Methods: We used the Canadian Kidney Cancer Information System database to identify patients undergoing a nephrectomy from 1989–2017 for M0 renal cell carcinoma at 16 institutions across Canada. We derived inverse probability of treatment weights (IPTW) from a propensity score model based on various clinical, surgical, and pathological characteristics. We used Cox proportional hazard models to evaluate the association between diabetes and cancer–specific and overall survival, in the sample weighted by the IPTW.

Results: We identified 4828 patients that met inclusion criteria, of whom 948 (19.6%) were diabetic. Median followup in those without death was 26.6 months (interquartile range [IQR] 9.7–53.8). There were 901 deaths from any cause and 299 deaths from kidney cancer. Before propensity score methods, diabetics were older, more likely to have a history of concomitant comorbidities, and more likely to have clear–cell renal cell carcinoma. After propensity score methods, all characteristics were balanced between groups (standardized difference <0.10). IPTW–adjusted Cox proportional hazard models demonstrated no significant association between diabetes and cancer–specific (hazard ratio [HR] 1.05; 95% confidence interval [CI] 0.77–1.45), or overall survival (HR 1.09; 95% CI 0.91–1.31).

Conclusions: Our multicentre study found that diabetes was not significantly associated with cancer–specific or overall survival in kidney cancer patients undergoing nephrectomy. These findings do not support altering treatment approach or followup strategies in diabetic patients.

MP–5.12

Surveillance guidelines based on recurrence patterns for upper tract urothelial carcinoma

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Introduction: Evidence to guide postoperative surveillance of upper tract urothelial carcinoma (UTUC) is lacking. Here, we developed a postradical nephroureterectomy (RNU) surveillance protocol based on recurrence patterns in a large, multi–institutional cohort of patients.

Methods: Clinical and pathological data were collected retrospectively from 1029 patients undergoing RNU over a 15–year period (1994–2009) at 10 Canadian academic institutions. A multivariable model was used to identify prognostic clinico–pathological factors, which were then used to define risk categories. Risk–based surveillance guidelines were proposed based on actual recurrence patterns.

Results: Overall, 555 (49.9%) patients developed recurrence, including 289 (25.9%) urothelial recurrences and 266 (23.9%) loco–regional and distant recurrences. On multivariable analysis, age, female gender, tumour multifocality, positive surgical margins, and presence of lymphovascular invasion (LVI) were significant predictors of urothelial recurrence while female gender, ≥pT2, pN+, high tumour grade, tumour multifocality, and LVI were significant predictors of loco–regional and distant recurrence. Three risk groups were identified: 1) low–risk patients with pTa–T1, pN0 disease and no adverse histological features (high tumour grade, LVI, tumour multifocality); 2) intermediate–risk patients with pTa–T1, pN0 disease with one or more of the adverse histological features; and 3) high–risk patients with either a ≥pT2 tumour and/or nodal involvement. Low–, intermediate–, and high–risk patients had a five–year survival rate of 0.59, 0.47, and 0.34, respectively. The risks of loco–regional and distant recurrences and time to death (both $p<0.0001$) were significantly different between the low–, intermediate–, and high–risk patients. Using this data, we propose a surveillance protocol outlined in Table 1 (available at https://cua.guide/).

Conclusions: Based on recurrence patterns in each risk group, we have proposed an evidence–based, risk–adapted post–RNU surveillance protocol.

UP–5.1

Development of a patient decision aid for urinary diversion following radical cystectomy

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Introduction: Patient decision aids are evidence–based clinical tools that facilitate shared decision–making. Decision aids present therapeutic options, including data on benefits and harms, and help patients clarify their preferences. In urology, one of the most life–altering choices faced by patients is the selection of urinary diversion following radical cystectomy. We sought to develop and evaluate a decision aid to address this decision.

Methods: The International Patient Decision Aids Standards (IPDAS) and the Ottawa Decision Support Framework were used to guide the systematic development of the decision aid. A review of the literature was performed for urinary diversion options following radical cystectomy. The content of the decision aid was agreed upon by content and methodological experts using an iterative feedback process. A survey was created to assess the content and clarity of the patient decision aid. The primary outcome was patient and clinician acceptability of the decision aid.

Results: An evidence–based patient decision aid presented evidence on options, including probabilities of benefits and harms. Ileal conduit and orthotopic neobladder were the urinary diversion options that were most cited. The included outcomes were: urinary retention, daytime and nighttime incontinence, stoma management, and stoma complications. Simple language and pictures were used to ensure the decision aid was user–friendly for a wide range of patients. A validated screening instrument was included to assess patients' decisional conflict. Knowledge questions were used to verify patients' understanding. The decision aid met all IPDAS criteria to be defined as a decision aid, five of six criteria for certification, and 17 of 23 quality criteria.

Conclusions: A patient decision aid was created to facilitate shared–decision making for patients undergoing urinary diversion following radical cystectomy. The effectiveness of our decision aid is currently being evaluated prospectively.

UP–5.2

Genomic characterization of paired cystectomy and lymph node metastases in bladder urothelial carcinoma

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Study Groups: Funding: Pin Down Bladder Cancer.

Introduction: Multicentre sequencing initiatives show a high proportion of high–grade urothelial cancers (HGUCs) harbour genetic alterations. To identify mechanisms of nodal metastasis, we characterized the alterations within paired radical cystectomy (RC) and concurrent lymph node (LN) metastases.

Methods: Twenty–five HGUCs from 11 patients were sequenced on a IRB–approved protocol using a 230–468 cancer–associated gene panel. A pathologist reviewed H&E slides to confirm grade, stage, and histology. Genetic alterations were identified and predicted or established oncogenic driver alterations were identified by the OncoKB database.

Results: Paired RC and LN metastases were sequenced from nine patients, including three with paired discrete LNs. Two patients who were pT0 at RC had paired LNs sequenced. Median age was 67.3 (range 45.0–86.3), tumours were HGUC, and pathological stage at RC was pT0–T4, N1–3. An average 16.1 alterations were identified per patient; of these, 6.4 were predicted to be oncogenic across 37 discrete genes within the cohort. These include similar rates in genes identified by the TCGA cohort; TP53 (12/25, 48% of samples), FGFR3 (5/25, 20%), PIK3CA (4/25, 16%), and RB1 (4/25, 16%). There was low concordance between the alterations in the RC samples and paired LN metastases (50.7% overall, 59.5% oncogenic drivers), with an overall average of 10.1 total and 4.2 oncogenic driver alterations in the cystectomies and 13.6 total and 5.7 drivers in the nodal metastases. Conversely, the genetic alterations were highly concordant between paired nodal samples in the five patients with multiple nodes sequenced (89.5% overall, 92.7% oncogenic drivers) .

Conclusions: LN metastases harbour discrete genetic alterations when compared to the primary tumour in patients undergoing RC for HGUC. Conversely, alterations are highly concordant between discrete nodal metastases within the same anatomical region, indicating that a subset of cell clones migrate from the primary tumour to form LN metastases.

UP–5.3

Prospective evaluation of the surgical learning curve of radical cystectomy and urinary diversion for bladder cancer

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Introduction: Radical cystectomy (RC) and urinary diversion for bladder cancer is a complex oncology procedure that may have a substantial learning curve. We used individual patient data from surgeons at a single academic centre to examine the association between surgeon experience performing RC for bladder cancer and clinical outcomes.

Methods: Our prospective analysis included 274 patients with cTanyN––3M0 bladder cancer who were treated with curative intent RC by one of two urologic oncologists at a single centre between 2007 and 2016. Standardized followup included renal ultrasound and function assessment 4–6 weeks following stent removal, as well as risk–adapted surveillance with clinical assessment, blood chemistry, and computed tomography. For each patient, surgeon experience was coded as the total number of RC procedures performed by the surgeon prior to that patient's operation. Outcomes were overall survival (OS) and benign uretero–ileal anastomotic stricture (BUIS). Multivariable survival time regression models were used to evaluate the association between surgeon experience and outcomes with adjustment for case mix. Statistical tests were two–sided ($p \leq 0.05$).

Results: Complete data were evaluable for 274 patients. The median followup was 20 months (range 0–110). The predicted two–year OS and freedom from BUIS rates were 70% and 95%, respectively. Multivariable analysis showed that surgeon experience was not significantly associated with OS (hazard ratio [HR] 0.997; p=0.18) or BUIS (HR 1.003; p=0.60). The predicted probabilities of OS and BUIS at two years did not differ for patients treated by a surgeon with 10 prior operations or with 100 prior operations.

Conclusions: This analysis of individual patient data from two urologic oncologists showed that rates of OS and BUIS after RC for bladder cancer were stable and there was no evidence of a surgical learning curve, presumably due to stable patient selection and surgical technique following completion of fellowship training.

UP–5.4

Does partial nephrectomy for biopsy–proven Grade 3/4 renal cell carcinoma confer worse outcomes compared to radical nephrectomy? Results from a Canadian multicentre cohort

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Study Groups: Multicenter Canadian Kidney Cancer information system (CKCis).

Introduction: To date, there is no evidence for the superiority of radical nephrectomy (RN) compared to partial nephrectomy (PN) for non–metastatic, high–grade (3–4) renal cell carcinoma (RCC). In this study, we compared results of treatment with PN or RN.

Methods: From 2006–2017, 2844 records of patients who had undergone a biopsy for a suspicious renal mass from the multicentre Canadian Kidney Cancer information system (CKCis) were reviewed. A total of 76 patients were found to have a biopsy–proven Grade 3–4 RCC, and later underwent surgery by PN or RN. Clinical, surgical, and pathological parameters were compared. Univariable and multivariable logistic regression analysis (MLRA) predicting PN was performed, after adjusting for pertinent variables.

Results: No neo– or adjuvant therapy was used. Table 1 (available at https://cua.guide/) records the preoperative clinical characteristics and shows a higher T3/T4 stage and Grade 4 rate among RN patients. Postoperative data (Table 2; available at https://cua.guide/) shows higher stage and grade, and worse outcomes for RN. When stratifying outcomes by tumour size <7 cm, none of the PN patients died, but 2/25 (8%) of the RN patients died of disease. Furthermore, in patients with postoperative FG 3–4, 30% of RN compared to 12% of PN developed metastasis (p=0.1) and 19% of RN compared to none of the PN patients died of disease (p=0.035). MLRA (Table 3; available at https://cua.guide/) showed that Grade 4 compared to Grade 3 (odds ratio [OR] 0.093; 95% confidence interval [CI] 0.01–0.871; p=0.0375), and T3/T4 compared to T1 disease (OR 0.09; 95% CI 0.0092–0.8961; p=0.04) significantly predict a lower OR for undergoing PN.

Conclusions: Although RN patients had worse disease, sensitivity analyses of patients with postoperative Grade 3–4 or tumour size <7 cm, did not show worse outcomes for PN. Despite the small, multicentre cohort and an inherent selection bias, PN does not appear to confer worse outcomes for biopsy–proven Grade 3–4 RCC. Larger cohorts are required to demonstrate that PN should be attempted whenever feasible, even for high–grade RCC disease.

UP–5.5

Comorbidity status independently predicts overall survival after radical nephroureterectomy for upper tract urothelial carcinoma

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Introduction: Radical nephroureterectomy (RNU) ± regional lymph node dissection is a standard of care treatment for upper tract urothelial carcinoma (UTUC). Independent predictors of survival after RNU are pathological TNM stage, lymphovascular invasion (LVI), and World Health Organization (WHO) grade. Comorbidity status has previously been shown to not be an independent predictor of survival. The objective of the current study was to re–examine the association between comorbidity status and survival after RNU for UTUC.

Methods: A retrospective analysis of data from the University of Alberta (UA) Radical Nephroureterectomy Database was performed. Between April 1994 and August 2017, 255 consecutive patients underwent RNU ± regional lymph node dissection for UTUC at two academic teaching hospitals. Comorbidity status was obtained through a medical record review and classified using the Charleson Comorbidity Scale (CCS). The main outcome was overall survival (OS). The Kaplan–Meier method and Cox proportional regression models were used to analyze survival data. Statistical tests were two–sided ($p \leq 0.05$).

Results: Data were evaluable for 255 patients. The median followup duration was 52.4 months. The median age was 71 years (interquartile range [IQR] 34–89) and 157 patients (61%) were male. Thirty–five (13%) and 220 (87%) patients had CCS <2 and CCS ≥2 comorbidity, respectively. The five–year OS rates for patients with CCS <2 and CCS ≥2 comorbidity were 97% and 67%, respectively (log rank p<0.001). Multivariate Cox regression analyses showed that increased comorbidity was independently associated with worse OS (hazard ratio [HR] 5.7; 95% confidence interval [CI] 2.3 to 14.1; p<0.001).

Conclusions: This is the first study to show comorbidity status, as measured by the CCS, was independently associated with overall survival after RNU for UTUC. Further prospective validation is required. This data has implications for patient counselling and use of CCS as stratification variable in clinical trials.

UP–5.6

Factors associated with early mortality and survival outcomes among patients with testicular neoplasms: A population–level analysis

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Introduction: Despite remarkable survival outcomes for testicular cancer (TCa) patients in the post–chemotherapy (chemo) era, there is a paucity of data assessing factors associated with 'early' mortality after diagnosis. The objectives of this study were to assess predictors of early mortality and factors associated with overall survival (OS).

Methods: Patients with a testicular neoplasm were identified in the Surveillance, Epidemiology, and End Results (SEER) database from 1973–2011 (n=42 004). All patients had at ≥2 years of followup. The primary outcome was mortality within two years of diagnosis. A multivariable log binomial regression model was used to generate prevalence ratios (PR) for predictors of early mortality (≤2 years). A multivariable Cox–proportional hazards model was used to generated hazard ratios (HR) for identifying factors associated with OS.

Results: The mean age was 35.4 years (standard deviation [SD] 12.4) and 92% of patients were white. More than 95% of patients had germ cell tumours (42% non–seminomatous germ cell tumours [NSGCT], 54% seminoma), 35% had radiation (rads), and 30% had chemo. Compared to white patients, black men had a higher likelihood of early mortality (PR 1.96). Men with NSGCT, lymphoma, and variant histology were 1.59, 4.01, and 6.36 times, respectively, more likely to suffer early mortality compared to patients with seminoma. Protective factors for early mortality included: marriage, later year of diagnosis, and surgical management. The model area under the curve was 0.875. Significant predictors for OS were distant disease (HR 4.49), testicular lymphoma (HR 2.32), and variant histology (HR 2.18). Black men also had inferior OS compared to white men (HR 1.55). Rads and chemo as time–varying covariates were not significant in the final model.

Conclusions: Although patients with TCa have excellent long–term survival, there are a subset of patients that suffer mortality within two years of diagnosis. Unmarried and black patients are more likely to suffer early mortality, raising the question of appropriate access to initial and followup care.

Poster Session 6: Reconstruction/Trauma/Transplant
June 25, 2018; 0800–0930

MP–6.1
Multicentre, comparative analysis of transecting and non–transecting anastomotic bulbar urethroplasty techniques

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Introduction: Transecting anastomotic urethroplasty has been the subject of some controversy related to a possible adverse effect on sexual function. Non–transecting variations of anastomotic urethroplasty were created, in part, to address this potential concern. The objective of this multicentre study is to compare outcomes of transecting and non–transecting anastomotic urethroplasty techniques.

Methods: A total of 352 patients with complete followup underwent anastomotic bulbar urethroplasty from September 2003 to March 2017 performed by one of four reconstructive urologists. The primary (objective) outcome was success defined as urethral patency >16 Fr on routine followup cystoscopy. Secondary outcome measures included 90–day complications (Clavien >2) and de novo sexual dysfunction assessed at six months. Comparison between transecting and non–transecting cohorts were made using Cox regression, t–test or Chi–square when appropriate.

Results: Mean stricture length was 1.7±0.8 cm (0.5–5), with a mean age of 44.6 years. The two groups did not differ by age (p=0.44) or stricture length (p=0.49). Overall, there was a 94.9% (n=334) success rate with a mean followup of 64.2 months (6–170). Twenty–five patients (7.1%) experienced a 90–day postoperative complication (Clavien >2) and 41 (11.6%) reported an adverse change in sexual function. When comparing transecting (n=258) and non–transecting (n=94) techniques, there was no difference in success (93.8% vs. 97.9%; p=0.18) and no difference in postoperative complications (8.1% vs. 4.3%; p=0.25). Patients undergoing transecting anastomotic urethroplasty were more likely to report an adverse change in sexual function (14.3%; vs. 4.3%; p=0.008).

Conclusions: Anastomotic urethroplasty remains a highly effective surgery with relatively minimal associated morbidity. Newer, non–transecting anastomotic urethroplasty techniques compare quite favourably to transecting techniques and likely reduce the risk of associated sexual dysfunction.

MP–6.2
Comparing healthcare expenditures in the management of urethral stricture disease in Ontario

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Study Groups: University of Toronto Research Program in Functional Urology, CUA Resident Research Grant.

Introduction: Treatment options for urethral stricture disease (USD) in men include endoscopic management and open surgical correction (urethroplasty). Studies have found repeat endoscopic procedures to be costly, concluding that urethroplasty should be offered after one visual internal urethrotomy (VIU).[1,2] Currently, no studies have looked at costs at the population level. We sought to determine the direct healthcare expenditures for men with USD following either endoscopic treatment only, or one endoscopic treatment with subsequent urethroplasty.

Methods: We performed a population–based, retrospective cohort study using adult men from Ontario, Canada. We identified patients who had undergone endoscopic treatment only (urethral dilation or VIU) or urethroplasty after one endoscopic treatment between January 1, 2003 and December 31, 2016 using administrative databases. Men had to have undergone two or more endoscopic treatments or urethroplasty after one endoscopic procedure. We determined the total, one–year and five–year average, per person healthcare costs in 2016 Canadian dollars using a methodology that calculates patient–level costing from healthcare usage.

Results: In total, 11 893 men underwent at least two endoscopic procedures during the study period; 184 men had a urethroplasty after one endoscopic procedure. The total cost for men who underwent at least two endoscopic procedures was $59 855/person. The year one– and five–year average costs were $16 067/person and $11 101/person, respectively. The total cost for men who underwent urethroplasty after one endoscopic procedure was $45 062/person. The year one and year five average costs were $18 511/person and $3394/person, respectively. Men who underwent a urethroplasty had a total cost savings of $14 793/person.

Conclusions: We found that performing urethroplasty after one failed endoscopic procedure has an average cost savings of almost $15 000/person compared to pure endoscopic management.

References:

1. Wessells H. Cost–effective approach to short bulbar urethral strictures supports single internal urethrotomy before urethroplasty. *J Urol* 2009;181:954–5. https://doi.org/10.1016/j.juro.2009.02.042
2. Wright JL, Wessells H, Nathens AB, et al. What is the most cost–effective treatment for 1–2 cm bulbar urethral strictures: societal approach using decision analysis. *Urology* 2006;67:889–93. https://doi.org/10.1016/j.urology.2005.11.003

MP–6.3
Optimal preoperative staging of penile urethral stricture length: The critical role of pediatric cystoscopy

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Introduction: Accurate staging of penile urethral strictures can be challenging, particularly when the urethral meatus is involved. The aim of this study is to examine the effect of a pediatric cystoscope when used in conjunction with retrograde urethrography to accurately stage penile urethral stricture length prior to urethroplasty.

Methods: We conducted a retrospective review of patients undergoing surgery for penile urethral stricture (with involvement of the meatus) at a single centre from 2004–2016. Patients underwent retrograde urethrography preoperatively with or without the use of an 8 Fr semi–rigid pediatric cystoscope. Outcome measures were discrepancy in stricture length between and also length discrepancy ≥2 cm based on preoperative and intraoperative measurements. Patient age, stricture etiology, prior endoscopic treatment, prior urethroplasty, type of urethroplasty, complications, and success (easy of passage of a 16 Fr flexible cystoscope on followup) were recorded. Descriptive statistics were used to summarize findings and comparisons were made using t–tests, Chi–square, or Cox regression, where appropriate.

Results: Overall, 210 patients were included in the study with a mean age of 46 years; 90.5% (190) failed endoscopic treatments, while 38.6% (81) also failed prior urethroplasty (Table 1; available at https://cua.guide/). The most common stricture etiologies were hypospadias (34.3%), lichen sclerosus (30.0%), and iatrogenic (15.7%). Preoperative stricture length of

the entire cohort was 5.5 cm (±3.1) and intraoperative stricture length was 6.0 cm (±3.1) (p<0.0001). Overall, 10.5% of patients were found to have a discrepancy of ≥2 cm when compared to preoperative staging (Table 2; available at https://cua.guide/). Of the 210 patients, 100 (47.6%) underwent preoperative staging with pediatric cystoscopy. Patients undergoing preoperative assessment with pediatric cystoscopy had a smaller mean discrepancy in stricture length (0.1 vs. 0.9 cm; p<0.0001) and were less likely to have a discrepancy of ≥2 cm (1.0% vs. 19.1%; p<0.0001) (Table 3; available at https://cua.guide/). Patient age (p=0.31), previous endoscopic treatment (p=0.24), prior urethroplasty (p=0.64), and stricture etiology (p=0.76) were not associated with stricture length discrepancy (Table 4; available at https://cua.guide/). Use of pediatric cystoscopy was not associated with stricture recurrence (p=0.74) or postoperative complications (p=0.58). Ancillary urethral pathology was detected in 7.6% (16/210) of patients.

Conclusions: Preoperative use of semi–rigid pediatric cystoscopy more accurately stages penile urethral stricture length prior to operative intervention. A pediatric cystoscope should be an instrument found in every reconstructive urologist's surgical armamentarium.

MP–6.6

Multichannel urodynamic assessment in men with post–prostatectomy urinary incontinence: A cost–utility analysis

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

Introduction: Men with persistent post–prostatectomy incontinence (PPUI) receive standard investigation (SI) consisting of history, physical examination, and cystoscopy. In complex cases, they receive urodynamic (UDS) assessment, although this is not standard. Some experts argue that UDS should be performed routinely, although there is a paucity of evidence to support this. Therefore, our objective was to compare the quality–adjusted life expectancy (QALE) and the relative cost–utility of treatment decisions based on SI vs. SI+UDS in men with PPUI.

Methods: We constructed a Markov model employing a two–dimensional Monte Carlo simulation using a lifetime horizon to compare the use of preoperative SI+UDS and SI. We assumed that UDS always identifies the correct diagnosis. We validated our model using previous retrospective studies. Transition probabilities and health state utilities were derived from a literature search of MEDLINE and expert consensus. Direct healthcare costs were derived from health administrative data. Using the simulation results, we conducted a cost–utility analysis comparing the two approaches.

Results: Men receiving SI+UDS assessment were incontinent for 12.4 months less than those assessed with SI alone, experienced less medication failure, and had an incremental cost–utility ratio (ICUR) of $1110 per quality adjusted life year (QALY). SI+UDS was cost–effective with a willingness–to–pay (WTP) threshold set at $50 000 per QALY gained. The model was sensitive to patient age at treatment, with SI+UDS becoming the dominant strategy after a threshold age of 70. In probabilistic sensitivity analysis, the model was robust to parameter uncertainty across 1 million iterations. UDS+SI had an 83% of being cost–effective at a WTP of $50 000/QALY.

Conclusions: In this cost–utility analysis model, SI+UDS is cost–effective compared to SI in the pre–treatment investigation of men with PPUI. Future studies should validate these findings in a real population.

MP–6.7

Comparison of cystoscopic vs. magnetic retrieval device for removal of ureteral stents in renal transplant patients: A randomized pilot study

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Introduction: Intraoperative placement of a ureteral stent during renal transplant has been shown to reduce urological complications. Magnetic stents offer a means of bypassing flexible cystoscopy at the time of removal with a small retrieval device. In this single–centre, prospective, randomized feasibility study, we assess the use of the Black–Star® stent and magnetic retrieval device for postoperative stent removal in renal transplant patients.

Methods: Patients undergoing deceased donor renal transplantation were randomized to receive either a traditional double–J ureteral stent or the Black–Star® magnetic stent. A baseline survey assessment was completed at the time of randomization, followed by a postoperative symptom questionnaire (Ureteral Stent Symptom Questionnaire [USSQ]) before and after stent removal. Patient satisfaction, time required for stent removal, urinary tract infection rates, and procedure costs were all recorded.

Results: Thirty–five patients were randomized to traditional ureteral stent or Black–Star® magnetic stent. Total time required for stent removal under cystoscopy was significantly longer (496 seconds, standard deviation [SD] 202.4) compared to magnetic stent removal (269 seconds, SD 138.7; p=0.022). No significant difference was seen in all USSQ domains between groups pre– and post–stent removal. No difference was observed in the rate of urinary tract infections or surgical complications. Stent removal was well–tolerated in both groups.

Conclusions: USSQ scores suggest that the Black–Star® magnetic stent is equally well–tolerated by patients when compared to traditional ureteral stents. Removal of the Black–Star® magnetic stent required less time with no greater discomfort or complication rate compared to stent removal under cystoscopy. A cost–savings analysis is currently underway and will be included. The Black–Star® magnetic stent may offer a well–tolerated and convenient alternative to traditional ureteral stent removal by flexible cystoscopy in renal transplant patients.

MP–6.8

A randomized controlled trial of Hemopatch® vs. no Hemopatch® for the intraoperative hemostasis during deceased donor renal transplant

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Introduction: End–stage renal disease and deceased donor renal transplant (DDRT) has been associated with deleterious effects on hemostasis and can impact status of recipient and graft function. To augment intraoperative hemostasis an ideal hemostatic method is of paramount importance. Hemopatch® is a novel hemostatic pad that is a polyethylene glycol–coated (PEG–coated) collagen patch.

Methods: The objective of this study was to assess efficacy and safety of Hemopatch® in achieving hemostasis in DDRT. We performed a prospective, randomized pilot trial by assigning Hemopatch® by computer randomization. The primary outcomes were amount of intraoperative estimated blood loss (EBL) and subjective achievement of hemostasis following Hemopatch® application; secondary outcome was perigraft collection in ultrasound

Results: Thirty patients were enrolled with median age of 64.5 years. Fifteen were randomized to Hemopatch® and 20 were on blood thinners. The subjective achievement of hemostasis by surgeon was in favour of Hemopatch® in all cases. The EBL (236.37 ml vs. 326.67ml) and perigraft collection (26.67% vs. 40%), although not statistically significant (p value of 0.107 and 0.439, respectively), were lower in Hemopatch® group. The transfusion rate and drain placement were also non–significantly lower in Hemopatch® group. On performing subgroup analysis in patients receiving blood thinners, EBL and perigraft collection favoured Hemopatch® receivers

Conclusions: Hemopatch® is safe, feasible, and has effective hemostasis. One of the primary objectives of subjective evaluation by surgeon was in favour of Hemopatch®. Blood loss, perigraft collection, and blood transfusion are not statistically significant due to small numbers in this pilot study, but trended favourably towards the Hemopatch® group. A small sample size and confounding factors are limitations of the study. This study represents the initial experience with new hemostatic product (Hemopatch®) in DDRT, suggesting encouraging results

MP–6.9

Transitioning from donor travel to kidney shipment for organ delivery in the Canadian Kidney Paired Exchange program

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Introduction: Canada's Kidney Paired Donation (KPD) program currently sends living donors to the site of renal transplantation, but is planning to begin shipping kidneys ex–vivo as the method of organ delivery. We aimed to examine the feasibility of shipping kidneys for the Canadian KPD program, and to provide recommendations to facilitate transition to a kidney shipment model.

Methods: Data was gathered from transport Canada and provincial ministries of transportation for transportation by road or rail. Web searches were performed for national air carrier flight cancellation rates, average flight delay times, flight distances, and scheduled departure times.

Results: 1) Travel by rail: There is greater than 48 000 km of track within Canada with centrally located railway stations and negligible delay times. 2) Travel by road: Travel times are heavily impacted by weather and unpredictable delays. Provincial police and third–party organizations have arranged police escorts to expedite highway travel. 3) Travel by air: Flight times and distance between transplant centres reach up to 7 hour 45 minutes (excluding layover time between flights in Toronto) and 4638 km. Flight delay rates, average delay time, and cancellation rates reach 71%, 54 minutes, and 9%, respectively.

Conclusions: Canada's vast geography combined with extreme weather conditions presents significant obstacles for safe and timely organ delivery. We provide recommendations: 1) utilization of all national air carriers; 2) utilization of rail transport; 3) involvement of a third–party logistical organization; 4) adjusted nephrectomy start times and dedicated evening transplant slating; and 5) continued use of the travelling donor model in special circumstances.

MP–6.10

Prophylactic heparin infusion: A safe preventative measure for thrombotic complications in pediatric kidney transplant recipients weighing <20 kg?

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Introduction: Small–sized children (<20 kg) who receive kidney transplants are at high risk of allograft vessel thrombosis.[1] Heparin prophylaxis (HP) has been used in order to mitigate this risk, but may infer an increase in bleeding risks.[2] At our institution, unfractionated heparin 10 units/kg/hour is used as HP since 2009. Therefore, this investigation aims to determine whether HP is a safe means to prevent thrombosis in small kidney transplant patients by comparing those who have received HP and those who have not received HP (NHP).

Methods: A retrospective review of patients <20 kg who underwent kidney transplant in our institution from 2000–2015 was performed. Patients at increased risk of thrombosis (previous thrombosis, thrombophilia, nephrotic syndrome) and bleeding (therapeutic doses of heparin, diagnosis of coagulopathy) were excluded. Parameters collected included: age, weight, sex, dialysis type, donor type, heparin infusions/doses, hemoglobin (Hb) levels, post–transplant pRBC transfusions, surgical re–exploration, and thrombotic events. Bleeding complications were defined as: drop in Hb >20 mg/L, post–transplant pRBC transfusions, and surgical re–exploration.

Results: A total of 56 patients were identified (HP n=46; NHP n=10). Baseline demographics were similar between HP & NHP (Table 1; available at https://cua.guide/). HP group was more likely to have drop in Hb >20 g/L (67.4% vs. 30.0%; p=0.038). There was no statistical difference in frequency of transfusions, surgical re–exploration, or thrombotic events, but those who had drop in Hb >20 g/L were more likely to also require pRBC transfusions (Table 2; available at https://cua.guide/). Subgroup analysis of the HP group showed that those who had bleeding complications had similar Hb levels as those who did not at baseline and post–transplant (Table 3; available at https://cua.guide/).

Conclusions: HP may be effective at preventing thrombotic complications in kidney transplant recipients weighing <20 kg. However, HP increases the likelihood of >20 g/L drop in Hb, which may increase the rates of transfusions.

References:

1. Kranz B, Vester U, Nadalin S, et al. Outcome after kidney transplantation in children with thrombotic risk factors. *Pediatr Transplant* 2006;10:788–93. https://doi.org/10.1111/j.1399–3046.2005.00483.x
2. Murashima M, Konkle B, Bloom RD, et al. A single–centre experience of pre–emptive anticoagulation for patients with risk factors for allograft thrombosis in renal transplantation. *Clin Nephrol* 2010;74:351–7. https://doi.org/10.5414/CNP74351

UP–6.1

Urological complications following renal transplantation: Who and why?

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Introduction: Urological complications after renal transplantation, such as ureterovesical strictures (UVS) and urinary tract infections (UTI), can compromise graft survival and impact patient morbidity. Our objective was to retrospectively review renal transplants performed at our centre to determine the incidence of UVS and UTI, as well as to examine patient and surgical factors possibly related to the development of these complications.

Methods: All renal transplants performed at our centre between June 2011 and September 2013 were retrospectively reviewed. The primary outcome was the diagnosis of UVS or UTI within one year postoperative. UVS was defined as clinically significant hydronephrosis due to stricture disease necessitating intervention. UTI was defined as positive urine culture in the presence of lower urinary tract symptoms. Patient and surgical factors were assessed to see if they were predictors of the primary outcomes.

Results: A total of 288 patients were eligible for inclusion in our retrospective review. UTIs occurred in 9.9% of patients, with E. coli being the most common organism (55.2%). The majority of UTIs (58.6%) occurred with the stent in situ, however, there was no correlation between stent duration and development of a UTI. UTIs were weakly associated with older age (r=0.126; p=0.04), and female gender (r=0.135; p=0.03). UVS were seen in only three patients (1.0%), with mean time of presentation 16.7 weeks postoperative. UVS were weakly associated with a history of prior kidney transplantation (r=0.200; p<0.01) and DGF (r=0.233; p<0.001).

Conclusion: This study demonstrates that while UTIs are somewhat common post–renal transplant (~10%), UVS are relatively rare (~1%). Our study suggests older women are more prone to UTIs, but duration of stenting may not impact rate of UTIs. In addition, we found that UVS often present in a delayed fashion, so early routine transplant ultrasonography at 8–10 weeks postoperative may not be beneficial.

UP–6.2

Better defining the optimal management of penile urethral strictures: A retrospective comparison of single–stage vs. two–stage urethroplasty

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Introduction: The purpose of our study is to compare single–stage and two–stage urethroplasty techniques in the treatment of penile urethral strictures.

Methods: We performed a retrospective review of penile urethroplasties performed at a single centre between 2003 and 2017, including all patients who underwent repair of a penile urethral stricture. The primary outcome was urethral patency, defined as the ability to easily pass a 16 Fr flexible cystoscope at six and 18 months of followup, and development of complications.

Results: In total, 101 single–stage procedures (48 buccal mucosal graft [BMG] and 53 penile fasciocutaneous flap [PFF]) and 53 two–stage procedures were performed. There was no difference in mean stricture length between groups (p=0.25). Cox regression analysis did not find stricture etiology (p=0.76), length (0.29), age (p=0.24), obesity (p=0.07), prior reconstruction (p=0.36), or urethroplasty technique (p=0.35) to be associated with failure. Kaplan–Meier plots and log rank testing did not demonstrate a difference in success rates between surgical techniques (91% PFF vs. 83% BMG vs. 87% two–stage). Overall, 36% (56/154) of patients experienced a complication (51% PFF vs. 25% BMG vs. 32% two–stage). Binary logistic regression analysis found urethroplasty technique to be the only factor associated with development of complication (p=0.02). The odds ratio for complications relative to BMG was 3.1 (95% confidence interval [CI] 1.33–7.30; p=0.009) for PFF and 1.4 (95% CI 0.59–3.4; p=0.43) for two–stage urethroplasty.

Conclusions: There appears to be little difference in success for penile urethroplasty between single–stage BMG, PFF, and two–stage urethroplasties. Complication rates were higher with single–stage PFF and two–stage repairs. The paradigm shift to a single–stage BMG, when appropriate, appears to be founded on the basis of less operations for the patient, relative to a two–stage repair, and a lower complication profile, relative to single–stage PFF, without compromising success rates.

UP–6.3

Characterization and outcomes of hypospadias–associated urethral strictures in adults: Proposal of a treatment classification system

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Introduction: Urethral stricture is one of the most frequent complications after hypospadias repair (HR), but remains poorly described.[1–5] The aim of this study is to better characterize hypospadias–associated urethral strictures (HAUS) and postoperative outcomes (PO).

Methods: We included 84 patients who underwent urethroplasty (UP) for HAUS from 2003–2016 at our centre. All patients underwent preoperative cystoscopy and urethrogram, as well as at six and 18–24 months PO. They were divided into four groups based on their stricture characteristic: Group 1: Previous HR with stricture involving the entire repair; Group 2: "Junctional stricture" with acceptable HR and stricture at the junction of the neourethra and native urethra; Group 3: Isolated stricture outside the repaired urethra; and Group 4: Urethral stricture in non–treated hypospadias. Patients were characterized with regard to age, stricture length, location, concurrent pathology/complications, previous repairs, and type of UP, as well as PO outcomes and complications. Univariate and survival multivariate analysis were performed.

Results: Median patient age was 36 years and mean stricture length 5.0 cm (Table 1; available at https://cua.guide/). Patients were categorized in four groups based on stricture length, location and number of previous procedures (Table 2; available at https://cua.guide/). Overall, UP for HAUS was successful in 88.1%, with a mean followup of 19 months, a complication rate of 9.5%, and a 21.4% rate of urethrocutaneous fistula (Table 3; available at https://cua.guide/). Group 1 (66.7% of the total) required staged UP in 75% of cases; Group 2 (7.1%) and Group 3 (10.7%) typically had single stage UP with oral mucosa in 83.3% and 66.7% of cases, respectively, while Group 4 (15.5%) required penile fasciocutaneous flap UP in 69.2% of cases. Despite differing by stricture length (p=0.02), localization (p<0.001), and number of previous repairs (p<0.001), groups did not significantly differ by UP success (p=0.82), complications (p=0.16), or urethrocutaneous fistula (p=0.19) (Fig. 1; available at https://cua.guide/), whereas individual UP techniques did.

Conclusions: Based on our series findings, we propose that HAUS can be classified into one of four categories. While UP for HAUS is highly successful, a classification–based approach can allow to obtain similar outcomes in terms of recurrence and complications in all groups, regardless of the baseline differences.

References:
1. Craig JR, Wallis C, Brant WO, et al. Management of adults with prior failed hypospadias surgery. *Transl Androl Urol* 2014;3:196–204.
2. Hoy NY, Rourke KF. Better defining the spectrum of adult hypospadias: Examining the effect of childhood surgery on adult presentation. *Urology* 2017;99:281–6. https://doi.org/10.1016/j.urology.2016.07.057
3. Myers JB, McAninch JW, Erickson BA, et al. Treatment of adults with complications from previous hypospadias surgery. *J Urol* 2012;188:459–63. https://doi.org/10.1016/j.juro.2012.04.007
4. Snodgrass WT, Bush NC. Management of urethral strictures after hypospadias repair. *Urol Clin North Am* 2017;44:105–11. https://doi.org/10.1016/j.ucl.2016.08.014
5. Tang S–H, Hammer CC, Doumanian L, et al. Adult urethral stricture disease after childhood hypospadias repair. *Adv Urol* 2008;2008:1–4.

UP–6.4

Pulsed fluoroscopy in retrograde urethrogram

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Introduction: Retrograde urethrogram (RGU) is one of the cornerstones for the reconstructive urologist. With hundreds of RGUs being performed yearly in busy reconstructive centres, the concern for radiation exposure to the patient and the medical personnel becomes important. The ALARA radiation principle (As Low As Reasonably Achievable) is an important aspect for safety that is now a part of the regulations. We propose the use of pulsed fluoroscopy (PF) to decrease the radiation exposure for patient and medical personnel.

Methods: Between March 2016 and September 2017, RGUs were performed by a single urologist. The fluoroscopy machine was set for PF at a setting of four pulses per second. The urologist controlled the pedal for fluoroscopy. Patient information, including demographics, preoperative diagnosis, intraoperative findings, and fluoroscopy time were recorded.

Results: Forty–five RGUs were performed between March 2016 and September 2017. The median fluoroscopy time was 2.35 seconds (range 0.9–6.5). Quality of RGU was not noted to be less than normal apart from a grainy picture (Fig. 1; available at https://cua.guide/). Ten RGUs were a repeat for postoperative confirmation of patency. Pathology (e.g., stricture/fistula) were identified in 51% (23) of the examinations. There was a 95% (22) positive intraoperative confirmation of the RGU findings. The one patient that the RGU missed was likely due to incomplete opacification of the distal penile urethra and it was noted intraoperatively.

Conclusions: Pulsed T4 fluoroscopy reduces the radiation exposure in RGU. Regular fluoroscopy can use 2–3 times the amount of radiation. PF was not associated with reduction in the diagnostic capacity of the test. Reduction of fluoroscopy can have detrimental cumulative effect as per the ALARA principle for the patient and medical personnel involved in the patient care.

UP–6.5

Bladder neck contracture continues to be a misused terminology

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Introduction: Nomenclature is important, as it promotes adequate comparisons, communication, and scientific progress. In 2014, the Société Internationale d'Urologie/International Consultation on Urethral Strictures (SIU/ICUD) published recommended nomenclature, in particular differentiating between bladder neck contracture after transurethral surgery and vesicourethral stenosis after radical prostatectomy (given the lack of bladder neck).[1] However, we hypothesize that these terms remain incorrectly used. Our objective was to report how prevalent the term bladder neck contracture/stenosis was misused in a survey of the current literature.

Methods: A search of the MEDLINE database between January 2015 and June 2017 was conducted. Articles were searched for the terms "bladder neck contracture," "bladder neck stenosis," "vesicourethral stenosis," and "vesicourethral anastomotic stricture." All review and original research articles with male subjects were included. Articles were excluded if the etiology of the term could not be determined.

Results: A total of 82 articles were identified with 78 meeting inclusion criteria. Thirty–nine academic journals were represented. The term "bladder neck contracture or stenosis" was present in 65 articles; 18 (30.7%) of these articles, which represented 14 different journals of varying impact factors, used the term "bladder neck contracture/stenosis" incorrectly. Vesicourethral stenosis was used in 13 articles with 100% accuracy.

Conclusions: There remains misuse of the term "bladder neck contracture/stenosis" in the current literature. Efforts should be made to ensure proper nomenclature to promote proper scientific communication, standardization, and further research.

Reference:

1. Latini JM, McAninch JW, Brandes SB, et al. SIU/ICUD consultation on urethral strictures: Epidemiology, etiology, anatomy, and nomenclature of urethral stenoses, strictures, and pelvic fracture urethral disruption injuries. *Urology* 2014;83:S1–7. https://doi.org/10.1016/j.urology.2013.09.009

Poster Session 7: Pediatrics
June 25, 2018; 0800–0930

MP–7.1
Improving operating room efficiency by decreasing turnover times using a dedicated "Fastlane" protocol

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Introduction: In a value–driven healthcare system, decisions involving resource allocation and asset management are often made based on cost. Operating room (OR) cancellations or delays frequently occur due to patient and system factors, resulting in inefficacy and loss of operating time. The objective of our study was to investigate a model, "Fastlane," for improving efficiency by increasing OR throughput for outpatient, low–complexity pediatric urology cases at a tertiary children's hospital.

Methods: "Fastlane" was a six–week pilot model, during which a selected team of core surgeons, anesthesiologists, and nursing staff committed to shorter turnover times was tested compared to historic controls. Patients included were low–risk (American Society of Anesthesiologists [ASA] 1–2) outpatient, inguinal–genital surgeries that were anticipated to take less than one hour by the surgeon. Patients were to arrive three hours prior to surgery, instead of the usual two–hour period, and fast an additional hour. A dedicated postoperative location for patients to be received in the recovery area was created, and having the same nurse complete both preoperative and postoperative assessments to minimize handover time between nursing staff was instituted. Data was prospectively collected, including: the time that the patient arrived in the OR (AT), surgery start time (SST), surgery end time (SET), and time that patient left the OR (LT). Induction time (IT) was calculated as SST–AT. Turnover time was calculated as the time that the previous patient left the OR (LT) to the next patient's arrival to the OR (AT). Case length time was calculated as LT–AT. Patient controls for the study cohort were randomly selected from the prior two year's OR activity logs on the same surgery by the same surgeon.

Results: In total, 33 pediatric urology patients, managed by two surgeons, were evaluated over the six–week period. The mean case length time was significantly shorter for "Fastlane" patients (47 vs. 68 minutes for the control group; $p<0.00014$). Mean IT was longer in the control group (21 vs. 17 minutes in the pilot group; $p=0.047$). Turnover time was significantly lower in the "Fastlane" group compared to the control cohort, with turnover times of 17 vs. 26 minutes, respectively ($p=0.0008$; standard deviation 9.08).

Conclusions: A defined, committed team and standardized OR handoff protocol results in improved OR efficiency by reducing turnover times. This potentially increases the opportunity for optimizing the number of selected pediatric urological outpatient surgeries on a given operating schedule.

MP–7.2
Scrotal vs. inguinal orchidopexy impact on postoperative pain and complications: A randomized controlled trial

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Introduction: We sought to compare the impact of orchidopexy approach (scrotal [SO] vs. inguinal [IO]) on analgesic requirements, postoperative pain scores, and complication rates.

Methods: A superiority randomized controlled trial including boys 10–95 months of age at surgery diagnosed with palpable undescended testicles (UDT) was conducted. Patients with non–palpable or bilateral UDTs, previous orchidopexies, and concurrent procedures were excluded. Block randomization with 1:1 allocation ratio was employed, as was a standardized anesthesia protocol with peri/postoperative analgesia. The primary outcome was postoperative pain and analgesic use in hospital and at home using validated pain scales. A two–point difference in pain scales was considered as a minimally important difference. Secondary outcomes included operative time (OT), conversion and success rates, and complications at 6–8 weeks.

Results: Of 1170 screened patients, 174 (15%) were eligible and 128(74%) recruited. Of the 106 boys who completed assessment, 54 had IO and 52 SO. Baseline demographics are presented in Table 1 (available at https://cua.guide/). No significant differences in number of in hospital analgesic doses or mean pain scores over the 48–hour postoperative period were observed. Mean analgesic use at home was higher for SO ($p<0.01$). Mean OT were not significantly different with an intention to treat (ITT) approach. Per treatment (including conversions) analyses showed that IO was 7 minutes faster (40±11 vs. 33±15; $p<0.01$). Conversions occurred in 17/106 (16%) testes. Overall complication rates were low and similar (3% [1–reascent/1–incision dehiscence–SO; 1–wound infection–IO]).

Conclusions: SO is not superior to IO on postoperative pain, analgesic consumption, OT (ITT) or complications. SO may not be a suitable approach for all patients with canalicular testes. Selection of surgical approach should not be based on assumed benefits in terms of analgesia or complications.

MP–7.3
Urinary tract dilation classification system: Natural history and hydronephrosis outcome according to risk groups

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Introduction: The urinary tract dilation (UTD) system was introduced in 2014 as a risk–based grading for congenital hydronephrosis. It does not aim to diagnose the underlying pathology, but to stratify hydronephrosis based on the need of surgery and complication rate. In our study, we reviewed the natural history and the fate of hydronephrosis for each risk group of the UTD system.

Methods: A retrospective review was conducted for patients who presented with postnatal hydronephrosis from 2008–2014. Reviewed data included patients' characteristics, fate of hydronephrosis, febrile urinary tract infections (fUTI), rate of surgical interventions, and final diagnoses. Fate of hydronephrosis was resolved, improved, stable, or worsening. Resolved hydronephrosis was defined as collapsed pelvicalyceal system with non–

visualized ureter behind the bladder. Units with resolved hydronephrosis, under conservative management, were evaluated in terms of fUTI, age at resolution, and final diagnoses.
Results: We included 428 patients with 552 renal units. The median followup was 36.4 months (3–109.5). Nearly all UTD P1 were diagnosed as isolated hydronephrosis. Fifty–one percent of UTD P1 (148 units) were assessed using voiding cystourethrograms. Of them, only nine units (6.1%) were diagnosed as vesicoureteral reflux (VUR) (eight low–grade, one high–grade). Globally, most of diagnosed VURs (59%) were UTD P2, with 64% of them low–grade. In comparison, 70% of VURs that were associated with UTD P3 were high–grade. UTD P1 had significant low risk for surgical and UTI incidence in comparison with the other groups. Notably, none of UTD P1 renal units had surgical interventions during followup, in comparison to 71% of UTD P3. There was no difference in the terms of fUTI incidence and recurrent infection between UTD P2 and UTD P3 (p=0.53). The median time to resolution was about double for UTD P3 in comparison to the other groups (p=0.007). The risk of surgical interventions was significantly higher in the UTD P3 than UTD P2 (p<0.001). Regarding hydronephrosis resolution, only 9.9 % (10/97) resolved UTD P3 units received conservative management in comparison to 78.2% (226/289) of UTD P1.
Conclusions: Most UTD P1 units resolved or improved on conservative management with no risk of surgical intervention and least risk of fUTI. Units with VUR and UTD P1 were mostly resolved during followup (8/9).

MP–7.4
Urethrocutaneous fistula repair following hypospadias repair using the "preserve the tract and turn it inside out" technique: A single–centre experience

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Introduction: Urethrocutaneous fistula (UCF) development following primary hypospadias repair is a common complication that creates functional and cosmetic issues. Fistula repair has entailed local excision and multilayered closure, however, fistula recurrence is high.[1] A novel technique for management of these fistulas, the PATIO (preserve the tract and turn it inside out) repair, has been described and has shown encouraging outcomes in previous reports.[2,3] The aim of this study was to evaluate fistula repair success in patients undergoing the PATIO technique compared with traditional repairs.
Methods: A retrospective chart review was performed for patients undergoing UCF repair from January 2005 to July 2017. Data, including age, followup, hypospadias and fistula repair surgeon, meatal location, meatal stenosis, number of fistulas and repairs, UCF location, complications, and outcomes, was obtained. All fistula repairs were performed by two pediatric urologists. Cases were categorized into PATIO repair, traditional repair, and a combination. The primary outcome was freedom from fistula recurrence on ongoing followup.
Results: In total, 36 patients underwent 38 UCF repairs during this period. Mean age at repair was 19 months. Median followup time was 34 months. For PATIO repair alone, 10/12 had success. For traditional repair alone, 8/18 had success, 8/18 had failed, and 2/18 were lost to followup. For traditional repair followed by PATIO repair, 7/7 had success. Failure following PATIO repair was found in cases where the procedure was early in implementation and experience was limited.
Conclusions: UCF repair using the PATIO technique has shown encouraging results in the short–term, with a majority of patients achieving a successful outcome. As this procedure continues to be used and experience develops, a larger sample of cases will become available for analysis and longer followup will prove necessary in examining the long–term outcomes of this procedure.
References:
1. Srivastava R, Tandale MS, Panse N, et al. Management of urethrocutaneous fistula after hypospadias surgery — An experience of 35 cases. *Indian J Plast Surg* 2011;44:98–103. https://doi.org/10.4103/0970–0358.81456
2. Malone PR. Urethrocutaneous fistula: Preserve the tract and turn it inside out: The PATIO repair. *BJU Int* 2009;104:550–4. https://doi.org/10.1111/j.1464–410X.2009.08350.x
3. Nerli RB, Metgud T, Bindu S, et al. Solitary urethrocutaneous fistula managed by the PATIO repair. *J Pediatr Urol* 2011;7:166–9. https://doi.org/10.1016/j.jpurol.2010.04.016

MP–7.5
Assessment of risk factors for surgical complications in neonatal circumcision clinic

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Introduction: Thirty percent of male newborns are circumcised annually in Canada.[1] Circumcision, however, carries risks, as well as potential benefits.[2,3] Despite this, there is limited data on risks for complications of neonatal circumcision without clinically relevant quantification of risk factors. Herein, we aim to assess potential risk factors contributing to complications of neonatal circumcision.
Methods: A retrospective review was performed on all males who underwent a neonatal circumcision in our institution's pediatric urology clinic between January 2015 and June 2017. Parameters collected included age (corrected for pre–maturity), weight, circumcision technique, comorbidities, indications for circumcision, complications (early <24–hour, long–term >24–hour), return to operating room (OR), and post–circumcision communications. Age and weight were dichotomized to determine a clinically relevant cutoff value.
Results: A total of 277 patients were identified. The mean age and weight were 28.4 days and 4.3 kg; 93.1% of cases were elective and 12.3% of patients had comorbidities (Table 1; available at https://cua.guide/). Circumcisions were performed using Mogen (61.4%) or Gomco clamps (39.6%) under local anesthesia. There were 18 patients (6.5%) with bleeding requiring sutures. Twenty–six patients (9.4%) experienced long–term complications, with most being penile adhesions (84.6%). One of these patients required surgical intervention (Table 2; available at https://cua.guide/). One patient visited the emergency room due to postoperative bleeding from the circumcised area, which was managed conservatively. Weight >5.1 kg was identified as a risk factor for bleeding requiring sutures (odds ratio [OR] 4.15; 95% confidence interval [CI] 1.25–13.80) and long–term complications (OR 3.74; 95%CI 1.36–10.31) (Tables 3, 4; available at https://cua.guide/).
Conclusions: This investigation revealed low rates of complication, regardless of whether Mogen or Gomco was used. Patients weighing >5.1 kg may be at higher risk of bleeding and long–term complications, such as adhesions, suggesting that weight, rather than age, might be identified as a limit for safe circumcision.
References:
1. Sorokan ST, Finlay JC, Jefferies AL. Newborn male circumcision. *Paediatr Child Heal* 2015;20:311–5. https://doi.org/10.1093/pch/20.6.311
2. Weiss HA, Larke N, Halperin D, et al. Complications of circumcision in male neonates, infants, and children: A systematic review. *BMC Urol* 2010;10:1–13. https://doi.org/10.1186/1471–2490–10–2
3. American Academy of Pediatrics. Circumcision policy statement. *Pediatrics* 2012;130:585–6. https://doi.org/10.1542/peds.2012–1989

MP–7.6

A contemporary comparison of traditional, open–access, and predatory publishing in pediatric urology

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Introduction: The burgeoning trend of open–access publishing allows for unrestricted and rapid knowledge dissemination. There are benefits for low–income countries, where interested parties may be unable to access aarticles through traditional subscriptions, and allows for more egalitarian access.[1] The open–access model has now appeared across a number of specialties and can generate higher citation levels than traditional models.[2,3] However, the establishment of predatory journals has facilitated the exploitation of this model and, for a cost, these predatory journals may publish work that has not gone through peer–review.[4] The aim of this study was to compare and analyze the incidence, characteristics, and trends of publishing models in pediatric urology

Methods: A PubMed/Medline review was carried out for all articles using the terms "p(a)ediatric urology" over a five–year period from October 2012 to October 2017. These were all individually accessed and cross–checked using Journal Citation Reports (JCR). Bibliometric data, journal type, and access model were all individually assessed, ranked, and compared.

Results: From an initial 4075 articles, 2244 met inclusion criteria. Open–access journals were more likely to publish scientific vs. clinical articles (10.9% vs.3.3%; p<0.001). They were also more likely to have higher author (6.1 vs. 5.6; p=0.027), and patient (6291 vs.1139; p=0.015) numbers, as well as higher average citations (31290 vs.13544; p=0.02). There was no difference in journal impact factors between models (3.1 vs. 2.7; p=0.276). A total of 272 articles were from non–indexed journals. There was a higher number of predatory journals affecting open–access publishing (26.51% vs.1.29%; p<0.0001).

Conclusions: Open–access, peer–reviewed publishing has led to increased access with upfront costs, as well as higher average citations without affecting impact factor. The authors conclude that caution is advised not to fall prey to predatory journals that seek to increase profits at the expense of high publishing standards.

References:

1. Bowman DE, Wallace MB. Predatory journals: A serious complication in the scholarly publishing landscape. *Gastroint Endosc* 2018;87: 273–4. https://doi.org/10.1016/j.gie.2017.09.019
2. Chua SK, Quereshi AM, Krishnan V, et al. The impact factor of an open–access journal does not contribute to an article's citations. *F1000Res* 2017;6: 208. https://doi.org/10.12688/f1000research.10892.1
3. Beall J. Best practices for scholarly authors in the age of predatory journals. *Ann R Coll Surg Engl* 2016; 98:77–9. https://doi.org/10.1308/rcsann.2016.0056
4. Sorokowski P, Kulczycki E, Sorokowska A, et al. Predatory journals recruit fake editor. *Nature* 2017;543:481–3. https://doi.org/10.1038/543481a

MP–7.7

Studying the learning curve: A prospective study on step–specific operative times for pediatric robotic–assisted pyeloplasty and reimplantation

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Introduction: The initiation of a pediatric robotic surgery program leads to an increase in operative times, which incrementally increases healthcare costs. This study investigates the learning curve of a single surgeon initiating robotic–assisted pyeloplasty (RAP) and robotic–assisted ureteral reimplantation (RUR) in the Canadian healthcare system. We hypothesized that total operative times will decrease early in the learning curve, primarily due to reduced intra–corporeal suturing times.

Methods: This prospective cohort study included all RAP and RUR procedures performed between July 2013 and December 2017. Both operations were sectioned into discrete operative steps and total and step–specific times were recorded prospectively in the operating room by an unbiased coder. The primary outcome was the trends of total and step–specific times and the first and last quartiles were compared using the Student's t–test.

Results: Thirty–nine RAP and 24 RUR were performed during the study period. Age at surgery, laterality, and outcomes were similar in the first and last quartiles (p>0.05). In the RAP cohort, the mean operative times decreased 35.4% (211 to 136 minutes), with maximal reductions noted in pelvic dismemberment and ureteral spatulation (69.7% reduction) and in uretero–pelvic anastomosis (53.3% reduction). In the RUR cohort, mean operative times decreased 32.6% (223.7 to 150.8 minutes) with maximal reductions in ureteral dissection (50.7% reduction) and suturing of the detrusor tunnel (56.7% reduction).

Conclusions: A reduction in intracorporeal suturing and spatulation time (for RAP) and reduced suturing and ureteral dissection time (for RUR) are responsible in reducing operative times for RAP and RUR, suggesting that the primary benefit of the robotic platform is in aiding intracorporeal suturing and performing more complicated intracorporeal dissection maneuvers. Despite a relatively low volume of robotic cases (14/year), this efficiency was achieved within the first 20 procedures for both RAP and RUR.

MP–7.8

Machine learning and artificial intelligence to predict urinary tract infections and continuous antibiotic prophylaxis in prenatal hydronephrosis

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Introduction: Prenatal hydronephrosis (PHN) affects up to 5% of infants. These children can undergo a battery of testing, develop urinary tract infections (UTI), and require continuous antibiotic prophylaxis (CAP).[1] Current management strategies are based on subjective radiographic grading systems. Being able to better identify patients who will need further intervention will allow us to better target our investigations and management. The increasing availability of sophisticated machine learning and artificial intelligence platforms provides a novel opportunity to build accurate predictive models that are easy to distribute and use.[2] We explored the application of this technology by creating a predictive model for patients with PHN who will develop UTIs or require CAP.

Methods: A de–identified prospective PHN database from McMaster University was uploaded to the Microsoft® Azure Machine Learning Studio. Two models, a boosted decision tree learning model and an artificial neural network model, were trained. These were then scored against a test dataset and evaluated to determine the optimal model.

Results: Five hundred seventy–one entries were included. The model for UTI prediction achieved an area under the curve of 0.925. When sensitivity is maximized, we achieved a sensitivity of 88%, specificity of 89%, and accuracy of 0.889. The model for CAP prediction achieved an area under the curve of 0.948. When sensitivity is maximized, we achieved a sensitivity of 94%, specificity of 65%, and accuracy of 0.825.

Conclusions: We built two accurate predictive models with a commercially available, easily accessible, cloud–based machine learning platform. These models' strong performance characteristics suggest their affinity to be used as screening tests to identify patients who require further evaluation and specialist consults. These emerging technologies provide an opportunity to surpass the current standard of predictive analytics and represent the next development in personalized medicine.

References:

1. Psooy K, Pike J. Investigation and management of antenatally detected hydronephrosis. *Can Urol Assoc J* 2009;3;69–72. https://doi.org/10.5489/cuaj.1027
2. Obermeyer Z, Emanuel E J. Predicting the future – Big data, machine learning, and clinical medicine. *N Engl J Med* 2016;375:1216–9. https://doi.org/10.1056/NEJMp1606181

MP–7.9

A prospective cohort study on the safety and success of pediatric robot–assisted laparoscopic ureteric reimplantation in the Canadian healthcare system

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Introduction: Concerns have been raised regarding the safety and success of pediatric robotic assisted extravesical ureteric reimplantation (RUR). Based on the IDEAL framework for surgical innovation, RUR is currently at the exploratory phase (Stage 2a). This study explores the safety and outcomes of RUR in the first Canadian series to date.

Methods: This prospective cohort study includes all RUR procedures performed between July 2013 and June 2017 by a single surgeon using a standard three–port technique, without ureteric stenting. The primary indication for surgery was recurrent breakthrough urinary tract infections (UTIs) or UTIs after cessation of antibiotic prophylaxis (ABP), despite adequate treatment for bladder–bowel–dysfunction. Success was defined for patients who had at least six months' followup as resolution of UTIs off ABP or a negative voiding cystourethrogram (VCUG) (in those who had UTIs after surgery).

Results: A total of 21 RURs were performed on 19 females and two males. The average age at surgery was 5.4 years (range 12–129 months). RUR complications included one intraoperative acute kidney injury treated conservatively and one delayed distal thermal ureteric injury, which required stenting. Post–stent removal, this patient remained asymptomatic with no evidence of obstruction. Twelve patients remained UTI–free off ABP after surgery, while nine who had persistent UTIs (≥2) postoperatively underwent a VCUG, which showed no evidence of persistent vesicoureteric reflux in all. Three of these nine patients remain on ABP.

Conclusions: RUR remains a technically challenging procedure that needs further investigation in a systematic manner before universal adoption. Despite a comparable success rate to open ureteric reimplantation, robotic dissection techniques have to be standardized and improved to prevent ureteric injury.

MP–7.10

A followup geospatial analysis of hypospadias and cryptorchidism prevalence rates in a Canadian province with a stable population

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Introduction: Our group has reported significant clustering of hypospadias and cryptorchidism at the county level in areas of intense agricultural activity in Nova Scotia (NS).[1] The goals of this followup study were: 1) to perform a granular geospatial analysis at the postal code level; and 2) to determine whether there is spatial correlation between these conditions and industries linked to toxic output.

Methods: Cases of hypospadias and cryptorchidism were identified based on ICD–10 codes from the ATLEE Perinatal Database with records of all live births in NS between 1988 and 2013. Data were geocoded and mapped based on the three first digits of the maternal postal code (Forward Sortation Area [FSA]) using ArcGIS 10.5.[2] Regional prevalence of congenital anomalies was calculated for each of the 77 FSAs. To identify statistically significant high and low prevalence clusters for each anomaly, Local Morans I was used on the spatial data. In addition, geospatial point data was created for industries linked to toxic output and correlation between clusters of malformations and proximity to these industries was assessed.

Results: During the study period, there were 1045 cases of hypospadias and 993 cases of cryptorchidism. Both hypospadias (five high– and one low cluster; $p<0.036$) and cryptorchidism (three high– and one low–cluster; $p<0.013$) demonstrated statistically significant areas of high and low prevalence clusters (Figs. 1, 2). There was no apparent spatial correlation between the local clustering of the congenital malformations and proximity to toxic industries.

Conclusions: In this followup of detailed geospatial analysis of hypospadias and cryptorchidism prevalence in an area with stable population, we did not confirm the previous findings of high clustering in areas of intense agricultural activity. Furthermore, our analysis did not find high clustering of the congenital malformations in areas near toxic industries to support an environmental role in their development.

References:

1. Lane C, Boxall J, MacLellan D, et al. A population–based study of prevalence trends and geospatial analysis of hypospadias and cryptorchidism compared with non–endocrine mediated congenital anomalies. *J Ped Urol* 2017;13:284.e1–7. https://doi.org/10.1016/j.jpurol.2017.02.007
2. ESRI, Redlands, CA, USA.

MP–7.11

A comparison of the incidence and clinico–demographics of pediatric epididymal cysts

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Introduction: With only a small number of studies in modern literature pertaining to epididymal cysts, with an average of 32 patients per study (median n=1),[1] it remains unknown whether any risk factors exist for these children or what the best method of management is.[2,3] The cysts are thought to regress in children.[4,5] The aim of this study was to assess the incidence, clinico–demographics, and outcomes of epididymal cysts in a pediatric cohort.

Methods: Our institutional ultrasound (US) database was searched for all scrotal US. From these, a filtered, IRB–approved search was performed for any reports containing the word "cyst." These were then cross–referenced with a retrospective chart review (October 2006–September 2017). Clinico–demographics, cyst characteristics, and outcomes were analyzed for both pre– and post–pubertal boys using descriptive and non–parametric statistical methods.

Results: Of 4508 boys undergoing scrotal US during this period, 191 were indicated to contain cysts. Of these, 109 scans (2.4%) met inclusion criteria (85 pre–pubertal; 24 post–pubertal); 70.5% of epididymal cysts were incidental. There was no difference between cohorts in terms of presence of hydrocoele ($p=0.9$), symptoms ($p=0.9$), ordering service ($p=0.61$), rate of resolution (4.2% vs. 8.2%; $p=0.68$), or length of followup (4 vs. 4.5 years; $p=0.44$). Pre–pubertal cysts were smaller in size (3.35 vs. 4.62 mm; $p=0.025$), and more likely to trigger repeat scanning (n=67 vs. n=10; $p=0.008$). There were no operative interventions, and no subsequent clinical deterioration occurred with observation.

Conclusions: Epididymal cysts are comparable in pre– and post–pubertal boys, and can be safely managed using a conservative approach. The higher–than–expected rate of detection may be a result of the improved ultra–resolution of modern scanners. These children should not require repeat surveillance imaging solely for epididymal cysts, and could be managed in a primary care setting with clinical examination.

References:

1. Fiogbé MA, Gbénou AS, Metchihoungbé S, et al. [Epidemiological and clinical aspects of visible urogenital malformations among adolescent's schoolboys at Cotonou]. *Prog Urol* 2013;23:1428–34. https://doi.org/10.1016/j.purol.2013.04.015
2. Erikci V, Hoşgör M, Aksoy N, et al. Management of epididymal cysts in childhood. *J Pediatr Surg* 2013;48:2153–6. https://doi.org/10.1016/j.jpedsurg.2013.01.058
3. Niedzielski J, Miodek M, Krakós M. Epididymal cysts in childhood — conservative or surgical approach*? Pol Przegl Chir* 2012;84:406–10. https://doi.org/10.2478/v10035–012–0068–2
4. Homayoon K, Suhre CD, Steinhardt GF. Epididymal cysts in children: Natural history. *J Urol* 2004;171:1274–6. https://doi.org/10.1097/01.ju.0000110322.87053.99
5. Posey ZQ, Ahn HJ, Junewick J, et al. Rate and associations of epididymal cysts on pediatric scrotal ultrasound. *J Urol* 2010;184:1739–42. https://doi.org/10.1016/j.juro.2010.03.118

MP–7.12

Increasing retrospective detection of pediatric nephrolithiasis in children undergoing abdominal imaging at a Canadian pediatric tertiary care centre

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Introduction: There are very few studies evaluating the prevalence of nephrolithiasis in pediatric patients in Canada. Our objective was to estimate the prevalence of nephrolithiasis in patients undergoing abdominal ultrasound (US) or computerized tomography (CT) at the Children's Hospital of Eastern Ontario (CHEO) using textual analysis of abdominal imaging reports.

Methods: Radiology reports for all patients under 18 years of age having abdominal US or CT between January 1, 2011 and December 31, 2016 were retrieved. Using SAS, reports were flagged if they contained keywords (Table 1; available at https://cua.guide/) potentially indicating nephrolithiasis present. All flagged reports, as well as 10% of unflagged reports, were manually reviewed to confirm the presence or absence of a stone. Patient– and stone–related clinical data was extracted.

Results: A total of 2449 of 53 235 imaging reports cited at least one of the keywords. Initial manual review of reports identified 622 studies as potentially indicating stones. Of these, 498 studies had confirmed stones (275 unique patients). The prevalence of imaging reports reporting index stones increased from 488 to 1010 per 100 000 reports between 2011 and 2015 (Fig. 1; available at https://cua.guide/). One hundred sixty–five (60%) patients were first–time stones formers. The median age of new stone patients was 0.65 years (interquartile range [IQR] 0.32–13.4) for asymptomatic patients and 9.6 years (IQR 0.69–14.1) overall. One hundred eighteen stone patients (42.9%) were symptomatic, with pain (73%), hematuria (26%), urinary tract infection (24%), dysuria (11%), and/or nausea/vomiting (8%). Stone size was similar in symptomatic vs. asymptomatic stones (6.4 vs. 5.8 mm; p>0.05).

Conclusions: The prevalence of radiologically identified stones in children undergoing abdominal imaging at a Canadian pediatric tertiary care centre is increasing significantly over time. Despite the incidental nature of over half of the stones, a basic urological assessment, metabolic workup, and imaging until stone resolution are recommended for pediatric stone formers.

MP–7.13

Evaluating the robustness of the pediatric urology literature: A role for the Fragility Index

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Introduction: The use of threshold p values has been criticized as an overly simple concept to determine the true existence of a treatment effect. To better communicate the limitations of the p value is to report an additional metric that demonstrates how easily statistical significance based on a threshold p value may be exceeded (Fragility Index).

Methods: We reviewed all studies published in high–impact pediatric journals within the last five years that reported a statistically significant result for at least one dichotomous or time–to–event outcome. In the group with the smallest number of events, we changed the status of patients without an event to an event until the p value exceeded 0.05. The number of additional events was labelled the Fragility Index, smaller values representing a more fragile result. Linear regression models were employed to evaluate associations between the Fragility Index and trial characteristics.

Results: Of 609 abstracts reviewed, 92 studies were included in the final analysis, with a median patient sample size of 89.5 (range 15–6000). The mean Fragility Index was 3 (range 0–135); 60% of studies had a Fragility Index of 3 or less. A strong correlation was found between sample size and Fragility Index, meaning a smaller sample size was associated with a lower Fragility Index, and thus a more fragile result (r=0.50; p<0.001). Linear regression models demonstrated a statistically significant association between the presence of a biostatistician and the Fragility Index. Study design, allocation concealment, participant blinding, percent lost to followup, and level of evidence failed to show a statistically significant association with Fragility Index (Table 1; available at https://cua.guide/).

Conclusions: The Fragility Index complements the p value and helps identify less robust results. The statistically significant results of the pediatric urology studies reviewed appear to be quite fragile.

MP–7.14

Current practice patterns for simple renal cysts among pediatric urologists

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Introduction: Simple renal cysts (SRC) are rare in the pediatric population, with incidences ranging between 0.22–0.55%.[1,2] In practice, the management of SRC is widely variable, with no consensus on the frequency, duration, or criteria for further intervention. The aim of this study is to explore the current international practice patterns for SRC amongst pediatric urologists.

Methods: An online survey was developed and administered using SurveyMonkey comprising 21 questions and four clinical scenarios. Content and face validation of the survey was performed by five pediatric urologists. This survey collected both quantitative (Likert scale) and qualitative data (open–ended questions) aimed at assessing optimal imaging modality, followup period, and management. The survey was administered to members of the European Society of Pediatric Urology, American Association of Pediatric Urologists, and Pediatric Urologists of Canada. A total of 128 pediatric urologists responded, with a completion rate of 84%.

Results: The most commonly used imaging modality for followup was renal ultrasound (100%) performed, on average, every six months (50.7%). The indications for changing followup frequency were mass effect (89.6%), gross hematuria (88.7%), worsening renal function (75%), and urinary tract infection (43.9%). Most respondents followed asymptomatic children with stable SRC for 2–5 years before discharging them from their care (32%). Two respondents found malignancies during followup imaging.

Conclusions: This is the first study to explore international practice patterns for the management of SRC in the pediatric population. The intervention rate of these SRC is currently are unknown, however, the socioeconomic burden of the surveillance regime shown in this study is not trivial. In addition, although common themes were found for followup and treatment, practice patterns remain heterogeneous; as such, prospective studies or consensus from a working group are required for optimal management.

References:

1. McHugh K, Stringer DA, Hebert D, et al. Simple renal cysts in children: Diagnosis and followup with US. *Radiology* 1991;178:383e5.
2. Laucks Jr SP, McLachlan MS. Aging and simple cysts of the kidney. *Br J Radiol* 1981;54:12e4.

UP–7.1

A comparison of institutional and national differences in management of cryptorchidism among Canadian pediatric surgeons and pediatric urologists

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Introduction: Cryptorchidism (UDT) is a common congenital abnormality that is managed by pediatric urologists (U) and pediatric surgeons (S).[1] In the era of evidence–based medicine, clinical practice guidelines may improve healthcare outcomes by standardizing patient care.[2] Therefore, this project aims to evaluate whether a guideline is an effective tool of influencing practice at institutional and national levels by assessing differences in the management of UDT between U and S at the institutional and national (Canadian) levels of practice.
Methods: To assess the institutional practice patterns, a retrospective review of the electronic records of patients who underwent primary unilateral or bilateral orchidopexies at our centre between January 2012 and January 2014 was performed. To assess the national practice patterns, active members of Pediatric Urologists of Canada (PUC) and Canadian Association of Pediatric Surgery (CAPS) were invited to participate in a multiple–choice–type questionnaire with clinical scenarios in management of UDT.
Results: At our institution, 488 patients (616 testes) were identified; 405 (83.0%) and 83 (17.0%) were managed by U and S, respectively. With the national survey, there was a 74% response rate among CAPS members (54/73) and 79% response rates among PUC members (27/34). Table 1(available at *https://cua.guide/)* outlines the relevant guideline recommendations and the observed institutional practice patterns and preferred national practice patterns of U and S.
Conclusions: Despite some differences, the overall adherence to guideline recommendation observed from both institutional and national investigations were similar. The difference between the observed age at surgery institutionally and preferred age of surgery nationally may indicate that despite the 'preferences,' actual practice may be different. The high rates of preoperative ultrasound use may indicate that current guideline recommendations are ineffective at influencing established practice patterns based on experience.
References:
1. Sijstermans K, Hack WWM, Meijer RW, et al. The frequency of undescended testis from birth to adulthood: A review. *Int J Androl* 2008;31:1–11.
2. Kirkpatrick DH, Burkman RT. Does standardization of care through clinical guidelines improve outcomes and reduce medical liability? *Obstet Gynecol* 2010;116:1022–6. https://doi.org/10.1097/AOG.0b013e3181f97c62

UP–7.2
Practice variation on use of antibiotics: An international survey among pediatric urologists
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Introduction: The evidence for antibiotic prophylaxis after common pediatric urological procedures is limited and current practices on post–procedure prophylaxis may be variable among pediatric urologists (PU), without evidence–based support.[1] We aimed to evaluate the current practice pattern on antibiotic usage for common interventions among PUs practicing in four English–speaking, geographic sectors of the world.
Methods: A survey using multiple–choice options based on seven scenarios, primarily on clinical situations where a tube/catheter/stent is inserted and/or left indwelling, was disseminated to practicing members of the Pediatric Urologists of Canada (PUC) and Society of Pediatric Urology of Australia and New Zealand (SPUNZA), and all PUs attending the 2016 British Association of Pediatric Urology (BAPU) and 2017 American Association of Pediatric Urology (AAPU) meetings.
Results: A total of 126 respondents completed the survey (68.5% response rate) with ≥65% response rate from each sector. Across the groups, pre–incision prophylactic antibiotics were administered for J–J stent placement and before hypospadias surgery. Most PUs do not use continuous prophylactic antibiotics for indwelling urethral and suprapubic catheters, but do use antibiotics after hypospadias surgery where catheters/stents are left indwelling. The North American PUs demonstrated comparable practice patterns, which often differed significantly from those of the SPUNZA and BAPU PU. Specifically, a significantly larger proportion of the North American PUs do not use antibiotics for common procedures when compared to Australia, New Zealand, and the U.K.
Conclusions: Practice patterns in antibiotic usage among PUs vary widely based on geographic location of practice. This may be attributed to local 'culture' and training. With antibiotic stewardship being a significant focus in healthcare, there is a need to understand the reasons for such variation and to standardize antibiotic usage based on best evidence.
Reference:
1. Wolf JS, Bennett CJ, Dmochowski RR, et al. Best practice policy statement on urologic surgery antimicrobial prophylaxis. *J Urol* 2008;179:1379–90. https://doi.org/10.1016/j.juro.2008.01.068

UP–7.3
An epidemiological overview of a tertiary referral practice for male pediatric lichen sclerosus
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Introduction: Within the pediatric population, changing patterns of circumcisions have confounded the epidemiology and presentation of lichen sclerosus (LS). We sought to evaluate the incidence, demographics, and clinical features of patients presenting to a single Albertan pediatric urologist with LS.
Methods: This retrospective, descriptive analysis evaluated all pediatric patients referred for phimosis to a single pediatric urologist in Edmonton, Alberta, Canada. This surgeon routinely delivered foreskin specimens for pathology post–circumcision. Chief complaints/symptoms, date of birth, and date of circumcision were identified. Clinical suspicion of LS and pathological confirmation of the disease were documented. The primary outcome of interest was the proportion of circumcisions with pathologically confirmed LS.
Results: From July 2006 to March 2016, 4163 patients were seen for phimosis of the approximate 12 000 new referrals. One hundred phimosis patients had clinically suspected LS. Unfortunately, 17 (10.5%) patients were missing pathology specimens. Of those adequately reported, 81 (81/83) were microscopically confirmed to be LS, with a mean age of 9.6 years and median age of 8.9 years (range 4.1–16.1). This cohort represented 2.0% of phimosis referrals and approximately 0.7% of all referrals to our pediatric urologist. When compared to physiological phimosis, these patients had higher rates of dysuria (n=28, 34.6% vs. n=1, 1.0%; $p<0.0001$) and urinary retention (n=18, 22.2% vs. n=1, 1.0%; $p<0.0001$) as presenting complaints. The remainder of the patients presented due to painful erections (n=2, 2.5%), balanitis (n=2, 2.5%), and the inability to retract their foreskin (n=24, 29.6%), among other reasons (n=7, 8.6%).
Conclusions: LS of the pediatric male genitalia is an uncommon, albeit clinically significant disease entity. For the trained practitioner, the clinical diagnosis is very accurate.

UP–7.4
A pilot study using magnetic stents in pediatric patients
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Introduction: Ureteral stents with magnetic tips (Blackstar©) were recently approved for use in Canada. Traditionally, pediatric stent insertion and removal is done under general anesthetic. Unfortunately, general anesthetic has been associated with potential learning difficulty and developmental issues.[1] With magnetic stents shown to be safe and effective in adults and removable without general anesthetic,[2,3] these stents have potential to reduce anesthetic–associated morbidity in pediatric patients.

Methods: Postoperative ureteroscopy, ureteric re–implantation, and pyeloplasty patients at the Alberta Children's Hospital from September 2017 to January 2018 were included in this review. The magnetic stents used were from a product line produced for children with lengths varied from 12–24 cm. Patients ages ranged from 2–16 years and included both genders. Patients requiring stenting longer than four weeks were excluded. Blackstar© stents were removed using a magnetic retrieval device lubricated with 2% lidocaine jelly in clinic.

Results: A total of eight stents were used, of which seven were retrieved without needing endoscopy. The patient requiring cystoscopy for removal was a two–year–old male and was difficult to catheterize. There were no complications.

Conclusions: Magnetic stents may have the potential to reduce general anesthetic exposure for pediatric patients. At our centre, we were able to use these stents for anesthetic–free removal in a variety of pediatric procedures. This is the first report of successful use of Blackstar© magnetic stents in a pediatric population. We are currently working on a more comprehensive prospective study with parental survey data.

References:

1. Wilder RT, Flick RP, Sprung J, et al. Early exposure to anesthesia and learning disabilities in a population–based birth cohort. *Anesthesiology* 2009;110:796–804. https://doi.org/10.1097/01.anes.0000344728.34332.5d
2. Rassweiler MC, Michel MS, Ritter M. Magnetic DJ removal. *J Urol* 2014;191:949. https://doi.org/10.1016/j.juro.2014.02.2029
3. Rassweiler MC, Michel MS, Ritter M. Ureteral stent removal without cystoscopy. Poster presented at: World Congress of Endourology 2015 from the Department of Urology, Mannheim Germany.

Poster Session 8: Robotics/Other Urology Topics
June 26, 2018; 0800–0930

MP–8.1

Impact of the Rocco stitch on return to urinary continence following robot–assisted radical prostatectomy: Results of a prospective, longitudinal, randomized controlled trial

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Study Groups: The Masonic Foundation of Ontario.
Introduction: Urinary incontinence post–radical prostatectomy is a well–recognized complication. Twelve–month continence rates typically range from 85–95%, yet few patients are continent in the early postoperative period. Posterior reconstruction of the Denonvilliers' musculofascial plate, also referred to as the "Rocco stitch" technique, may improve early return to continence. We evaluated short– and long–term return to urinary continence post–robot–assisted radical prostatectomy (RARP) by comparing the Rocco stitch (intervention) vs. conventional urethrovesical anastomosis (UVA) (control).
Methods: Consecutive patients undergoing RARP were prospectively recruited in clinic and randomly allocated to either the intervention or control group and blinded to allocation status. All cases were performed by a single high–volume surgeon at a tertiary healthcare centre. Outcomes were assessed using the EPIC–26 form at baseline and two–, three–, four–, six–, eight–, and 12–month followup. Pad use and continence scores were compared using the Chi–square and Mann–Whitney U tests. An ordinal generalized estimating equation model assessed the treatment effect of the Rocco stitch on urinary continence over time.
Results: A total of 139 patients were included in the analysis (Rocco n=73; control n=66). Mean age was 63.2±8 years. No differences were found between groups for preoperative clinical and functional variables. Using a continence definition of ≤1 pad(s)/day, no significant differences were found between groups at any of the followup time points (Table 1; available at *https://cua.guide/*). Frequency of urine leak, quantity of pad use, subjective urinary control, and overall bother improved significantly in all patients during the study period (p<0.001). The 12–month continence rate for the Rocco group was 93.0% vs. 85.7% for the control group (p=0.258).
Conclusions: The use of the Rocco stitch showed no statistical significance in shortening time to urinary continence post–RARP when compared to conventional UVA. Larger, multicentre studies are required to support these findings.

MP–8.2

Risk factors for deviation of planned nerve preservation during robotic radical prostatectomy

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Introduction: Robot–assisted radical prostatectomy (RARP) enhances surgical precision of nerve preservation (NP) in localized prostate cancer treatment. Studies have shown the effect on surgical margins and functional outcomes of protocol use for NP planning.[1] Despite protocol use, many planned NP techniques change intraoperatively. Currently, no published work evaluates preoperatively planned and executed NP in RARP or risk factors for deviation. Our study aims to identify risk factors of intraoperative change in NP technique.
Methods: Prospective data of 578 RARPs performed by one surgeon (KCZ) at an academic centre were reviewed. NP was planned preoperatively using an institution–adopted protocol. Age, body mass index (BMI), prostate–specific antigen (PSA), cStage, prostate size, number of lifetime biopsies, post–biopsy sepsis, Gleason score, Sexual Health Inventory for Men (SHIM) score, and time from biopsy to surgery were compared to change in NP. Surgical techniques were NP (interfascial resection) or nerve resection (NR) (extrafascial resection). Significant/near–significant predictors on univariate regression underwent multivariate analysis.
Results: A total of 271(46.9%) cases underwent some intraoperative change in NP from preoperative plan; 234 were to any unplanned NR, with 98 to bilateral NR. Age, prostate size, Gleason score, cStage, SHIM score, and post–biopsy sepsis were significant univariate predictors of additional NR. On multivariate analysis,Gleason ≥7 and older age were significant predictors of unplanned NR. Older age and post–biopsy sepsis were significantly associated with more unplanned bilateral NR. There were no predictors of unexpected NP.
Conclusions: Our study provides a first insight into factors leading to change in NP surgical planning in RARP, directly affecting functional outcomes. Older age, Gleason ≥7, and post–biopsy sepsis were significant predictors of more unplanned NR, which should guide counselling of risks and functional outcomes. Finally, number of lifetime biopsies had no effect on NP, suggesting that more biopsies in actively surveilled patients may not lead to more unplanned NR.
Reference:
1. Zorn K, Gofrit O, Steinberg G, et al. Planned nerve preservation to reduce positive surgical margins during robot–assisted laparoscopic radical prostatectomy. *J Endourol* 2008;22:1303–9. https://doi.org/10.1089/end.2008.0009

MP–8.3

Randomized control trial evaluating the utility of verapamil in perfusate solution during pulsatile perfusion in renal transplants

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Introduction: Contemporary kidney transplantation has seen dramatic improvements in acute rejection rates, but improving graft function/survival continues to be a challenge. The objective of our study was to evaluate whether the addition of verapamil into cold pulsatile perfusion solution can improve overall graft function or survival in renal transplant recipients.
Methods: Between October 2008 and September 2010, 30 patients receiving matched pair deceased donor organs were randomized to have verapamil infused into the perfusate during pulsatile perfusion of their kidneys. One kidney of the donor pair received 5 mg of verapamil, whereas the second kidney did not receive supplementation. Surgeons and physicians were blinded to the randomization.
Results: The study group contained 10 women and participants had an median body mass index of 27.6 and median age of 57 years. In terms of the transplanted organs, 24 were from donors after neurological death, 20 were from standard criteria donors, and median cold ischemia time was 1002 minutes. There were no significant differences between our recipients' demographic characteristics as a consequence of the matching process. There were no differences in groups for cold ischemia time or initial urine output. We found significant improvements in the estimated glomerular filtration rate (eGFR) at one year for individuals who received verapamil (0.84, 95%; p=0.04) but no difference in eGFR at two–year (0.84; p=0.12)

or five–year (0.83; p=0.18) followup. Pump time did not significantly predict rejection or graft survival. Five individuals experienced significant perioperative hypotension and a there was a total of six episodes of rejection during the study period. There were no significant differences between the two groups in complications or mortality.
Conclusions: The addition of verapamil in pumped kidneys resulted in significant improvements in one–year eGFR. This is the first randomized control trial examining this issue to date.

MP–8.4

Is access to robotic partial nephrectomy associated with use of partial nephrectomy or minimally invasive partial nephrectomy?

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Study Groups: Canadian Kidney Cancer information system (CKCis).
Introduction: Partial nephrectomy is the preferred surgical treatment for clinical stage T1 renal masses.[1] For some surgeons, robotic surgery may allow for more complex renal tumours to be resected using a laparoscopic approach.[2] The objective of this study was to determine if access to robotic partial nephrectomy is associated with the proportion of patients with cT1 treated with a partial nephrectomy or minimally invasive partial nephrectomy.
Methods: The Canadian Kidney Cancer information system (CKCis) is a multicentre, prospectively collected database of renal tumour patients initiated in 2011. A cohort of cT1 patients was reviewed to determine the proportions of patients managed with open or MIS (pure laparoscopic or robotic–assisted laparoscopic) partial nephrectomy. Surgical management at centres with access to robotic partial nephrectomy were compared to centres that did not have access to robotic partial nephrectomy.
Results: During the study period, 3546 cT1 patients had partial (2417, 68%) or radical (1130, 32%) nephrectomy. Nine of 16 centres had at least one year when robotic partial nephrectomy was performed. Centres with access to robotic partial nephrectomy more commonly performed partial nephrectomy compared to non–robotic centres (73% vs. 57%; p<0.001) and more commonly performed MIS partial nephrectomy (41% vs. 29%; p<0.001). Overall, 1262 (52%) patients had MIS partial nephrectomy and 1155 (48%) had open partial nephrectomy. Among partial nephrectomy patients, sites with access to robotic partial nephrectomy used an MIS approach in 57% of patients compared to non–robotic sites, where an MIS approach was used for 42% of patients (p<0.001).
Conclusions: Partial nephrectomy is the most common surgical management of patients with cT1 renal tumours. Centres with access to robotic partial nephrectomy more commonly perform partial nephrectomy and MIS partial nephrectomy compared to sites without access to robotic surgery. Further analyses, adjusting for years of robotic access, case mix, and case volume will aim to determine if the proportions of MIS partial nephrectomy increase after a robotic renal surgery program is initiated.
References:
1. Campbell SC, Novick AC, Belldegrun A, et al. Guideline for management of the clinical T1 renal mass. *J Urol* 2009;182:1271. https://doi.org/10.1016/j.juro.2009.07.004
2. Pak JS, Lee JJ, Bilal K, et al. Utilization trends and outcomes up to 3 months of open, laparoscopic, and robotic partial nephrectomy. *J Robotic Surg* 2017;11:223–9. https://doi.org/10.1007/s11701–016–0650–4

MP–8.5

Urological conditions in nonagenarians

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Introduction: The Canadian population is rapidly aging, with centenarians comprising the fasting growing age group nationally.[1,2] Sparse urological research exists on nonagenarians.[3,4] The purpose of our study was to assess the most common urologicalal referrals and diagnoses in nonagenarian patients. We also sought to determine which investigations and treatment modalities were used by urologists and how frequently management was altered due to patient age.
Methods: A retrospective chart review of all referrals in patients aged 90–99 at time of referral was carried out at a single academic institute. This included referrals to 11 urologists from 2007–2017. Electronic health records were reviewed.
Results: A total of 106 nonagenarian patients were identified (66% male; 34% female). Mean age at referral was 91.9 years. The most common reasons for referral for males were hematuria, lower urinary tract symptoms (LUTS), and urinary retention (27%, 20%, and 18%, respectively); for women, they were hematuria, urinary tract infections (UTI), and LUTS (33%, 22%, and 19%, respectively). After seeing the urologist, the most common male diagnoses were benign prostatic hyperplasia (BPH), stones, and urinary retention (20%, 16%, 13%, respectively). The most common female diagnoses were bladder tumour, UTI, and cystitis (22%, 11%, 9%, respectively). Flexible cystoscopy was used in 51% of males and 64% of females. Twenty–eight percent of females underwent computed tomography. Nineteen percent of men were managed with indwelling catheters and 20% of females were managed with antibiotics. In 18% of cases overall, the urologist deviated from gold–standard management due to the patient's advanced age. Only 10/15 patients diagnosed with bladder tumours underwent resection.
Conclusions: Nonagenarians referred to urology often present with common urinary symptoms. BPH, bladder tumours, and UTIs are common diagnoses in this population. Despite common diagnoses, at times, management plans vary due to very advanced age. Further research is ongoing to assess the management of nonagenarians.
References:
1. Government of Canada Statistics. Data products, 2016 census (Dec. 12, 2017). Available at www12.statcan.gc.ca/census–recensement/2016/dp–pd/index–eng.cfm. Accessed April 5, 2018.
2. Government of Canada Statistics. Centenarians in Canada. Dec 21, 2015. Available at www12.statcan.gc.ca/census–recensement/2011/as–sa/98–311–x/98–311–x2011003_1–eng.cfm. Accessed April 5, 2018.
3. Hosking MP, Warner MA, Lobdell CM, et al. Outcomes of surgery in patients 90 years of age and older. *JAMA* 1989;261:1909–15. https://doi.org/10.1001/jama.1989.03420130077027
4. Pridgeon S, Nagarajan E, Ellis G, et al. The use of urological hospital services by nonagenarians. *Ann R Coll Surg Engl* 2016;98:181–6. https://doi.org/10.1308/rcsann.2016.0002

MP–8.6

Incorporating measures of patient safety into technical skill assessments in robotic–assisted radical prostatectomy

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Introduction: The expansion of robotic surgery in urology has necessitated the creation of assessment tools to evaluate trainee and surgeon technical performance.[1] It remains unknown whether these assessments have any relationship with intraoperative adverse events (iAEs). We examine the correlative properties of global rating scales (GRS) and iAEs in a cohort of robotic–assisted radical prostatectomy (RARP) patients.

Methods: Intraoperative video from prospective, RARP cases at a single, quaternary referral cancer centre was collected sequentially. Expert video analysts blindly rated intracorporeal video, using the Global Evaluative Assessment of Robotic Skills (GEARS), the Prostatectomy Assessment of Competency Evaluation (PACE), and the Generic Error Rating Tool (GERT). The GERT is a validated tool that allows for detailed, objective quantification and categorization of iAEs, including surgeon technical errors. Spearmans rho correlations tested the association between performance and safety measures.

Results: A total of 38 RARP cases had complete assessment data for inclusion in the analysis. Overall GEARS score moderately correlated with overall PACE score (0.513; p=0.002) and had a weak but significant correlation with iAEs (–0.374; p=0.029) (Fig. 1; available at *https://cua.guide/*). Overall PACE score correlated with total surgeon technical error (–0.357; p=0.028) and total mechanical injury (–0.462; p=0.004). There were significant inverse correlations between GEARS scores and iAEs during the bladder drop (–0.341; p=0.039) and seminal vesicles (–0.502; p=0.002) steps, and GEARS scores and technical errors during the seminal vesicles (–0.457; p=0.004), apical dissection (–0.310; p=0.050), and urethrovesical anastomosis (–0.453; p=0.005) steps.

Conclusions: This is the first study to describe associations between iAEs and measures of surgeon technical performance in RARP. Future work in this space includes testing the predictive ability of these metrics on clinical and oncological outcomes.

Reference:

1. Hung AJ, Jayaratna IS, Teruya K, et al. Comparative assessment of three standardized robotic surgery training methods. *BJU Int* 2013;112:864–71. https://doi.org/10.1111/bju.12045

MP–8.7

Extracorporeal shockwave therapy for chronic pelvic pain in men: A long–term treatment option

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Introduction: Chronic pelvic pain syndrome (CPPS) is a frequent urological diagnosis that can affect the patient's quality of life.[1,2] Extracorporeal shockwave therapy (ESWT) is recently recognized as a treatment option for men with CPPS.[3] This study is aimed at evaluating the long–term efficacy of ESWT for the treatment of men with CPPS.

Methods: This prospective, self–controlled study included 34 patients who were diagnosed with CPPS at the outpatient department of a tertiary medical centre between June 2016 and July 2017. Patients were referred for ESWT and received four sessions one week apart by a protocoal of 3000 impulses, 0.25 mJ/m^2 and 3Hz frequency using Duolith SD1 Ultra Device (Storz Medical company, Tuttlingen, Switzerland). In addition to demographic and clinical data, patients' symptoms were assessed using the National Institute for Health–Chronic Prostatitis Symptom Index (NIH–CPSI) questionnaire on the initial visit, and three and six months after completing their ESWT treatment. Complications were also recorded.

Results: The patients' mean age was 39±7.6 years. Both diabetes mellitus and hypertension were reported by five patients. The mean duration of symptoms was 5±4.5 years. The NIH–CPSI scores are depicted in Table 1 (available at *https://cua.guide/*). One month after completing ESWT, 100% of patients reported an improvement in all the NIH–CPSI domains, with a mean improvement in total score of 9.7±6.3 points, in pain score of 5.3±3.9 points, in urinary symptom score of 0.9±2.2 points, and in quality of life score of 3.5±2.7. However, six months after completing ESWT, 79.4% of patients reported an improvement in all the NIH–CPSI domains, with a mean improvement in total score of 8±8.1 points, in pain score of 3.8±4.9 points, in urinary symptom score of 0.8±2.6 points, and in quality of life score of 3.5±3.1. None of the patients developed any treatment–related complications.

Conclusions: ESWT is a safe and effective treatment modality for patients with CPPS, with long–term improvement in symptoms.

References:

1. Schaeffer AJ. Epidemiology and evaluation of chronic pelvic pain syndrome in men. *Int J Antimicrob Agents* 2008;31: S108–11. https://doi.org/10.1016/j.ijantimicag.2007.08.027
2. Walz J, Perrotte P, Hutterer G, et al. Impact of chronic prostatitis–like symptoms on the quality of life in a large group of men. *Br J Urol Int* 2007;100: 1307–11. https://doi.org/10.1111/j.1464–410X.2007.07250.x
3. Zimmermann R, Cumpanas A, Milea F, et al. Extracorporeal shockwave therapy for the treatment of chronic pelvic pain syndrome in males: A randomized, double–blind, placebo–controlled study. *Eur Urol* 2009;56: 418–24. https://doi.org/10.1016/j.eururo.2009.03.043

MP–8.8

Antibioprophylaxis for transrectal ultrasound–guided needle prostate biopsy: Is prevention of post–procedural urinary sepsis improved with the novel combination of ciprofloxacin and fosfomycin?

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Study Groups: Mathieu Bettez, Jean Cossette, Benoit Guertin, Bechir Hage, Samer Hanna, Marie–Paule Jammal, Jean Simard.

Introduction: Prostate biopsy is performed to diagnose prostate cancer. Quinolones are recommended as first–line antibioprophylaxis (ATBPx) for transrectal ultrasound–guided prostate needle biopsy (PNB).[1,2] Recently, some authors have shown an increase in post–PNB infections associated with emergent quinolone resistance in *E. coli*, urging re–evaluation of ATBPx.[3]

Methods: Our objective was to compare the rate of post–PNB urosepsis associated with two regimens of ATBPx: oral ciprofloxacin (CIP) alone (Group 1) vs. oral CIP and fosfomycin (FOS) (Group 2). We performed a retrospective, pre–post intervention, quasi–experimental study on patients who underwent PNB from January 2012 to December 2015. ATBPx was changed from CIP to CIP/FOS in December 2013. Patients who consulted at the emergency for urosepsis within one month post–PNB were identified. Sepsis rates were analyzed using log–binomial regression considering the propensity scores weights of 14 known risk factors for post PNB infection.

Results: We reviewed charts of 2157 patients, including 1015 in Group 1 and 1142 in Group 2. The incidence of urosepsis in the CIP alone group was 1.2% (12/1015) and fell to 0.2% (2/1142) in the CIP/FOS group. Our analysis indicates that CIP/FOS significantly decreased the risk of sepsis compared to CIP alone (aRR=0.17; p=0.021). The pathogen was *E. coli* in 12/14 cases and seven strains were CIP–resistant. Seven cases also had *E. coli* bacteremia, with 5/7 blood cultures CIP resistant. Eleven of 12 *E. coli* were from Group 1 patients, including all blood culture and resistant isolates. One case of *B. fragilis* septicemia was identified in the CIP/FOS group. No cases of *C. difficile* diarrhea were identified at three months post–PNB.

Conclusions: The adoption of CIP/FOS as ATBPx in PNB significantly lowered our rates of post–procedural sepsis. Conveniently, this regimen is oral and obviates the need for rectal swab screening. Further prospective studies should be performed to confirm our findings.

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. Wolf JS, Bennett CJ, Dmochowski RR, et al. Best practice policy statement on urologic surgery antimicrobial prophylaxis. *J Urol* 2008;179:1379–90. https://doi.org/10.1016/j.juro.2008.01.068
3. Carignan A, Roussy J–F, Lapointe V, et al. Increasing risk of infectious complications after transrectal ultrasound–guided prostate biopsies: Time to reassess antimicrobial prophylaxis? *Eur Urol* 2012;62:453–9. https://doi.org/10.1016/j.eururo.2012.04.044

MP–8.9

Fosfomycin compared to standard of care, fluoroquinolone, prophylaxis for transrectal ultrasound–guided prostate biopsy: A systematic review and meta–analysis

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Introduction: Transrectal ultrasound (TRUS)–guided biopsy remains the commonest way of diagnosing prostate cancer. Rates of TRUS biopsy–related infectious complications have been on the rise secondary to fluoroquinolone (FLQ)–resistant bacterium. Using a meta–analysis approach, we sought to assess whether fosfomycin (FFM) represents a reasonable alternative to FLQ prophylaxis regimens.

Methods: Systematic review of Pubmed, Scopus, Embase, Web of Science, and clinicaltrials.gov up to December 25, 2017 was performed. Randomized controlled trials (RCTs) and observational studies (NRS) comparing FFM with FLQ for prophylaxis for TRUS biopsy were identified. Reviewers independently screened titles (JF, MM) and abstracted data (MM, POM). Primary outcome was biopsy–related sepsis or febrile urinary infection. Secondary outcomes were any urinary tract infection (UTI) and any complication. Meta–analysis performed using RevMan 5.3 with Mantel–Hanzel weighting and random effects models. RCTs and NRS were pooled separately and between–group heterogeneity was assessed. Where there was no significant heterogeneity, these results were pooled. Heterogeneity was quantified using I^2. Risk of bias assessed with Cochrane tool (RCT) and Newcastle–Ottawa Scale (NRS).

Results: We identified three RCTs (n=1383) and five NRS (n=42885). Prophylaxis with FFM was associated with decreased likelihood of the primary outcome of biopsy–related sepsis (combined result: odds ratio [OR] 0.42; 95% confidence interval [CI] 0.19–0.91; p=0.03; I^2=68%). Despite non–significant between group heterogeneity (p=0.23), the results of RCTs (OR 0.81; 95% CI 0.35–1.90; p=0.63; I^2=0%) and NRS (OR 0.32; 95% CI 0.09–1.11; p=0.07; I^2=82%) quantitatively differed. For the secondary outcome of any UTI, results favoured FFM (OR 0.30; 95% CI 0.15–0.62; p=0.001; I^2=55%) with no hetergeneity between study designs (p=0.51).

Conclusions: FFM is an alternative to FLQ prophylaxis for TRUS prostate biopsy with potential for lower rates of sepsis and infectious complications.

References:
1. Lavallée LT, Breau RH, Fergusson D, et al. Trends in prostate biopsy in Ontario, 1992–2014: A cohort study. *CMAJ Open* 2016;4:E698–705. https://doi.org/10.9778/cmajo.20160079
2. Nam RK, Saskin R, Lee Y, et al. Increasing hospital admission rates for urological complications after transrectal ultrasound–guided prostate biopsy. *J Urol* 2013;189:S12–7. https://doi.org/10.1016/j.juro.2012.11.015

MP–8.10

Duration of antibiotics in urinary stone–related urosepsis: An analysis of patients in a tertiary care centre

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Introduction: The optimal duration of antibiotics for patients with an obstructive infected urinary stone is not defined. We sought to compare the efficacy and safety of a short course of antibiotics (8–16 days) followed by an antibiotic–free period (Group 1) vs. continuous antibiotics until definitive stone management (Group 2) in septic patients with an obstructive urinary stone.

Methods: We conducted a retrospective, observational cohort study of adult patients admitted with an obstructive infected urinary stone. Consecutive patients in each group were selected according to a reverse chronological order of admission date starting January 2017. Endpoints included recurrent infections and stone/stent–related complications, among others.

Results: Out of 1770 visits based on ICD codes, 50 patients in Group 1 and 27 patients in Group 2 were identified. Patients in Group 2 had significantly higher American Society of Anesthesiologists (ASA) score (p=0.039), bloodstream infections (p<0.001), infectious diseases consultations (p<0.001), and were more frequently admitted to the intensive care unit (ICU) (p=0.020) compared to patients in Group 1. More recurrent infections prior to stone removal were observed in Group 1 vs.Group 2 (14% vs. 4%, respectively; p=0.248) (Table 1; available at *https://cua.guide/*). Subgroup analysis of patients admitted with a septic stone, but not requiring ICU admission, revealed more recurrent infections prior to stone removal in patients recieving short–course antibiotics as compared to continuous course antibiotics (13% vs. 5%, respectively; p=0.11).

Conclusions: Although statistical significance was not achieved and the sample size was small, the difference in recurrent infection prior to stone removal between the two groups was unexpected. This suggests that continuing antibiotics until definitive stone management may be beneficial. Our data provide an impetus to conduct a larger trial to further explore the optimal duration of antibiotics and timing of surgery to optimize the management of obstructive infected stones.

MP–8.11

Quantifying the 'assistant effect' in robotic–assisted radical prostatectomy: Measures of technical performance

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Study Groups: Michael Garron Hospital Educational Scholarship and Research Grant.

Introduction: While robotic–assisted surgery provides several advantages to the surgeon, it also requires the surgeon to be reliant on the bedside assistant for various steps of the procedure. Despite this, our ability to assess and understand the impact of the assistant on surgeon performance remains limited. We used a modified rating tool to quantify the effect of assistant skill on surgeon technical performance during robotic–assisted radical prostatectomy (RARP).

Methods: Prospective, intraoperative video from consecutive RARP cases at a quaternary cancer referral centre was collected. The prostatic pedicle and neurovascular bundle step (PPNVB) was chosen for analysis. Trained expert analysts scored the surgeon performance using the Global Evaluative Assessment of Robotic Skills (GEARS).[1] Assistant performance was rated using a modified Objective Structured Assessment of Technical Skills (aOSATS), comprised of four of the seven OSATS[2] domains. Spearmans rho correlations were used to test the relationship between assistant and surgeon technical performance.

Results: A total of 34 RARP cases had complete surgeon and assistant assessment data for analysis. Four experienced faculty (>50 cases) and 10 trainee bedside assistants were included in the study. Trainee experience ranged from 0 cases as bedside assist to more than 30. aOSATS score was significantly associated with bedside experience (p=0.001), console experience (p=0.005), but not prior laparoscopic experience (p=0.217). aOSATS score showed moderate positive correlation with surgeon GEARS score (0.533; p=0.001) (Fig. 1; available at *https://cua.guide/*).
Conclusions: This is the first study to assess the impact of assistant technical skill on surgeon performance in RARP. We have additionally provided validity evidence for a modified OSATS GRS for training and assessing bedside assistant performance. Our hypothesis–generating data suggests that bedside assistants must be technically skilled to allow the surgeon to perform at his/her best.
References:

1. 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
2. Martin JA, Regehr G, Reznick R, et al. Objective structured assessment of technical skill (OSATS) for surgical residents. *Br J Surg* 1997;84:273–8. https://doi.org/10.1002/bjs.1800840237

MP–8.12
Functional outcomes and postoperative complications in elderly patients (>70 years old) undergoing robotic–assisted radical prostatectomy

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Introduction: Urinary continence and erectile function following robotic–assisted radical prostatectomy (RARP) have significant impact on quality of life in patients with prostate cancer (PCa). We aimed to compare functional and perioperative outcomes, along with postoperative complications in elderly patients stratified by age.
Methods: A retrospective review of patients who underwent RARP between January 2007 and April 2017 was performed. Patients over 65 years of age were selected (n=280) and then stratified according to age 66–69 years old (n=197) or age ≥70 years old (n=83). Continence was defined as 0 pad per day usage and potency as Sexual Health Inventory for Men (SHIM) score ≥20. Perioperative, postoperative, and functional outcomes were assessed. Kaplan–Meier (KM) method was used to estimate time to recovery of continence in both groups.
Results: In the 66–69–year old group, continence rates at one, three, six, nine, and 12 months were 41%, 63%, 74%, 82%, and 87%, respectively. Continence rates in the ≥70–year–old group were 29%, 51%, 63%, 64%, and 65%, respectively. KM estimates demonstrated significantly superior continence outcomes in the groups of patients aged 66–69 years (p–log–rank=0.012) (Fig. 1; available at *https://cua.guide/*). In the 66–69–year–old group, 10% of patients who had unilateral nerve–sparing and 9% of patients who had bilateral nerve–sparing were potent at 18 months. None of the patients who had unilateral nerve–sparing and 17% of patients who had bilateral nerve–sparing were potent at 18 months in the ≥70–year–old group. Clavien I–II accounted for the majority of postoperative complications and Clavien III–IV for less than 2.5% of all complications.
Conclusions: Our results suggest that RARP is safe in all groups of elderly patients. Urinary continence outcomes differ significantly according to age, with better return of urinary function in elderly patients 66–69 years old compared with those 70 years or older.

UP–8.1
Robotic vs. open surgery in urology: A systematic review with meta–analysis of randomized control trials

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Introduction: Minimally invasive robotic surgery (RS) has gained favour as an alternative to open surgery in urological procedures, in particular radial prostatectomy and cystectomy.[1] Previous systematic reviews have been restricted to comparing outcomes for one specific procedure.[2] This paper aims to systematically review and analyze outcomes that are common regardless of the procedure.
Methods: A search was performed in electronic databases and studies were screened for relevance by two authors. The inclusion criteria included randomized controlled trials (RCTs) with a minimum 12–week followup, comparing open to robotic urological surgery, published from 2000–2017. Included studies were assessed for risk of bias. The data was extracted, and statistical analysis performed using RevMan 5.3 software. A random effects model was used.
Results: Included for analysis were seven RCTs involving 1054 patients (508 prostatectomy, 546 radical cystectomy) that met the eligibility criteria. RS was associated with reduced intraoperative estimated blood loss (EBL) (mean difference 417 ml; p=0.001; 95% confidence interval [CI] –667.69 to –165.37), and shorter hospital stay (mean difference 1.1 days; p=0.04). There was no difference in complications (RS 162 events vs. open surgery 181 events; relative risk [RR] 0.9; 95% CI 0.75–1.07; p=0.22) or operative time (mean difference 49.6 minutes longer for RS; p=0.05; 95% CI –1.02 to 100.21). There were more positive surgical margins in the RS group (68 vs. 49), with this result approaching statistical significance (p=0.06; RR 1.39; 95% CI 0.98–1.96).
Conclusions: Compared to open surgery, RS has a number of advantages, including a statistically significant improvement in EBL and shorter hospital stay. There were no differences in complications or operative time. While not statistically significant, the studies suggest a potential positive correlation between RS and positive surgical margins. The differences in this outcome are potentially clinically relevant and justify further evaluation.
References:

1. Gonzalez P, Queralt P, Bayarri S, et al. Evolution of open vs. laparoscopic/robotic surgery: 10 years of changes in urology. *Actas Urol Esp* 2010;34:223–31. https://doi.org/10.1016/S2173–5786(10)70053–6
2. Steffens D, Thanigasalam R, Leslie S, et al. Robotic surgery in uro–oncology: A systematic review and meta–analysis of randomized controlled trials. *J Urol* 2017;106:9–17. https://doi.org/10.1016/j.urology.2017.03.015

Poster Session 9: Incontinence
June 26, 2018; 0800–0930

MP–9.1
Metabolomic analysis of candidate urinary markers of overactive bladder syndrome in an aging female population: Pilot prospective study

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Study Groups: Metabolomics Core Facility, Goodman Cancer Research Centre, Montreal–Qc, Quebec Network for Research on Aging – Incontinence Thematic Group.
Introduction: Overactive bladder syndrome (OAB) is strongly associated with aging and metabolic syndrome. However, the exact links remain to be clarified. Urinary metabolome is a useful tool to diagnose metabolic alterations that can impact bladder physiology. We aim to identify specific metabolic markers of OAB using urine metabolomics of an aging female population.
Methods: Forty female patients (20 OAB patients and 20 healthy subjects) between the age of 50 and 80 years old underwent clinical evaluation and lower urinary tract symptoms assessment with Overactive Bladder Symptom Score (OABSS), International Consultation on Incontinence–Short Form (ICIQ–SF), and Incontinence Impact Questionnaire (IIQ–7), a three–day voiding diary, and blood sampling. Early morning midstream urine samples were collected for culture and metabolomics analysis. The urinary metabolome was analyzed by gas chromatography–mass spectrometry. ANCOVA was performed to control for the effect of age.
Results: Patients in the OAB group had a significant higher mean age, reflecting a higher prevalence in the elderly (56.3 years ± 5.2 control vs. 68.9 ± 11.4 OAB; $p<0.001$). Serum analysis showed a higher insulin resistance index (HOMA–IR) and serum urea in the OAB patients when controlled for age (Table 1; available at *https://cua.guide/*). Urine metabolomic analysis showed higher levels of urinary mitochondrial dysfunction (itaconic, malic and fumaric acids), oxidative stress (L–pyroglutamic and a–hydroxyglutaric acids), and ketosis (β–hydroxybutyric and hydroxyisobutyric acids) intermediates in OAB patients, with values correlating significantly with OAB symptoms (Table 2; available at *https://cua.guide/*). Multiple linear regression model showed that age, blood glucose, and urine metabolites (malic, fumaric, and hydroxyisobutyric) are predictor factors of OAB severity assessed by questionnaire scores.
Conclusions: OAB patients showed increased insulin resistance and higher urinary metabolic stress intermediates that correlated significantly with the severity of OAB symptoms. This study proposes new metabolites to serve as biomarkers of OAB and explains its link to metabolic syndrome.

MP–9.2
Long–term outcomes of sacral neuromodulation: A 23–year experience

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Introduction: Sacral neuromodulation (SNM) has been found effective for the treatment of overactive bladder (OAB), urgency urinary incontinence, interstitial cystitis (IC), and voiding dysfunction (VD). Several studies show the safety and efficacy of SNM at short– and medium– term followup.[1–3] In this study, we review the long–term outcomes and complications of SNM treatment for any indication.
Methods: This was a retrospective study of all patients who underwent test–phase (peripheral nerve evaluation [PNE] and/or first–stage procedure) and then SNM by a single surgeon from 1994–2017. The primary outcome was to assess long–term outcomes of SNM using the global response assessment scale. This included percent improvement in pain, as well as storage and voiding lower urinary tract symptoms. Secondary outcomes included number of revisions, reason for revision, complications, and rate of device removal.
Results: A total of 435 patients were included, with 374 (85%) female and 61 (15%) male patients. All patients underwent test phase and 236/435 (54%) patients eventually received a SNM implant. Mean age at time of implant was 48 years. Mean followup time was 5.7 years (1 month–20 years). Seventy–two of 36 (30%) devices were removed due to device failure, complication, and/or no improvement in symptoms; 169/236 (71%) patients underwent at least one followup surgical revision and 81/236 (34%) patients underwent more than one revision. The mean percentage improvement in symptoms on the last followup (mean 6.4 years) for patients with successful SNM was 69%.
Conclusions: Traditionally, patients with OAB, VD, and IC who failed conservative measures were left only with highly invasive options, such as augmentation cystoplasty and urinary diversions. In this chart review, we find that SNM is an effective option prior to major surgical interventions. There is a high revision rate, but overall, SNM is a minimally invasive procedure with a good safety profile and excellent long–term outcomes.
References:
1. Marcelissen T, Leong RK, de Bie RA, et al. Long–term results of sacral neuromodulation with the tined lead procedure. *J Urol* 2010;184:1997–2000. https://doi.org/10.1016/j.juro.2010.06.142
2. Al–zahrani AA, Elzayat EA, Gajewski JB. Long–term outcome and surgical interventions after sacral neuromodulation implant for lower urinary tract symptoms: 14–year experience at 1 centre. *J Urol* 2011;185:981–6. https://doi.org/10.1016/j.juro.2010.10.054
3. Van Voskuilen AC, Oerlemans DJAJ, Weil EHJ, et al. Long–term results of neuromodulation by sacral nerve stimulation for lower urinary tract symptoms: A retrospective single–centre study. *Eur Urol* 2006;49:366–72. https://doi.org/10.1016/j.eururo.2005.11.009

MP–9.3
Effects of baseline body mass index and overactive bladder duration on onabotulinumtoxinA efficacy and safety in patients with overactive bladder

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Study Groups: Funding: Allergan plc.
Introduction: We evaluated the effects of baseline overactive bladder (OAB) duration and body mass index (BMI) on onabotulinumtoxinA (onabotA) efficacy and safety in a large population of OAB patients with urinary incontinence (UI).

Methods: OAB patients who received onabotA 100 U in three randomized, placebo–controlled phase 3 trials and a post–marketing study were stratified by baseline OAB duration (<2 [n=279], 2–5 [n=641], and >5 [n=505] years) and BMI (<25 [n=317], 25–<30 [n=454], 30–<40 [n=502], and ≥40 [n=153] kg/m^2). Week 12 assessments: change in UI episodes/day, proportions of patients with 100% UI reduction, and change in King's Health Questionnaire (KHQ) domains. Rates of clean intermittent catheterization (CIC) and adverse events (AEs) were also recorded.
Results: The mean/percent changes from baseline to Week 12 in UI episodes/day with onabotA were –3.3/–54.5%, –2.9/–55.1%, and –3.4/–61.1% in patients with OAB duration of <2, 2–5, and >5 years, respectively (baseline: 5.3, 5.4, and 5.6), and –2.8/–57.9%, –2.8/–56.4%, –3.4/–55.5%, and –4.2/–63.1% with BMI <25, 25–<30, 30–<40, and ≥40 kg/m^2, respectively (baseline: 5.0, 5.2, 5.7, and 6.5). Proportions of patients with 100% reduction in UI episodes/day were 38.7%, 27.9%, and 27.9% by OAB duration (<2, 2–5, and >5 years, respectively) and 32.5%, 31.1%, 29.9%, and 22.9% by BMI (<25, 25–<30, 30–<40, and ≥40 kg/m^2, respectively). KHQ Role and Social Limitations improvements were ~4–6 times the minimally important difference (–5 points) across all groups. CIC was used in 6.1%, 4.4%, and 5.0% of patients with OAB duration <2, 2–5, and >5 years, respectively and in 4.7%, 5.3%, 5.4%, and 2.6% of those with BMI <25, 25–<30, 30–<40, and ≥40 kg/m^2, respectively. No unexpected safety signals were observed.
Conclusions: OnabotA 100 U reduced UI episodes, improved quality of life, and was well–tolerated regardless of baseline OAB duration or BMI. Baseline OAB duration and BMI did not appear to affect onabotA efficacy.

MP–9.4
Risk of clean intermittent catheterization was not increased with onabotulinumtoxinA re–treatment: Pooled analysis of randomized controlled trials

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Study Groups: Funding: Allergan plc.
Introduction: This post–hoc analysis of pooled placebo–controlled trials was undertaken to evaluate the risk of clean intermittent catheterization (CIC), as well as efficacy and quality of life (QOL) outcomes following onabotulinumtoxinA (onabotA) re–treatment.
Methods: Overactive bladder (OAB) patients who received onabotA 100 U in three randomized, placebo–controlled, phase 3 trials and a post–marketing study were included. CIC incidence was evaluated at week 12 following treatment cycles 1 and 2. In each study, patients could be retreated as needed/requested if they met the predefined criteria. The mean change from baseline (BL) in urinary incontinence (UI) episodes/day, proportions of patients with 100% reduction in UI (i.e., "dry"), and mean changes from BL in King's Health Questionnaire (KHQ) Role (RL) and Social Limitations (SL) domains were assessed at week 12 after treatment cycles 1 and 2. Adverse events (AEs) were recorded.
Results: CIC rates in the first 12 weeks following the first treatment were 5.3% (44/825) for onabotA and 0.1% (1/727) for placebo. In the 12 weeks after the second treatment, CIC rates were 5.3% (25/469) for those who received onabotA in both treatment cycles; the majority were de novo CIC patients (17/469, 3.6%). Only eight patients who received onabotA treatments twice required CIC within 12 weeks following each treatment. Correspondingly, the CIC rate was 3.1% (18/582) for those patients who received their first onabotA treatment in cycle 2. Mean change in UI episodes/day from BL (5.4) to 12 weeks was –2.9 after onabotA treatment cycle 1 and –3.5 after treatment cycle 2; 29.1% and 27.1% of patients, respectively, were dry. Mean changes from BL to 12 weeks in KHQ RL and SL were –21.9 and –21.6, respectively, after treatment cycle 1 and –23.3 and –22.7 after treatment cycle 2. Urinary tract infection was the most common AE.
Conclusions: In this large, pooled population of OAB patients, UI and QOL improvements were consistent with onabotA retreatment and were not accompanied by any increased risk of CIC.

MP–9.6
The majority of overactive bladder patients do not require specialist care

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Study Groups: Pfizer Canada Inc.
Introduction: Overactive bladder (OAB) is a common condition resulting in a significant number of referrals to specialists. Guidelines recommend patient education and conservative measures prior to medication or invasive techniques to manage OAB. We have established a multidisciplinary model of care employing non–specialist providers in the initial management of these patients. We set out to assess patient–reported outcomes (PROs) and satisfaction associated with this model.
Methods: From December 2014 to October 2016 patients referred to our clinic with OAB symptoms were prospectively enrolled. PROs (OAB v8, International Prostate Symptom Score [IPSS]) were collected at initial consultation. PROs and patient satisfaction (Consumer Assessment of Healthcare Providers and Systems [CAHPS]) were assessed at subsequent followup visits for 12 months. Those who did not return for a followup visit were mailed a survey package at 12 months. Changes in PROs were assessed using a paired t–test. Conservative therapies and medications used were assessed for change in PROs using ordinary least squares.
Results: Of the 301 patients enrolled, 201 (66%) were managed by non–specialist providers without the need to see a urologist. Baseline and end of study PRO and CAHPS data were available for 135 (67%) of these patients. Change in PROs showed statistically significant improvement over the 12–month period. The mean OAB v8 and IPSS scores improved by 5.4 and 4.3, respectively ($p<0.001$ for each). No single conservative therapy or medication made a statistically significant improvement in PROs on univariate analysis. Patient satisfaction based on CAHPS overall rating was high (8.9/10).
Conclusions: The majority of OAB patients do not require management by a specialist to achieve a satisfactory outcome .

MP–9.7
Preoperative pad usage is independently associated with failure of non–adjustable male transobturator slings in otherwise well–selected patients

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Introduction: The purpose of this study is to determine which clinical factors are associated with non–adjustable transobturator sling failure in properly selected men undergoing treatment for post–prostatectomy incontinence (PPI).
Methods: A retrospective review of Advance/Advance XP transobturator male sling procedures for PPI was performed over a 10–year period. Patients with known risk factors for sling failure, including severe incontinence (>5 pads), radiation therapy, untreated detrusor overactivity, or neurogenic detrusor dysfunction, were excluded from the study. Clinical factors examined were patient age, Charlson Comorbidity Index (CCI), diabetes, obesity (body mass index [BM] I>35), type of prostatectomy, and number of preoperative pads. The primary outcome measure was failure to achieve continence, defined as one or less pads postoperatively if preoperative pads were ≥2, or 0 pads if preoperative pad use was one. Descriptive statistics and univariate and multivariate Cox regression analysis was performed using SPSS24.
Results: Out of 158 patients, continence was achieved in 82.3% (n=130)

with a mean followup of 42.7 months. Mean pad usage preoperatively was 2.8 pads per day with a mean change of 2.1±1.3 pads. Patient satisfaction was 86.7% (n=137) and complications (any Clavien grade) occurred in 17.1% (n=27) of patients. On univariate Cox regression analysis, increasing age (p=0.02), CCI (p=0.02), and preoperative pad use (p<0.0001) were associated with failure to achieve continence, whereas obesity (p=0.95), diabetes (p=0.49), and type of prostatectomy (p=0.88) were not. On multivariate analysis, increasing preoperative pad usage remained associated with failure to achieve continence (hazard ratio [HR] 1.3; 95% confidence interval [CI] 1.1–16; p=0.008), while patient age (p=0.29) and CCI (p=0.10) did not. Patients wearing more than three pads per day were more likely to experience failure (35.5% vs. 13.4%; p=0.007).

Conclusions: Increasing preoperative pad usage is independently associated with an increased risk of failure after non–adjustable sling for PPI in otherwise well–selected patients. In particular, over 1/3 of patients using more than three pads per day failed to achieve continence and may be better managed by other means, such as an adjustable sling or an artificial urinary sphincter.

MP–9.8

The effect transcorporal cuff placement on artificial urinary sphincter outcomes in patients with a "fragile urethra"

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Introduction: The artificial urinary sphincter (AUS) is the gold standard for treatment of post–prostatectomy incontinence. However, patients with a "fragile urethra" (prior radiation, AUS, or urethroplasty) are at increased risk of AUS failure. Our objective is to assess overall outcomes and transcorporal cuff outcomes in patients undergoing AUS with a "fragile urethra."

Methods: We reviewed postoperative outcomes of patients with a fragile urethra (defined as a history of radiation, previous failed AUS, or previous urethroplasty) undergoing treatment with an artificial urinary sphincter for post–prostatectomy incontinence from 2004–2017. The primary outcome was the need for AUS revision. Secondary outcomes included change in pad use, patient satisfaction, continence (defined as requiring ≤1 pad), improvement (≥50% change in pad use), and erosion rates. Other patient demographics included age, diabetes, obesity (body mass index [BMI] >35), Charlson Comorbidity Index, salvage/adjuvant radiotherapy, previous AUS, previous urethroplasty, and type of prostatectomy. Mean pad change was compared with t–tests. Patient satisfaction, continence, and improvement rates were evaluated with Chi–square, while revision and erosion rates were compared using the log–rank test.

Results: A total of 76 sphincters were placed in fragile urethras, with a mean age of 71.6 years and a mean followup of 37.9 months. Mean preoperative pad use was 6.4 pads/day (2–12), 72.4% of patients reported severe incontinence (>5 pads/day), 42.1% had salvage/adjuvant radiotherapy, 56.6% had failed prior AUS, and 19.7% had prior urethroplasty. Postoperative pad use was 0.9 (0–5) (p<0.0001) for a mean pad change of 5.5 pads per day. Overall improvement rate was 93.4%, 71.1% reported continence, and 73.6% of patients were satisfied with the results of surgery. The revision rate was 31.6% and cuff erosion rate was 14.5%. A total of 31.6% of cases underwent transcorporal cuff placement (n=24) and those patients had lower revision rates (20.8% vs. 36.5%; p=0.05), greater change in pad use (6.5 vs.5.0; p=0.02), and a trend toward lower erosion rates (8.3% vs. 17.3%; p=0.09). There were non–significant differences in continence (66.7% vs. 73.1%; p=0.57), improvement (100% vs. 90.4%; p=0.17), and satisfaction (82.6% vs. 69.4%; p=0.26).

Conclusions: The AUS is a viable treatment option for post–prostatectomy incontinence even in patients with a fragile urethra. Use of a transcorporal cuff may be associated with lower revision rates, greater reduction in pad usage, and lower urethral erosion rates.

MP–9.9

Where are they now? Long–term adherence to intravesical onabotulinumtoxinA

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Introduction: OnabotulinumtoxinA (BoNT–A) is approved for the treatment of refractory idiopathic overactive bladder (iOAB) and neurogenic detrusor overactivity (NDO). The purpose of this study was to investigate long–term adherence to BoNT–A therapy and reasons for discontinuation.

Methods: We performed a retrospective cohort analysis of all patients who received either a first injection or any repeat injection of BoNT–A in 2013 and followed them until 2017 or booked for injection in 2018. Data regarding the indication for and dose of BoNT–A, need for clean intermittent catheterization (CIC), as well as any patient–reported outcomes was collected.[1,2] Parametric t–tests were used to determine statistical differences between cohorts. For all tests, a p–value <0.05 was considered statistically significant.

Results: Our cohort was comprised of 274 patients, 197 (71.9%) female, and mean age was 58.7 years (range 22–94). The indication for BoNT–A was: NDO in 151 (55.1%), iOAB in 106 (38.7%), and 17 (6.23%) had another indication, such as painful bladder syndrome/interstitial cystitis (PBS/IC). Of the 274 patients who received BoNT–A in 2013, 189 (67.9%) received an injection in 2017 or are booked for repeat injection in 2018. Adherence was higher in patients with NDO in comparison to patients with iOAB (72.8% vs. 63.2%; p=0.053), and the lowest in patients with PBS/IC (52.9%). In our cohort, 105 patients (38.7%) received their first BoNT–A injection in 2013, and 48 (44.8%) completed both a before and after patient perception of bladder condition (PPBC) survey, while 20 (19.0%) completed an eight–item overactive bladder questionnaire (OAB V8). There was a significant reduction in the mean PPBC score following BoNT–A (4.32 vs. 3.23; p<0.01), as well as the OAB V8 score (25.7 vs. 21.0; p<0.05). For the 139 (50.7%) patients who were previously voiding spontaneously, 41 (29.5%) patients initiated CIC: 27 (65.9%) had iOAB, nine (22.0%) had NDO and six (14.6%) had PBS/IC. For NDO, the most common reason for discontinuation was undocumented for 17 (41.5%) patients, while 12 (30.8%) iOAB patients changed their preference. BoNT–A was discontinued due to a lack of efficacy for five patients (12.2%) with NDO and five patients (12.8%) with iOAB.

Conclusions: The results indicate that BoNT–A adherence is good, but higher in NDO than iOAB, and overall, two–thirds of patients continue therapy a minimum of five years following initiation. The most common reason for discontinuation was a change of management for NDO vs. a change in patient preference in iOAB.

References:

1. Coyne KS, Matza LS, Kopp Z, et al. The validation of the patient perception of bladder condition (PPBC): A single–item global measure for patients with overactive bladder. *Eur Urol* 2006;49:1079–86. https://doi.org/10.1016/j.eururo.2006.01.007
2. Peterson AC, Sehgal A, Crump RT, et al. Evaluating the 8–item overactive bladder questionnaire (OAB–v8) using item response theory. *Neurourol Urodyn* 2017. Epub ahead of print. https://doi.org/10.1002/nau.23420

MP–9.10

The burden of overactive bladder in Canada: An examination of prevalence over time and healthcare resource use

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Introduction: The prevalence of overactive bladder (OAB) increases with age, and country–specific estimates of burden are dependent on demographic distributions. Estimates of the clinical and economic burden are not available for Canada. The objective of this study was to characterize the clinical and economic burden of OAB over time in Canada using provincial population–based administrative datasets.

Methods: Using sample datasets from 2006–2015 from the Régie de l'assurance maladie du Québec (RAMQ), outcomes were assessed among a cohort aged ≥18, and a subset aged ≥65. The OAB cohort, which was defined by two or more outpatient billing codes or prescription of an OAB–specific medication, was compared to an age– and sex–matched sample of the general population without OAB. We used a random sample of outpatient and medication data for 125 000 individuals across all cohorts, with denominator details included, allowing for population–level extrapolation. Prevalence was calculated based on the number of individuals meeting inclusion criteria for OAB, relative to the overall population. Healthcare resource use and costs were identified from any individual physician billing and pharmaceutical records among the OAB and comparison cohorts during the period.

Results: Prevalence ranged from 0.39% in 2006 to 1.98% in 2015, and 1.30% in 2006 to 5.15% in 2015 in the ≥18 and ≥65 OAB cohorts, respectively. Healthcare resource use among the OAB cohort was notably higher. In the first year, the patient had either one eligible prescription or the first of two eligible diagnoses (index year), the OAB cohort had more outpatient visits than the comparison cohort (29 vs. 17; $p<0.01$), and a higher number of prescriptions filled (25 vs. 16; $p<0.01$).

Conclusions: In Quebec, Canada, the prevalence of diagnosed OAB is increasing over time and is associated with increased burden on healthcare resources.

MP–9.11

Durability hemi–Kock continent stoma with cystoplasty in neurogenic bladder dysfunction

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Introduction: The management of patients with neurogenic bladders who require but cannot perform urethral clean intermittent catheterization (CIC) is facilitated by surgical creation of a continent abdominal access. A cohort of patients who underwent a continent cutaneous bladder stoma was analyzed to assess long–term durability and the need for revisional surgery.

Methods: A total of 88 patients, 66 women and 22 men (mean age 36.6 years, range 18–69), underwent the surgery, primarily for intractable urinary incontinence. Diagnoses were spinal cord injury (44), spina bifida (23), MS (6), transverse myelitis (2), and other neurological causes (16). During the surgery, in addition to the intussuscepted ileal segment continent bladder stoma, 84 patients had a cystoplasty with adjacent ileum and four had sigmoid cystoplasty. To address urethral incompetence, in the women, 34 had bladder neck (BN) slings, 14 had slings with BN tapering, and nine had BN closure; in the men nine had BN slings with tapering and three had BN closure. Stomal and valve revision rate, surgical re–interventions, and overall success were analyzed based on prospectively collected data. Success was defined as persistence with CIC and social continence.

Results: Mean followup was 8.6 years (range 0.33–27.2). All of the patients, except two quadriplegic females, carried out their own stomal IC. Bladder capacity increased significantly (203 cc to 433 cc), while pressure at capacity decreased from 37 cm water to 9 cm water ($p<0.0001$). At last followup, 77 (87.5%) were managing with CIC ± pads. Eleven (12.5%) were failures and of these, seven had indwelling catheters and four had ileal conduits. Thirty–two patients (36%) have not required any additional surgery, 37 (42%) have had endoscopic procedures for bladder stones, 25 (12%) required open surgery, including valve revision (13), BN procedure (4), ileal conduit (4), stomal hernia (2), and early perforation (2). Three patients died from unrelated causes and one from urothelial cancer after 15 years. Two women had full–term pregnancies. No other significant morbidity has been seen.

Conclusions: This procedure is a good option with long–term durability in patients who require a continent abdominal access to their bladders. Leaving urethral access and/or having a large catheterizing channel facilitates endoscopic procedures if required.

MP–9.12

The bladder management experiences of spinal cord injury patients: A systematic review of qualitative studies

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Study Groups: Dr. McGarry was supported by a CUA Pfizer Incontinence Grant.

Introduction: Qualitative research is well–suited to identify a person's beliefs, principles, feelings, and motivations that explain behaviour. We systematically reviewed the qualitative literature on spinal cord injury (SCI) and bladder management to better understand how SCI patients choose a bladder management method.

Methods: We searched EMBASE, CINAHL, and PsycINFO. Two reviewers independently examined the papers to identify those that met our inclusion criteria. This systematic review was prospectively registered at PROSPERO, and a predetermined data extraction template was used.

Results: We identified 412 studies and included 11 studies (n=443 people). Of these studies, 6/11 included predominately SCI patients. Age range was 19–96 years, duration of catheter use was <1–40 years, and the majority were male (67%). Most studies used semi–structured focus groups to gather information. Several common themes emerged from these studies. Participants commonly described physical and social limitations associated with catheters. A negative impact on intimacy and embarrassment/anxiety around public exposure of catheters was also commonly discussed. Participants described undergoing a process of normalization. This process is impacted by intermittent catheter barriers (such as no appropriate public facilities, difficulties because of spasticity, fear of inadvertent self–harm, increased time, and cost) and indwelling catheter benefits (reduced incontinence, simplifying life, and improved independence). The final stage of normalization was accepting both good days (when bladder management fades into the background) and bad days (when bladder management leads to stigma, shame, and complications).

Conclusions: Directly addressing a SCI patient's psychosocial issues related to bladder management may improve compliance rates with the safest bladder management behaviours. Several factors are easily modifiable with medical treatment, education, and simple changes to catheter design.

MP–9.13

Mesenchymal stem cells inhibit hypoxia–induced inflammatory and fibrotic pathways in bladder smooth muscle cells

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Introduction: Partial bladder outlet obstruction (pBOO) results in significant morbidity across childhood and in men with benign prostatic hyperplasia (BPH). In children with severe disorders, such as spina bifida and posterior urethral valves, it can result in a lifetime risk of renal failure. Bladder deterioration is fundamentally driven by hypoxia, whereby the constant contraction of bladder smooth muscles and elevation of intravesical pressure results in the compression of capillaries and decreased blood flow to the bladder wall. We have characterized hypoxia's role as a single stressor and found that hypoxia is sufficient to induce an intense inflammatory and profibrotic switch in bladder smooth muscle cells (bSMCs). Current clinical management is cumbersome and carries significant risk of morbidity. Mesenchymal stem cell (MSC) therapy is known to have a huge potential in the treatment of hypoxic, inflammatory, and fibrotic conditions. We aimed to investigate if these hypoxia–signaling pathways

can be mitigated using stem cells, as well as elucidate the molecular mechanisms of interplay.
Methods: bSMCs were cultured in 3% oxygen tension for 72 hours with either the direct or indirect co–culture with bone marrow–derived MSCs. High pore density transwells were used for indirect co–cultures. Total RNA was extracted for gene expression analysis and the Mesoscale multiplex assay was used for secreted cytokines and growth factor measurements. Total collagen contents were determined using the Sirius Red collagen assay.
Results: Hypoxia increased expression of HIF3α, VEGF, TGFβ1, TNFα, IL–1β, IL–6, αSMA, and total collagen expression and decreased IL–10 levels in bSMCs. Both direct and indirect MSCs co–cultures inhibited >50% of hypoxia–induced TGFβ1 and IL–6 expression ($p<0.005$) in a HIF–independent manner. Also, both MSCs co–culture techniques induced >200% increase in IL–10 protein ($p<0.005$) and inhibited hypoxia–induced αSMA, collagen I and III transcripts, as well as total collagen proteins ($p<0.0001$). Contrastingly, the hypoxia–induced IL–1β and TNFα were inhibited by only the direct co–cultures ($p<0.05$).
Conclusions: MSCs co–culture with bSMCs potently mitigates hypoxia–induced inflammatory and profibrotic pathways. This work has elucidated the role of cell–cell contact and paracrine immunomodulatory mechanisms of MSCs action and opened avenues for therapeutic intervention.

UP–9.1

Maintenance surveillance of high spinal cord lesion (T4/5) patients: A survey of chief urology residents

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Introduction: The urologist's role in the management of patients with spinal cord injury (SCI) is to prevent upper tract damage and, currently, minimal data focuses on surveillance practices for this patient population. The purpose of this study was to determine the preferred maintenance surveillance practices of high SCI patients (T4/5) from the perspective of chief urology residents.
Methods: A 14–question survey was administered at the QUEST chief resident preparation examination in 2017. Topics included: imaging modality, laboratory testing, and procedures related to upper and lower tract surveillance. Data was de–identified and participation was voluntary.
Results: All candidates completed a single questionnaire. Chief residents encountered high SCI patients in either diverse clinical settings, including rehabilitation centres, or single practitioner clinics, or solely as hospital inpatients. Candidates had similar surveillance management algorithms for stable patients with neurogenic voiding dysfunction of: yearly followup with a serum creatinine and upper urinary tract ultrasound. The performance of surveillance cystoscopy in stable patients with neurogenic voiding dysfunction and long–term, indwelling catheter had varied responses. The final question asked how comfortable residents were with managing high SCI patients; 42% responded they were comfortable, while the rest responded that they were either neutral, uncomfortable, or very uncomfortable.
Conclusions: Most chief residents made similar surveillance decisions for high SCI patients, however, they differed on the frequency of cystoscopy and how comfortable they were managing this patient population. Comfortable or not, the decisions chief residents made regarding surveillance were performed in the acute care setting and not in the outpatient setting. In the era of competency–based medical education, this information can be used to highlight training opportunities and improvements for this patient population .

UP–9.2

Changes in patient–important outcomes among patients who received sacral neuromodulation for fecal incontinence

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Introduction: This study assessed pre–/post–changes in patient–important outcomes in patients who underwent sacral neuromodulation (SNM) for fecal incontinence (FI).
Methods: FI can dramatically reduce the quality of life in patients who experience this condition. SNM is a standard therapeutic option for the management of FI syndromes. There is a gap in our knowledge on how SNM affects patient quality of life among patients who experience FI. An administrative database managed by the principal investigator identified patients who underwent SNM for FI. The primary outcome was changed in the Cleveland Clinic Incontinence Score (CCIS), FI Severity Index (FISI), FI Quality of Life (FIQoL), Irritable Bowel Severity (IBS) Score, and Patient Assessment of Constipation–symptoms score (PACS– SYM) three months post–procedure. Mean values were assessed with 95% confidence intervals (CI). Statistical analysis was conducted with a two–sided paired t–test with an alpha level of 0.05.
Results: Sixty–two patients (58 women and four men) received SNM for FI. The mean age is 57.9 (± 3.25) years. Mean difference values for outcomes were reported for the CCIS (–11 [± 3]), FIQoL (–30 [±10]), FISI (–15 [±4]), IBS Score (–11 [±3]), and PAC–SYM (–8 [±3]). A two–sided paired t–test showed statistically significant p values for CCIS ($p=0.00001$), FISI ($p=0.00001$), IBS ($p=0.00001$), and PAC–SYM ($p=0.00001$).
Conclusions: SNM is effective at improving patient quality of life by reducing symptom severity and frequency. Further research is needed to assess demographic characteristics associated with improved quality of life outcomes post–SNM among patients who experience FI.

Poster Session 10: Other Oncology II
June 26, 2018; 0800–0930

MP–10.1
Educational needs of Canadian physicians in the management of advanced prostate cancer

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Introduction: The treatment landscape in metastatic castration–resistant prostate cancer (mCRPC) is rapidly evolving, and as a result the role of physicians is also changing. Many urologists and radiation oncologists are now managing patients with mCRPC, a role traditionally served by medical oncologists. Physician education is critical, given the increase of treatment options, earlier indications for therapy, and sequencing possibilities. This study aims to investigate which educational topics are most critical to Canadian physicians treating mCRPC.
Methods: A 59–item questionnaire was developed by a multidisciplinary steering committee to measure aspects of mCRPC management, including educational needs and preferred learning formats. The survey was delivered to 93 physicians (urologists, radiation oncologists, medical oncologists) actively involved in the treatment of mCRPC.
Results: The survey responses were received from April 17 to May 17, 2017, with a response rate of 53% (49 respondents). Most physicians were urologists/urologic oncologists (55%), followed by medical oncologists (33%) and radiation oncologists (10%). Physicians identified their most important treatment goals for mCRPC patients to be improved quality of life (90%) and overall survival (78%). The top two educational topics selected were sequencing strategies (71%) and individualization of therapy (65%). The preferred format was expert round tables or live lectures, with fewer preferring web–based platforms or live case–based presentations.
Conclusions: The recent increase in novel treatment options for mCRPC has resulted in both opportunities and challenges in management. This treatment landscape is reflected in the results of the survey, which showed the highest preference for education in sequencing strategies and individualization of therapy. Despite the trend of physician education moving to a more digital platform, physicians still value face–to–face methods for learning.

MP–10.2
Magnetic resonance imaging–guided transurethral ultrasound ablation in patients with localized prostate cancer: Three–year outcomes of a prospective, phase 1 study

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Study Groups: Profound Medical Inc.
Introduction: Magnetic reonance imaging (MRI)–guided transurethral ultrasound ablation (TULSA) is a new technology for prostate tissue ablation. It emits directional ultrasound to ablate a volume shaped to patient–specific anatomy using active MRI thermometry feedback control. We present a 36–month followup on a multicentre, prospective, phase 1 study of TULSA in patients with localized prostate cancer (PCa).
Methods: Thirty patients with biopsy–proven PCa (T1c–T2a, prostate–specifc antigen [PSA] ≤10 ng/ml, Gleason Score 3+3, ≤3+4 in Canada only) were treated. TULSA was delivered with 3 mm safety margins. Primary endpoints were safety and feasibility. Secondary endpoints were biochemical, histological, and quality of life changes.
Results: Median age was 69 years (interquartile range [IQR]) 67–71) and PSA 5.8 ng/ml (IQR 3.8–8.0), with 80% low– and 20% intermediate–risk PCa. TULSA time was 36 minutes (IQR 24–44) and prostate volume (PV) 44 cc (IQR 38–48). Spatial control of ablation was ±1.3 mm. Adverse events included urinary tract infections (UTIs) (10 patients), acute retention (eight), and epididymitis (one), with no rectal injuries or fistulae. Pre–TULSA International Prostate Symptom Score (IPSS) of 8 (5–13) and International Index of Erectile Function (IIEF) of 13 (6–28) returned to 6 (4–10) at 3 months and 13 (5–25) at 12 months, and 7 (4–11) and 8 (2–23) at 36 months, respectively. Median PSA decreased 87% at one month with nadir of 0.5 ng/ml (0.2–0.8), stabilized to 0.8 ng/ml (0.4–1.6) at 36 months (n=22). MRI at 12 months shows 88% (83–95%) PV reduction. Twelve–month biopsy showed disease in 55% of patients, clinically significant in 31% of patients. Five patients underwent salvage prostatectomy, one patients salvage radiotherapy, and one pt MRI–guided laser ablation. At 36 months, 1/13 patients with negative 12–month biopsy had 3+3 disease; 1/9 remaining patients with positive 12–month biopsy upstaged to 3+4, and 4/9 downstaged with 3+3 or negative biopsy.
Conclusions: Three–year followup MRI–guided TULSA appears to provide precise, minimally invasive near whole–gland ablation for patients with localized PCa with low morbidity and without precluding salvage therapy. A 110–patient, multicentre trial evaluating efficacy of more complete whole–gland ablation is underway.

MP–10.3
Use of a molecularly enhanced grading system in T1 bladder cancer: A decision analysis

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Introduction: Accurate grading is crucial in T1 bladder cancer (BC) since it is the most important prognostic factor for progression to muscle–invasive BC (MIBC). The 1973 WHO grading system suffered from significant interobserver variability (IV), but was able to stratify T1 BC patients into Grade 2 and 3. Its successor, the currently used 2004 WHO grading system, uniformly assigns high–grade to all T1 BC patients and is, therefore, free of IV, but also valuable prognostic information. Molecularly enhanced grading systems (MEGS) may be able to stratify T1 BC into two subgroups in accordance with the 1973 WHO grading system while being virtually free of IV.
Methods: We constructed a Markov microsimulation with individual–level sampling from distributions to compare the quality–adjusted survival among

patients undergoing primary resection of T1 BC, in which either a perfect MEGS or the 2004 WHO grading system was used for primary grading assessment. Transition probabilities and utilities were derived from literature search and expert consensus.
Results: Use of a MEGS at the primary resection of T1 BC, compared to the use of the 2004 WHO grading system, was associated with 0.3 more quality–adjusted life years (discounted 1.5%: 13.1 vs. 12.8, undiscounted: 15.5 vs. 15.2). Our model showed extremal validity when compared to a large, population–based study. The benefit is more pronounced in younger patients and in patients who suffer more from the decrease in quality of life associated with the post–cystectomy state. Assuming a willingness to pay of $50 000 per incremental quality–adjusted life year, a MEGS test should not cost more than $15 000 per patient to be cost–effective.
Conclusions: The use of a perfect MEGS compared to the use of the 2004 WHO grading system is beneficial in patients undergoing primary resection of T1 BC. The effectiveness of MEGS has to be evaluated in light of costs as soon as these systems reach clinical maturity.

MP–10.4
Ureteroenteric strictures: Long–term outcomes at a single institution

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Introduction: Ureteroenteric stricture (UES) following urinary diversion (UD) is a dreaded complication. Open reimplantation has remained the gold standard treatment.[1] We set out to evaluate long–term outcomes in a heterogeneous group of patients who underwent reimplantation for UES.
Methods: Patients were retrospectively captured from a single surgeon's experience at a major referral centre in Canada between April 2000 and August 2017. Patients had either a continent or incontinent UD for a variety of diagnoses. Patients diagnosed with a benign UES underwent open reimplantation with the creation of a refluxing anastomosis. We reviewed clinicopathological and outcome variables using statistical measures of variability.
Results: Twenty–four patients and 34 renal units underwent open reimplantation for benign UES. Median followup was 48 months (interquartile range [IQR] 8–92). Seventy–five percent of patients underwent UD for malignancy. Benign diagnoses included exstrophy, spina bifida, neurogenic bladder, and infection. Forty–four percent of malignant patients received radiation. Sixty–seven percent of UD were incontinent and ileal conduit was most common overall. Median time from UD to UES was 20 months (IQR 11.3–129). Forty–two percent of patients had a history of failed endoscopic surgery in the form of balloon dilation in nine patients and endoureterotomy in one. Median time to surgery was 12 months (IQR 5.5–21.5). Five patients had minor iatrogenic enterotomies. There were no major complications. The median postoperative stent dwell time was four weeks (IQR 2–4). Median hospital stay was 8.5 days (IQR 7–10). A total of two renal units developed recurrent UES at a median followup of 91.5 months. Prior to recurrence, these patients suffered from recurrent infections. Both renal units were salvaged with repeat reimplantation.
Conclusions: Open reimplantation is associated with good long–term outcomes and low morbidity in a diverse group of UD patients. Recurrences occurred several years later and were likely related to chronic infection rather than surgical factors.

Reference:

1. Packiam VT, Agrawal VA, Cohen AJ, et al. Lessons from 151 ureteral reimplantations for postcystectomy ureteroenteric strictures: A single–center experience over a decade. *Urol Oncol* 2017;35:112.e19–112. https://doi.org/10.1016/j.urolonc.2016.10.005

MP–10.5
Real–time Intraoperative Surgical Competency (RISC) assessments: Development and validation of a procedure–specific evaluation tool for transurethral resection of bladder tumours

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Introduction: Competency–based training requires valid and reliable assessment tools for educators to evaluate surgical skill.[1] Transurethral resection of bladder tumours (TURBT) is a common surgery performed by trainees at all levels, as well as experienced faculty urologists. We report on the initial validation of a TURBT–specific assessment tool to evaluate intraoperative surgical performance.
Methods: Fifty unedited intraoperative TURBT videos were independently reviewed by three expert surgeons to identify fundamental technical skill domains thought to influence surgical outcomes following TURBT. Consensus was reached through direct discussion. The Real–time Intraoperative Surgical Competency (RISC) assessment tool is composed of 20 Likert scale skill domains (GRS) and a final product quality score (FPS) (Fig. 1; available at *https://cua.guide/*). Assessment of trainee and faculty performance during a series of sequential TURBT cases at two institutions were captured to provide validity evidence for RISC. Each case was blindly evaluated by at least two expert surgeons. Inter–rater reliability and correlations of RISC scores with prior TURBT experience and training level were performed.
Results: A total of 176 TURBT cases were completed by a junior resident (124, 66.3%), senior resident (29, 15.5%), or faculty (23, 12.3%) as the primary surgeon. Among trainee participants, RISC scores improved chronologically during the study period. Inter–rater reliability among the expert evaluators was good for RISC GRS scores (Cronbachs alpha=0.65) and moderate for RISC FPS scores (Cronbachs alpha=0.55). GRS scores correlated significantly with previous TURBT experience (0.2; p=0.038) and training level (0.2; p=0.034), and FPS scores correlated with participant training level (0.21; p=0.032).
Conclusions: Through the application of a contemporary framework, multiple sources of construct validity were established for the RISC assessment of TURBT. Similar methodology can used to apply RISC assessments to other surgeries relevant to urology training.

Reference:

1. Frank JR, Snell LS, Cate OT, et al. Competency–based medical education: Theory to practice. *Med Teach* 2010;32:638–45. https://doi.org/10.3109/0142159X.2010.501190

MP–10.6
Renal cell carcinoma in the Canadian Indigenous population

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Introduction: Diagnosis and treatment of renal cell carcinoma (RCC) in Indigenous Canadians (IC) may be different than non–Indigenous Canadians (NIC). The present study aims to evaluate RCC presentation and treatment in the IC population compared to the NIC population.
Methods: Using the Canadian Kidney Cancer information system, prospective patients from 16 institutions between 2011 and 2017 were

included in this cohort study. Baseline patient, tumour, and treatment characteristics between IC and NIC were compared (Table 1; available at *https://cua.guide/*).
Results: During the study period, 110 of 5031 patients self–identified as Indigenous. These patients were significantly younger at the time of clinical diagnosis (p=0.0002) and had a twofold greater prevalence of family history of RCC (p=0.005). Clinical stage at diagnosis was similar between groups (p=0.98). In total, 11 (10%) and 541 (11%) presented with metastatic disease. IC more commonly had prevalent comorbid conditions that may impact the management of RCC, including higher rates of obesity, hypertension, renal disease, diabetes mellitus, and smoking (p<0.05). IC received significantly fewer renal tumour biopsies and a lower rate of active surveillance (p<0.05). From the time of clinical diagnosis, IC had a longer median time to biopsy and surgery by 2.9 months and 0.5 months, respectively. Surgical, ablative, and systemic treatments were not different between groups. The five–year overall survival (OS) rate was significantly greater in IC compared to NIC (p=0.025). Time to recurrence and progression between groups was comparable.
Conclusions: IC with RCC are diagnosed at an earlier age and at a similar clinical stage to NIC. Despite higher baseline comorbid diseases and longer time to biopsy and surgery, IC experienced similar clinical outcomes to NIC. Although five–year OS was different between groups, this may be confounded by factors that may be clarified with further followup.

MP–10.7
Identifying the spatio–functional origins of drug resistance with rapid tumour xenografts

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Introduction: Treatment of patients with advanced cancers increasingly relies on expensive agents targeting specific molecular or cellular aberrations. Pre–existing and acquired drug resistance typically renders these therapies ineffective, leading to lethal disease. The genome and microenvironment of cancers vary spatially, allowing drug resistance to emerge in any tumour region. To quantify this spatio–functional heterogeneity in response to therapy, we developed an approach based on tumour–implantation into the chorioallantoic membrane of chick embryos (PDXovo).
Methods: Various cores were obtained from the primary tumour and metastases from patients with metastatic renal cell carcinoma at the time of nephrectomy (n=6). Each of these cores (5–6 for the primary tumour and 1–3 for metastases) were subdivided into 3 mm sized fragments and were implanted into the chorioallantoic membrane of chick embryos at Day 9 of embryonic development. Two days later, PDXs were treated topically with vehicle or sunitinib (10 uM final in dimethyl sulfoxide [DMSO]) every day until Day 17 of embryonic development. At endpoint (Day 19), all PDXs were submitted to high–frequency ultrasound imaging to quantitate differences in tumour blood perfusion and tumour volume between treatment groups. After imaging, PDXs were individually submitted to total exome sequencing.
Results: We apply this approach to 1548 tumour regions from six renal cell carcinoma patients, achieving a 93.6% engraftment rate. We quantify the spatial heterogeneity in response of these models to sunitinib, an anti–angiogenic therapy, and predict clinical resistance using ultrasound imaging. Combining functional and somatic genomics of the primary tumour and metastases revealed some mutational features associated with sunitinib resistance both at baseline and after treatment.
Conclusions: This phenotype–based readout was superior to various prognostic scoring criteria systems and point towards PDX–based methods to predict de novo drug resistance in patients with metastatic renal cell carcinoma.

MP–10.8
Comparing laparoscopic cytoreductive nephrectomy to open surgery: A large, multicentre, retrospective analysis

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Introduction: Laparoscopic surgery is known to minimize perioperative morbidity and decrease length of hospital admission, however, its benefit in cytoreductive nephrectomy (CN) continues to be a topic of debate. We performed a large, multicentre, retrospective analysis comparing laparoscopic radical cytoreductive nephrectomy (LCN) to open cytoreductive radical nephrectomy (OCN). The objective of this study is to assess whether LCN minimizes the delay to systemic therapy and offers an overall survival benefit when compared to OCN.
Methods: Data was collected from The Canadian Kidney Cancer Information System, a prospectively maintained database from 14 Canadian centres. Patients who underwent CN from January 1, 2011 to June 1, 2016 were included. Cox proportional hazard model was used to adjust for age, gender, pathological stage, size of largest tumour, grade, and whether patient received neoadjuvent systemic therapy.
Results: Two hundred twenty–four patients met the inclusion criteria, 93 patients underwent laparoscopic surgery, and 131 patients underwent open surgery. One–year survival estimate was 85.5% for the open group and 83.3% for the lap group. No statistical significant in survival difference was found for those who underwent laparoscopic or open cytoreductive nephrectomy (p=0.13).
Conclusions: LCN does not lead to earlier delivery of systemic therapy and shows no benefit in overall survival when compared to OCN.

UP–10.1
Comparing outcomes of second–line axitinib or everolimus in metastatic renal cell carcinoma patients: Results from the Canadian Kidney Cancer information system

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Study Groups: Canadian Kidney Cancer information system (CKCis), Kidney Cancer Research Network of Canada (KCRNC).
Introduction: In Canada, second–line (2L) treatment of metastatic renal cell carcinoma (mRCC) (post–first–line [1L] vascular endothelial growth factor–targeted therapy [VEGF–TT]) includes everolimus (EVE), axitinib (AX), and nivolumab. Prior to July 2017, the pan–Canadian Oncology Drug Review (pCODR) indicated that AX could only be used if intolerance or a contraindication to EVE. This study aimed to determine whether or not AX is at least an equivalent alternative for 2L treatment so that AX could be equally accessible for mRCC patients (pts) across Canada.
Methods: Pt data were collected from the Canadian Kidney Cancer information system (CKCis), a prospective database of pts with RCC. Pts who had 1L VEGF–TT (sunitinib or pazopanib), and were subsequently treated with either 2L AX or EVE were analyzed. Time to treatment failure (TTF, time from starting 2L therapy to stopping 2L therapy or loss to followup) and overall survival (OS, time from starting 2L therapy to death or loss to followup) were calculated (Kaplan Meier method).
Results: A total of 1168 pts were treated with 1L VEGF–TT. The study cohort who received either 2L AX or EVE was 337 patients; 108 AX and 229 EVE. Baseline characteristics will be presented. The median TTF was greater for AX than EVE (5.45 m vs 3.78 m; p=0.034). There was no significant difference in median OS between AX and EVE (10.91 m vs. 14.29 m; p=0.158). More pts received further therapy in the EVE group than the AX group (45% vs 33%; p=0.031).
Conclusions: AX had a statistically better TTF than EVE in the 2L setting post–1L VEGF–TT. Given this data, 2L AX should be considered an option for all pts in Canada post–1L VEGF–TT. Although the EVE group had a better OS, this was not statistically significant and may be due to the EVE group receiving more subsequent lines of therapy. A request for advice was submitted to pCODR from the Provincial Advisory Group with this data and resulted in a revised recommendation for equal access to both 2L AX and EVE as of July 2017.

UP–10.2

Evaluation of nuclear factor–kappa B p65 on the Canadian Prostate Cancer Biomarker Network tissue–microarray series reveals its usefulness for biomarkers validation

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Introduction: The Canadian Prostate Cancer Biomarker Network (CPCBN) assembled a multi–institutional tissue–microarray (TMA) resource composed of 1512 patients treated by radical prostatectomy. Biomarkers are evaluated on a test series and promising results allowed access to the validation TMA series. This richly annotated resource is available to researchers who wish to access a large cohort to validate prognostic biomarkers.[1] Over the last decade, nuclear factor–kappa B (NF–kB) p65 showed a reproducible association of its nuclear localization and a patient's risk of biochemical recurrence across several independent cohorts.[2,3] Here, we evaluated the CPCBN TMA–series for p65 expression.
Methods: Automated immunohistochemistry staining of p65 was performed on the test and validation series and two independent observers scored the frequency of p65 nuclear localization. TMA series contain a minimum of three cores of tumour tissues. Statistical analyses were performed using SPSS software.
Results: We demonstrated an association between a high nuclear frequency of NF–kB p65 (cutoff 3%) and increase risk of biochemical relapse, bone metastasis, and prostate cancer–specific mortality in validation series. In multivariate analyses on the validation cohort, p65 remained independent from clinical parameters.
Conclusions: Our study recapitulates the previous observation linking NF–kB p65 with disease progression using a large cohort of Canadian men and underscores the suitability of CPCBN TMAs for biomarker validation. It also highlights its role as a predictor of bone metastasis and prostate cancer–specific survival.
References:

1. The Terry Fox Institute. Canadian Prostate Cancer Biomarker Network. Available at http://www.tfri.ca/en/research/translational–research/cpcbn.aspx. Accessed March 30, 2 018.
2. Gannon PO, Lessard L, Stevens LM, et al. Large–scale independent validation of the nuclear factor–kappa B p65 prognostic biomarker in prostate cancer. *Eur J Cancer* 2013;49:2441–8. https://doi.org/10.1016/j.ejca.2013.02.026
3. Labouba I, Le Page C, Communal L, et al. Potential cross–talk between alternative and classical NF–κB pathways in prostate cancer tissues as measured by a multi–staining immunofluorescence co–localization assay. *PLoS One* 2015;10:e0131024. https://doi.org/10.1371/journal.pone.0131024

UP–10.3

Outcome of 1006 prostate cancer patients with prostate–specific antigen of 50 ug/L or more

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Introduction: There is limited information in the literature on outcome of prostate cancer patients with prostate–specific antigen (PSA) of 50 ug/L or more. These patients were traditionally treated with androgen–deprivation therapy (ADT) alone. Herein, we report the largest series in the world.
Methods: Staging investigations include nuclear medicine bone scan and computerized tomography scan. Since 2004, our multidisciplinary team adopted the American National Comprehensive Cancer Network and Canadian guidelines, modern radiotherapy (RT) techniques such as volumetric modulated arc therapy, dose–escalation, and increasing use of RT.
Results: From 1990–2016, a total of 1006 patients were found (464 with and 542 without clinical metastases). The median followup was 41.6 months (range 1 day–200.4 months). Among the 464 metastatic patients, the median overall survival (OS) was 27.6 months (range1 day–157.9 months), with 86/464 (18.5%) alive at five years and 10/464 (2.1%) alive at 10 years. Palliative treatments include: ADT alone (426 cases), none (28 cases), RT (3 cases), RT+ADT+chemo (three cases), RT+ADT (two cases), and ADT+chemotherapy (two cases). In comparison, the median OS of the 542 non–metastatic patients was 55.9 months (range 23 days–200.4 months). Their treatments include: ADT alone (305 cases), radical RT (136 cases), watchful waiting (81 cases), radical RT+ADT (12 cases), radical prostatectomy (seven cases, all with PSA of 50–60 ug/L), and radical RT+taxotere (one case).
Conclusions: We challenge the previous commonly held belief that non–metastatic patients with very high PSA level should be treated with ADT only. Even for clinical metastatic disease, 18.5% patients were still alive at five years.

UP–10.4

Novel ex–vivo patient–derived 3D model as a powerful tool to apply precision medicine

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Study Groups: Molecular Pathology Platform at CRCHUM.

Introduction: Several therapeutic options are available to treat prostate cancer (PCa). However, choosing the suitable option for individual patients remains a clinical challenge. We have developed an ex–vivo patient–derived 3D model, using microfluidic technology, that identifies responders vs. non–responders in the presence of therapeutic agents. We hypothesize that our ex–vivo model is an effective tool for implementing a precision medicine approach.

Methods: Tumour specimens were sectioned to form microdissected tissue (MDT) samples (~400 µm in diameter) and cultured in a microfluidic chip platform, capable of trapping 32 MDTs in four separate channels. MDTs derived from PCa cell line xenografts (DU145 and LnCaP) were exposed to chemotherapeutics (docetaxel,10nM) for 12 hours and further analyzed after a 12–hour recovery period. Separately, MDTs were also treated with TNF–α (10 ng/mL) for 30 minutes. Cell fate was measured using FACs (Annexin V for apoptotic cells and DRAQ7 for dead cells) or by a technique based on formalin fixed paraffin embedding of MDTs within microfluidic device creating a high–density MDT–array (MDTA). The MDTA slides suitable for histopathology (HP) monitor MDT viability (cleaved caspase–3), proliferation (Ki–67), and epithelial components (CK 8/18).

Results: We observed a viability of >85% by FACs and proliferative capacity of 60% by HP analysis in the MDTs during a culture period of 15 days (n=3 for LNCaP, n=2 for DU145). Response to docetaxel showed 50% increase in caspase–3 activation by HP and 20% increase in cell death by FACs compared to control. We also show a nuclear translocation of p65 in 80% of MDTs treated with TNF–α.

Conclusions: Our ex–vivo drug response model allows us to obtain treatment response analysis in less than five days, appropriate for clinical decision–making, Using our model and the precise techniques developed, we can characterize the molecular response of cancer cells in the presence of therapeutics, while conserving the natural tumour microenvironment.

UP–10.5

The association between physician trust and prostate–specific antigen screening: Implications for shared decision–making

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Introduction: Shared decision–making is widely recommended when men are considering prostate cancer screening with prostate–specific antigen (PSA). The role of a patient's trust in cancer information from their physician in such decisions is unknown.

Methods: We identified male respondents ≥18 years of age from the Health Information National Trends Survey, a population–based survey of people living in the U.S. (2011–2014). We assessed the association between degree of trust in cancer information from respondent's physician with patient–reported receipt of PSA screening and patient–reported discussion of PSA screening with their physician. A multivariable logistic regression model assessed the association between cancer information from patient's physician and cancer information form the internet with PSA–screening, adjusted for a priori covariates.

Results: Among 5069 eligible respondents, 3606 (71.1%) men reported trusting cancer information from their physician 'a lot,' 1186 (23.4%) 'somewhat,' 219 (4.3%) 'a little,' and 58 (1.1%) 'not at all.' A total of 2655 (52.4%) men reported receiving PSA screening. The degree of trust an individual had in their physician for cancer information was strongly associated with their likelihood of having received PSA screening (p_{trend}<0.0001) (54.9% 'a lot' vs. 27.6% 'not at all'). These findings persisted after multivariable regression. Similarly, men who had high levels of trust in their physician were more likely to have discussed PSA screening with a strong trend across strata (p_{trend}<0.0001).

Conclusions: The level of trust an individual has in cancer information from their physician is strongly associated with their likelihood of discussing and undergoing PSA screening. As rationale implementation of PSA screening requires shared decision–making, the level of trust an individual has in their physician has important implications for dissemination of PSA screening guidelines.

UP–10.6

Comparison of perioperative and oncological outcomes in intermediate–risk (ISUP grade 3) vs. high–risk (ISUP grade 4/5) prostate cancer following robot–assisted radical prostatectomy

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Introduction: We aimed to compare perioperative and oncological outcomes in International Society for Urological Pathology (ISUP) grade 3 (Gleason 4+3) vs. ISUP grade 4/5 cancer patients who underwent robotic–assisted radical prostatectomy (RARP).

Methods: A retrospective review of a prospectively maintained IRB–approved database of patients who underwent RARP between January 2007 and April 2017 was performed. Risk stratification was made according to the ISUP Consensus on Gleason Grading of Prostatic Carcinoma. Preoperative characteristics, as well as perioperative, pathological, and oncological outcomes at 24 months, were assessed. Kaplan–Meier method was used to compare biochemical recurrence (BCR)–free survival.

Results: A total of 156 intermediate–risk (ISUP 3) and 110 high–risk (ISUP 4/5) prostate cancer (PCa) patients were identified; 61% of the ISUP 3 group had pT3 compared to 48% of the ISUP 4/5 group. Median positive cores were four in both groups and positive surgical margins rates were 42% in ISUP 3 vs. 35% in ISUP 4/5 patients (p>0.05). Claven–Dindo complications were comparable between groups. BCR–free survival rates at 24 months were 71% (n=121) and 61%(n=67) in ISUP 3 and ISUP 4/5 groups, respectively (p<0.002) (Table 1; available at *https://cua.guide/*). Kaplan–Meier analysis showed higher BCR–free survival rates at 24 months in the ISUP 3 group compared to their counterpart (p log–rank=0.003). Salvage radiotherapy was administered in 27% of ISUP 3 patients compared to 32% of ISUP 4/5 patients (p<0.05). Salvage hormonotherapy was higher in the ISUP 4/5 than in the ISUP 3 group, but this difference was not statistically significant (15% vs. 9%). Rates of patients who received radiotherapy and hormonotherapy were similar in the studies groups (Fig. 1; available at *https://cua.guide/*).

Conclusions: While BCR–free survival benefits were observed at 24 months favouring ISUP grade 3, RARP still offers potential cure and favourable outcomes for men with ISUP grade 4/5. Nevertheless, the consideration of multimodal therapy should be discussed during patient preoperative counselling.

Poster Session 11: Prostate Cancer II
June 26, 2018 0800–0930

MP–11.1
Disparity in public funding of therapies for metastatic castrate–resistant prostate cancer across Canadian provinces

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Introduction: Treatment using abiraterone acetate, enzalutamide, cabazitaxel, and Radium–223 (Ra–223) improve overall survival (OS) and quality of life for patients with metastatic castrate–resistant prostate cancer (mCRPC). Despite their proven benefits, access to these therapies is not equal across Canada.

Methods: We describe provincial differences in access to approved mCRPC therapies. Data sources include the pan–Canadian Oncology Drug Review database, provincial cancer care resources, and correspondence with pharmaceutical companies.

Results: Both androgen receptor–axis–targeted therapies (ARATs) abiraterone acetate plus prednisone, and enzalutamide are funded by provinces in both pre–and post–chemotherapy setting, however sequential ARAT use is not allowed. 'Sandwich' therapy, where one ARAT is used pre–chemotherapy and a second is used upon progression on chemotherapy is funded in Ontario (ON), Alberta, New Brunswick, Prince Edward Island (PEI), and Newfoundland & Labrador. Ra–223 is funded in ON, Quebec (QC), British Columbia (BC), Saskatchewan, and Manitoba to varying degrees: ON allows Ra–223 either pre– or post–chemo (not both); QC allows Ra–223 post–chemo unless chemo is not tolerated; BC allows Ra–223 if other life–prolonging mCRPC therapies have been received or ineligible. Cabazitaxel is funded in all provinces post–docetaxel, except QC and PEI. Cabazitaxel is not funded as 1st–line treatment for mCPRC or in combination with other agents. In Ontario, cabazitaxel is not funded after progression on an ARAT in the post–chemotherapy setting.

Conclusions: While all provinces have access to docetaxel and ARATs, sandwiching sequential ARATs with docetaxel is funded only in select provinces. Ra–223 and cabazitaxel access is not ubiquitous across Canada. Such inequalities in access to life–prolonging therapies could lead to disparities in survival and quality of life among patients with mCRPC. Further research should quantify inter–provincial variation in outcomes and cost that may result from variable access.

MP–11.2
Novel X–ray–activated photodynamic (radioPDT) theranostic nanoparticles for deep–seated tumours

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Study Groups: CUOG Astellas Research Grant.

Introduction: Modern radiotherapy (RT) can precisely treat prostate cancer, but normal tissue toxicity is a serious concern.[1] Photodynamic therapy (PDT) uses photosensitizers (PS) that, when exposed to light, generate reactive singlet oxygen species to cause remarkable tumour cytotoxicity. The dependence on activating light limits PDT's use in deep–seated cancers.[2] RT has unlimited depth penetrance, making X–ray–activated PDT (radioPDT) advantageous in treating deep–seated tumours. This is done with scintillating nanoparticles (NSC) to convert X–rays to light for PDT.[3] Prostate tumours can be hypoxic, and hypoxia's effect on radioPDT is unknown. This is important since both RT and PDT are oxygen–dependent.[4–6] Hence, we investigate radioPDT in hypoxia in terms of singlet oxygen yield and cancer cell death. Secondarily, we investigate our nanoparticle (NP) for diagnostic potential with imaging modalities.

Methods: We developed a novel radioPDT NP by encapsulating NSCs (lanthanum fluoride) and PS (protoporphyrin) into nanocarriers (PEG–PLGA) (Fig. 1; available at *https://cua.guide/*). Therapeutic potential was evaluated via singlet oxygen yield and cell viability assay in normoxic and hypoxic conditions under radiation and light PDT. Diagnostic properties were evaluated via computed tomography (CT) and magnetic resonance imaging (MRI), as well as X–ray imaging of in vivo distribution characteristics using a chorioallantoic membrane (CAM) chick embryo model.

Results: Preliminary data shows radioPDT significantly augments RT in hypoxia via singlet oxygen production (Fig. 2; available at *https://cua.guide/*). In vitro assays show virtually no toxicity in prostate cancer and fibroblast cell lines when not activated (Figs. 1g–I; available at *https://cua.guide/*), and significant increased cell–killing by up to 50% ($p<0.001$) when activated over RT alone (Figs. 2a–d; available at *https://cua.guide/*). CT and MRI studies show appreciable signal generation, and CAM studies show preferential tumour–targeting (Fig. 3; available at *https://cua.guide/*).

Conclusions: RadioPDT is a novel method of augmenting RT and minimizing toxicity. Future studies are planned to explore its potential in vivo.

References:
1. Do NL, Nagle D, Poylin VY. Radiation proctitis: Current strategies in management. *Gastroenterol Res Pract* 2011;2011:917941.
2. Moore CM, Pendse D, Emberton M. Photodynamic therapy for prostate cancer — a review of current status and future promise. *Nat Clin Pract Urol* 2009;6:18–30. https://doi.org/10.1038/ncpuro1274
3. Zou X, Yao M, Ma L, et al. X–ray–induced nanoparticle–based photodynamic therapy of cancer. *Nanomedicine* 2014;9:2339–51. https://doi.org/10.2217/nnm.13.198
4. Grimes DR, Partridge M. A mechanistic investigation of the oxygen fixation hypothesis and oxygen enhancement ratio. *Biomed Phys Eng Express* 2015;1:045209. https://doi.org/10.1088/2057–1976/1/4/045209

5. Moore RB, Xiao Z, Tulip J, et al. A comparison of susceptibility to photodynamic treatment between endothelial and tumour cells in vitro and in vivo. *Photodiagnosis Photodyn Ther* 2007;4:160–9. https://doi.org/10.1016/j.pdpdt.2006.12.003
6. Milosevic M, Warde P, Menard C, et al. Tumour hypoxia predicts biochemical failure following radiotherapy for clinically localized prostate cancer. *Clin Cancer Res* 2012;18:2108–14. https://doi.org/10.1158/1078–0432.CCR–11–2711

MP–11.3

Triple–positive microparticles as a "liquid biopsy" for risk stratification of prostate cancer

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Introduction: Prostate cancer (PCa) releases submicron fragments in serum known as prostate cancer microparticles (PCMPs).[1]Our lab has previously demonstrated that enumeration of PCMPs harbouring prostate–specific membrane antigen (PSMA) accurately identifies patients diagnosed with high–risk PCa.[2] The objective of this pilot study is to identify PCMP subpopulations that differentiate low–risk patients from intermediate– or high risk–patients.

Methods: We conducted a blinded retrospective study of PCMPs isolated from plasma of 60 patients undergoing radical prostatectomy for low–risk (Gleason score [GS] 6), intermediate–risk (GS 7), and high–risk (GS ≥8) PCa. PCMPs were identified using pre–optimized fluorophore–conjugated monoclonal antibodies and nanoscale flow cytometry.[3] Triple–positive PCMPs were identified using combination of two prostate–specific markers (PSMA[4], STEAP1[5]) and one PCa marker (GHSR1a[6] or CD151[7]). GS 6 was compared to GS 3+4, 4+3, and ≥8 using pathology results from radical prostatectomy. Plasma samples collected prior to surgery were obtained from the Genitourinary Biobank at Princess Margaret Hospital (Toronto). Statistical analysis and area under curve (AUC) was calculated using GraphPad Prism 7.0.

Results: PSMA+STEAP1+CD151 PCMPs showed a statistically significant difference in recorded events between GS 6 from 3+4, 4+3, and ≥8 ($p<0.01$) (Fig. 1; available at *https://cua.guide/*) with AUC of 0.76, 0.79, and 0.82, respectively (Figs. 2–4); PSMA+STEAP1+GHSR1a PCMPs showed a statistically significant difference in recorded events between GS 6 from 3+4 and ≥8 ($p<0.05$) (Figu. 1) with AUC of 0.89, 0.69, and 0.85, respectively (Figs. 2–4).

Conclusions: This pilot study has shown that PSMA+STEAP1+GHSR1a triple–positive PCMPs can better differentiate low–risk from intermediate– and high–risk PCa patients. With further evaluation using a validation cohort, we believe PCMPs have the potential of becoming a "liquid biopsy" that can assist in risk stratification prior to obtaining traditional transrectal prostatic biopsies.

References:

1. Tavoosidana G, Ronquist G, Darmanis S, et al. Multiple recognition assay reveals prostasomes as promising plasma biomarkers for prostate cancer. *Proc Natl Acad Sci USA* 2011;108:8809–14. https://doi.org/10.1073/pnas.1019330108
2. Biggs C, Siddiqui K, Al–Zahrani A, et al. Prostate extracellular vesicles in patient plasma as a liquid biopsy platform for prostate cancer using nanoscale flow cytometry. *Oncotarget* 2016;7:8839–49. https://doi.org/10.18632/oncotarget.6983
3. Apogee Flow systems. Micro Flow Cytometer. Retrieved in February, 2017, from http://www.apogeeflow.com/micro–flow–cytometer.php.
4. Silver D, Pellicer I, Fair W, et al. Prostate–specific membrane antigen expression in normal and malignant human tissues. *Clin Cancer Res* 1997;3:81–5.
5. Challita–Eid P, Morrison K, Etessami S, et al. Monoclonal antibodies to six–transmembrane epithelial antigen of the prostate–1 inhibit intercellular communication in vitro and growth of human tumour xenografts in vivo. *Cancer Res* 2007;67:5798–805. https://doi.org/10.1158/0008–5472.CAN–06–3849
6. Jeffery P, Herington A, Chopin L. Expression and action of the growth hormone releasing peptide ghrelin and its receptor in prostate cancer cell lines. *J Endocrinol* 2002;172:R7–11. https://doi.org/10.1677/joe.0.172R007
7. Detchokul S, Newell B, Williams E, et al. CD151 is associated with prostate cancer cell invasion and lymphangiogenesis in vivo. *Oncology Reports* 2014;31:241–7. https://doi.org/10.3892/or.2013.2823

MP–11.4

Favourable preservation of erectile function after brachytherapy for localized prostate cancer

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Introduction: Prostate brachytherapy (PB) with radioactive seeds has been shown to have a favourable outcome in preserving erections in patients with localized prostate cancer (PCa). In this present study, we analyzed the rate of preserved erectile function (EF) and the impact of patient comorbidities on post–PB potency.

Methods: This study included 627 patients who had been assessed for pre– and post–implant EF from 2005–2017. Assessment was based on a standardized physician–reported measure called the Common Terminology Criteria for Adverse Events Scale. Logistic regression analysis was used to assess clinical predictors of preserved EF after PB, defined as having sufficient erections for sexual activity with or without the need of oral pharmacological or mechanical assistance. Covariates included age, diabetes, hypertension, statin use, coronary artery disease, International Prostate Symptom Score (IPSS), prostate volume, and Cancer of the Prostate Risk Assessment (CAPRA) score. All patients with androgen–deprivation therapy or dutasteride use were excluded from analysis to avoid confounding factors.

Results: Post–PB EF was assessed at an average of six months (n=627), at one year (n=538), at two years (n=440), at four years (n=272), and at five years (n=124). At two and five years, post–PB EF was preserved in 87% and 84% of patients, respectively. When adjusting for all available covariates, age, pre–PB EF, and the presence of vascular comorbidities (hypertension, diabetes, and statin use) were all predictors of preserved potency after PB (all $p<0.01$). When performing a sensitivity analysis for vascular comorbidities, the presence of diabetes had the strongest impact on EF than either hypertension or statin use ($p<0.01$).

Conclusions: More than 84% of patients had preserved EF at five years after PB. Age, pre–PB EF, and vascular comorbidities had a statistically significant impact on EF after PB. These factors could be important considerations when counselling patients about post–PB outcomes for localized PCa.

MP–11.5

Validation of the 2015 prostate cancer Gleason grade groups for predicting cancer control outcomes after radical prostatectomy in a universal healthcare system

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Introduction: A five–tier prognostic Gleason grade group (GGG) system was proposed to simplify risk stratification of patients with prostate cancer in which Gleason scores 6, 3+4, 4+3, 8, and >8 are considered GGG 1–5, respectively. We investigated the utility of radical prostatectomy GGG for predicting cancer control outcome after surgery in a universal healthcare system.

Methods: A retrospective analysis of prospectively collected data from our institutional Radical Prostatectomy Database was performed. A total of 1805 consecutive men who underwent radical prostatectomy for clinically

localized prostate cancer between September 2007 and January 2013 were analyzed. All patients followed a common postoperative clinical care pathway. The cancer control outcome was biochemical recurrence (BCR). BCR was defined as a prostate–specific antigen (PSA) ≥0.2 ng/ml, followed by a subsequent confirmatory value or initiation of salvage therapy. Multivariable Cox regression models were used to evaluate the prognostic ability of radical prostatectomy GGG. Statistical tests were two–sided (p≤0.05).

Results: Complete data were evaluable for 1694 out of 1805 patients (94%). The cohort included men with radical prostatectomy (RP) GGG1 (n=531, 31.3%), GGG2 (n=851, 50.2%), GGG3 (=249, 14.7%), GGG4 (n=38, 2.2%), and GGG5 (n=25, 1.5%) prostate cancer. The median follow–up duration was 48 months. The predicted five–year freedom from BCR rates for RP GGG 1–5 were 94.8%, 87.6%, 59.7%, 50.5%, and 43.0%, respectively (Fig. 1; available at *https://cua.guide/*). Higher RP GGG was independently associated with an increased risk of BCR (GGG2 to 3, hazard ratio [HR] 0.036; 95% confidence interval [CI] 0.26–0.49; p<0.0001).

Conclusions: This report represents the first Canadian validation of the 2015 prostate cancer GGG system. The five–tier radical prostatectomy GGG system predicted cancer control outcome after surgery in a universal healthcare system .

MP–11.6

Cost–effectiveness of novel screening methods used for prostate cancer in patients before an initial biopsy or after a negative biopsy

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Study Groups: Prostate Cancer Canada.

Introduction: Transrectal ultrasound–guided biopsies (TRUSGB) are the main approach of diagnosing prostate cancer, but overdiagnosis and sampling errors are major limitations. Magnetic resonance imaging–guided biopsy (MRGB) is an available method that has shown potential in previous studies. The available screening methods we evaluated are 4Kscore, Prostate Health Index (PHI), and Prostarix. In addition, five tests for use after an initial negative biopsy for better patient stratification were assessed.The aim of this study was to perform a cost–effectiveness analysis of these tests as decision tools for an initial biopsy or after a negative biopsy compared to the current clinical practice.

Methods: To perform a cost–effectiveness analysis of these tests, a Markov model we previously developed and published was modified and developed to account for these management disease strategies. In addition, a second model was developed on patients referred to a second biopsy due to a remaining suspicion of prostate cancer after an initial negative biopsy. Quality–adjusted life years gained (QALY) and costs for the tests were estimated over a time horizon of five, 10, 15, and 20 years.

Results: The costs for 4Kscore were $6000, $8300, $10 389, and $11 995 for the different time spans and for PHI $7839, $11164, $14 700, and $17 419, respectively. The cumulative effects for 4Kscore were 4.38, 7.42, 9.42, and 10.59 QALY and for PHI they were 4.33, 7.28, 9.18, and 10.25, respectively. Compared to the TRUSGB and MRGB strategies, the 4Kscore strategy was the dominating strategy. Finally, PCA3 and ConfirmMDx, demonstrated similar costs and QALYs as the standard strategy, TRUSGB, yet higher costs when compared to the MRGB strategy.

Conclusions: The new screening methods show potential in complementing the existing screening process for prostate cancer by improving the costs and QALY compared to TRUSGB and MRGB.

MP–11.7

An educational program reduces prostate cancer patients' side effects bother and improves their confidence in managing androgen–deprivation therapy adverse effects

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Introduction: Androgen–deprivation therapy (ADT) is the primary treatment for systemic prostate cancer, but ADT has various side effects that reduce patients' quality of life. We developed and assessed the effectiveness of an educational program to help patients manage ADT side effects.

Methods: From April 2014 to March 2017, 482 patients and 294 partners attended a one–time, 1.5–hour ADT class at five sites across Canada. Patients received a copy of the book *Androgen Deprivation Therapy: An essential guide for men with prostate cancer and their partners* (DEMOS Health, NY), which covers ADT side effects and evidence–based strategies for managing them. Before attending the ADT class (baseline), 97 patients (68.6±7.8 years old) completed questionnaires on frequency of ADT side effects, how bothered they are by these side effects, and their perceived self–efficacy in managing those side effects. They completed the survey again 2–3 months after the class (followup). At baseline 70% of patients either had not started or been on ADT for <2 months.

Results: At both baseline and followup, patients who had been on ADT for ≥2 months were more bothered by various ADT side effects (e.g., fatigue, risk of bone loss, genital shrinkage, depression, body hair loss) than those on ADT <2 months. However, at followup, patients' self–efficacy for managing ADT side effects (e.g., hot flashes, breast events, weight gain, risks of bone loss, and diabetes) significantly improved, despite experiencing more side effects and more bother from those side effects. Patients who were on ADT <2 months who attended the class were significantly less bothered by hot flashes and body hair loss and reported significantly better self–efficacy in managing hot flashes, risks of bone loss, and diabetes than those who had been on ADT longer before attending the class.

Conclusions: The ADT educational program dampens side effect bother and improves self–efficacy for managing many ADT side effects.

MP–11.8

Comparison of early prostate–specific antigen decline between prostate brachytherapy and different fractionation of external radiotherapy: Impact on biochemical failure

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Introduction: It would be helpful to be able to precipitously identify patients who have favourable prostate–specific antigen (PSA) declines in order to reassure them, and to allow for closer followup of those who have an unfavourable PSA decline. We compared early PSA decline patterns and PSA nadirs between low–dose rate seed prostate brachytherapy (LDR–PB) and different fractionations of external beam radiotherapy (EBRT), and their predictive importance for biochemical failure (bF).

Methods: Included were patients with D'Amico low– or intermediate–risk prostate cancer, who underwent a single modality treatment without androgen–deprivation. Three different treatment groups were compared: a) normo–fractionation EBRT up to 70.2–79.2 Gy/1.8–2.0 Gy; b) LDR–PB; and c) EBRT with hypofractionation 60 Gy/3 Gy daily or 5–7.25 Gy once weekly over 9–15 weeks, to a total dose of 45 Gy–36.25 Gy, respectively. The log–rank test, Cox regression analysis, and non–parametric tests were used.

Results: For the 892 patients, the followup for patients without bF was 84 months (interquartile range [IQR] 60–102). A total of 108 patients

(12%) experienced bF at a median of 59 months after treatment (IQR 35.3–78.0). BF was experienced in 12%, 8%, and 27% of patients treated with hypofractionation, LDR–PB, and normofractionation, respectively. The PSA decline within the first 15 months was generally exponential. There were significant differences between treatment groups when comparing whether the early exponential decline was slow or fast (<median vs. >median): the LDR–PB often showed a faster exponential decline compared to the EBRT treatments. But whether the exponential decline was fast or slow did not have an influence on recurrence. The only factors that predicted for bF both in univariate and multivariate analyses were: achieving a nadir of <0.2 ng/mL and <0.5 ng/mL, as well as taking more than the median of 48 months to obtain the PSA nadir (log–rank test p<0.001). In a separate multivariate analysis adjusted for age, treatment type, and CAPRA score for each PSA nadir and the time to nadir, all three maintained their significant predictive value (p<0.001): PSA nadir <0.5 ng/mL, hazard ratio [HR] 0.19 (95% confidece interval [CI] 0.13–0 .27); PSA nadir <0.2 ng/mL, HR 0.20 (95% CI 0.12–0.32), PSA nadir ≥48 months, HR 0.12 (95% CI 0.08–0.20).
Conclusions: Although there are significant differences in early exponential PSA decline between different treatments, only the PSA nadir and longer time to nadir were predictive factors for bF.

MP–11.9
Is there a therapeutic role for cannabis in advanced prostate cancer? Exploring the patterns and predictors of use among men receiving androgen–deprivation therapy

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Introduction: Prostate cancer patients receiving androgen–deprivation therapy (ADT) often experience a combination of disease symptoms and treatment side effects. The therapeutic use of cannabis to alleviate these side effects has not been studied, despite increasing patient inquiry. We combined a prospective questionnaire with retrospective urine analyses in order to study the use of cannabis among men receiving ADT.
Methods: A total of 222 consenting men undergoing ADT were included in this two–part study. Patient data were extracted from the electronic health record. In part one, a questionnaire was administered to 56 men, probing the demographics, usage habits, perspectives, and degrees of symptom relief related to cannabis use. In part two, 166 frozen urine samples were analyzed using an immunoassay that detected the presence of THC metabolites. The respondents were then stratified into two groups, users vs. non–users, and analyses were conducted.
Results: Questionnaire data revealed that 23.2% of men had recently used cannabis. In contrast, 5.7% of men had THC metabolites in their urine. Combined questionnaire and urine data revealed that users were significantly younger (p<0.003) and had lower testosterone levels (p<0.004) than non–users. The most popular method of cannabis consumption was oils (62%). The most common reasons for cannabis use were pain (46%), low energy (46%), and hot flushes (23%). The majority of men experiencing these symptoms reported some degree of relief after cannabis use.
Conclusions: Cannabis use among men with advanced prostate cancer receiving ADT is more prevalent than in the general population and other oncological cohorts. The reported therapeutic benefit among users warrants confirmation and further study in well–conducted clinical trials. The discrepancy in the prevalence of cannabis use between questionnaire and urine data reflects assay specificity for THC, which is not a component of many prescription and non–recreational products.

MP–11.10
Robotic vs. open prostatectomy: A real–world, single–centre Canadian experience

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Introduction: Data from a randomized trial suggest transfusion rates are similar for robotic and open prostatectomy. There is ongoing debate regarding the benefits of robotic vs. open prostatectomy in Canada. The objective of this study was to compare real–world perioperative outcomes of robotic and open prostatectomy at a large Canadian academic centre.
Methods: A retrospective review of all prostatectomies performed at The Ottawa Hospital between 2009 and 2016 was completed using an administrative data warehouse. Extracted data included patient factors (age, body mass index, Association of Anesthesiologists [ASA] score), operative factors (length of operation, surgical approach, anesthesia type) and perioperative patient and health services outcomes (length of post–anesthetic care unit [PACU] stay, pain score, length of hospital stay, transfusion rate, readmission or return to the emergency room within 30 days, and hospital cost). The primary outcome was rate of transfusion during the index admission. Univariate and multivariate analyses were performed to identify factors associated with transfusion.
Results: A total of 1639 prostatectomies were performed by 12 surgeons during the study period (689 robotic, 770 open). The rate of transfusion was significantly less for robotic surgery (0.7% vs. 11.3%; p<0.001). The robotic prostatectomy cohort had fewer regional anesthetics (0.3% vs. 59.9%; p<0.001), shorter length of PACU stay (156.1 minutes vs. 232.5 minutes; p<0.001), and shorter length of hospital admission (1.4 days vs. 2.8 days; p<0.001). Hospital costs were $1000 more per case for robotic prostatectomy ($11 391.24 vs. $10 429.68; p<0.001).
Conclusions: This hospitalwide analysis revealed that robotic prostatectomy is associated with a significantly lower transfusion rate compared to the open approach. Further studies including pragmatic real–world data are needed to determine the true impact of robotic technology on prostate surgery.

MP–11.11
18F–fluorocholine positron emission tomography–computed tomography (18F–FCH PET/CT) for staging of high–risk prostate cancer patients

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Introduction: Given the inherent risk of extraprostatic disease in high–risk prostate cancer, accurate detection of nodal or skeletal disease involvement is crucial. Our study aims to evaluate the diagnostic performance of 18F–Fluorocholine position emission tomography–computed tomography (18F–FCH PET/CT) for detection of extraprostatic disease in patients with high–risk prostate cancer at initial staging, to compare 18F–FCH PET/CT to conventional imaging modalities, and to evaluate its clinical impact.
Methods: We performed a single–centre retrospective study on 76 patients who underwent 18F–FCH PET/CT for initial staging of high–risk prostate cancer. Sensitivity, specificity, and positive and negative predictive values were determined for extraprostatic disease. Results were compared to magnetic resonance imaging (MRI), computed tomography (CT), and bone scan (BS) when available.
Results: Twenty–two (29%) scans were positive, 49 (64%) negative, and five (7%) equivocal for extraprostatic disease. Of the positive scans, 17 were positive for regional lymph node involvement, 12 distant nodes, five bone

metastases, and three lung metastases. Overall sensitivity, specificity, and positive and negative predictive values for extraprostatic disease were 62%, 100%, 100%, and 76%, respectively. For nodal involvement, sensitivity, specificity, and positive and negative predictive values were 64%, 100%, 100%, and 80%, respectively, and 86%, 100%, 100%, and 98% for bone and other metastases. Conventional imaging was negative for lesions found on 18F–FCH PET/CT in five patients (28%) when available for comparison; BS was negative in two patients (50%) when available for comparison. 18F–FCH PET/CT changed the clinical management in nine patients (12%).
Conclusions: 18F–FCH PET/CT demonstrates moderate sensitivity and high specificity for detection of extraprostatic disease in high–risk prostate cancer at initial staging. PET with novel prostate–specific membrane antigen (PSMA) inhibitors may overcome some of these limitations.

MP–11.12

Omega–3 fatty acids and low–grade prostate cancer progression risk during active surveillance

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Introduction: Prostate cancer (PCa) is the most frequently diagnosed cancer among Canadian men.[1] Fat is an important dietary factor thought to impact PCa development and progression.[2] Pre–clinical and clinical studies showed that intake of high omega–3 (Ω3) fatty acids (FA) has protective effects against PCa, likely via their anti–inflammatory properties.[3,4] Here, we aimed at evaluating the associations between low–grade PCa progression and Ω3 status, which includes dietary intake, as well as Ω3 FA levels in circulation and in the prostatic tissue.
Methods: A total of 189 men diagnosed with low–grade PCa (Gleason score 6) who chose active surveillance were recruited in a phase 2b clinical trial. Eligible men (n=174) underwent a repeat prostate biopsy session 2–14 months after their initial PCa diagnosis. We conducted an observational study at this time point. For all men, FA intake was assessed using the food frequency questionnaire and their levels were measured in red blood cells and in prostate tissue using gaz chromatography. Logistic regression was used to evaluate the associations.
Results: At the first repeat biopsy session, PCa of 51 patients had progressed to a more aggressive form (Gleason score ≥7). We found that high level of long–chain (LC) Ω3 in prostate tissue was associated with a reduced risk of PCa progression (odds ratio [OR] 0.30; 95% confidence interval [CI] 0.10–0.91; p=0.03). Similar results were obtained with dietary LCΩ3 intake (OR 0.31; 95% CI 0.11– 0.86; p=0.02). Also, we observed that a Ω6/Ω3 ratio measured in prostate tissue was positively associated with PCa progression risk (OR 2.91; 95% CI 1.04–8.17; p=0.04).
Conclusions: This study suggests that Ω3 FA, specifically LCΩ3, may be protective against low–risk PCa progression. In addition, results provide a rationale for LCn3–rich dietary intervention in men diagnosed with low–risk PCa, in order to reduce the risk of cancer progression.
References:

1. Fradet Y, Klotz L, Trachtenberg J, et al. The burden of prostate cancer in Canada. *Can Urol Assoc J* 2009;3:S92–100.
2. Gerber M. Omega–3 fatty acids and cancers: A systematic update review of epidemiological studies. *Br J Nutr* 2012;107Suppl2:S228–39. https://doi.org/10.1017/S0007114512001614
3. Demark–Wahnefried W, Polascik TJ, George SL, et al. Flaxseed supplementation (not dietary fat restriction) reduces prostate cancer proliferation rates in men pre–surgery. *Cancer Epidemiol Biomarkers Prev* 2008;17:3577–87. https://doi.org/10.1158/1055–9965.EPI–08–0008
4. Fradet V, Cheng I, Casey G, et al. Dietary omega–3 fatty acids, cyclooxygenase–2 genetic variation, and aggressive prostate cancer risk. *Clin Cancer Res* 2009;15:2559–66. https://doi.org/10.1158/1078–0432.CCR–08–2503

MP–11.13

Comparison of mass spectrometry and chemiluminescence immunoassay methods to measure low testosterone levels reveals high rates of discrepancies

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Introduction: Testosterone (T) levels in castrated prostate cancer men can predict time to castration resistance and T levels are routinely measured in men undergoing androgen–deprivation therapies. Mass spectrometry (MS) is the gold standard method to measure T levels, but a vast majority of hospitals use immunoassay methods because of the lower cost. The objective of this study was to compare the accuracy of immunoassays to measure T at low T levels, taking MS as the reference standard.
Methods: We compared serum T levels measured using both liquid chromatography coupled to tandem mass spectrometry (LC–MS/MS) and chemiluminescent immunoassay (CLIA) in 224 serum samples. The cohort was mainly composed of prostate cancer patients undergoing chemical castration who were followed at CHU de Québec. All dosages took place at the CHU de Québec, which is one of the rare institution to use both methods to evaluate the level of circulating testosterone <3 nM.
Results: Mean testosterone level was 1.13 nM (confidemce interval [CI] 0.43–2.94) for CLIA and 1.18 nM (CI 0.19–3.54) for LC–MS/MS. We observed that 20.7% of the samples with T <0.7 nM measured by CLIA were measured ≥0.7 nM by LC–MS/MS. In these samples, CLIA underestimated T levels by a mean of 42.2% (p<0.0001) over LC–MS/MS. On the other hand, we found that 30.9% of the samples with T ≥0.7 nM measured by CLIA were measured <0.7 nM by LC–MS/MS. In these samples, CLIA overestimated T levels by a mean of 87.1% (p<0.0001) over LC–MS/MS. Repeated T dosages were available for 26 patients for which we could evaluate the intrapatient variation by both methods. No significant difference was observed between CLIA and LC–MS/MS intrapatient variation measurements.
Conclusions: At castrated T levels (<0.7 nM), CLIA method can under– or overestimate T levels when compared to MS. Therefore, when measured by immunoassays, T levels should be repeated and interpreted with caution before changing management.

MP–11.14

Variations in monthly surgical volume of robotic radical prostatectomy: Do restrictions on caseload affect surgeon performance?

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Introduction: Surgical volume of an institution is a known predictor of surgical outcomes in urological procedures. However, the impact of variations in monthly caseload due to factors such as summer cutbacks and budget restrictions, has not been well–studied yet. We sought to assess the impact of monthly caseload on surgical performance and surgical margins, with a consideration for surgeon experience.
Methods: Prospective data from 1034 robot–assisted prostatectomy (RARP) cases performed by two surgeons (KCZ, AE) at two academic centres were analyzed. Cases were subgrouped by surgeons and pStage, and stratified by low, medium, and high monthly volumes of 0–6, 7–10, and >10 monthly cases, respectively. The experience curves of both surgeons were used to assess the impact of monthly volume on positive surgical margins (PSM) at different stages using logistic regression.
Results: A total of 130, 296, and 608 cases were analyzed for low, medium, and high–volume months, respectively. Six hundred twenty cases were performed by Surgeon 1, who did not show any significant improvement in PSM across cases. Our analysis did not reveal any correlation between monthly surgical volume and PSM for Surgeon 1. Through 414 cases, Surgeon 2 had significant improvement in PSM (p<0.001). While no significant correlation between monthly volume and PSM was found in

the second half of Surgeon 2's cases, low surgical volume was associated with a significantly higher likelihood of PSM in pT2 disease compared to high–volume months in the early 200 cases of his RARP experience, despite controlling for patient factors and surgeon experience (odds ratio 7.6; 95% confidence interval 1.5–39.6; p=0.015).
Conclusions: These results highlight the importance of higher caseloads in early surgical experience of RARP to ensure better oncological outcomes and reduce PSM. Moreover, our findings indicate that variations in monthly surgical volume does not appear to affect more experienced surgeons, and does not seem to lead to worse oncological outcomes.

UP–11.1
Deciphering the effects of omega–3 fatty acid supplements on prostate cancer

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Introduction: Inflammation is a contributing factor to prostate cancer (PCa). We previously observed that an omega–3 (Ω3)–rich diet decrease PCa tumour growth by favourably modulating inflammatory response. In this study, we tested the specific effects of purified Ω3 fatty acids (FA) subtypes on tumour growth, inflammatory response, gut microbiota, and tumour gene expression in a murine PCa model.
Methods: C57BL/6 mice were daily fed with purified FA (Ω3–EPA, Ω3–DHA, Ω6–AA, or Ω9–rich high–oleic sunflower oil (HOSO) as control), and injected subcutaneously with TRAMP–C2 mouse PCa cells. FA incorporation was measured using gaz chromatography. Cytokine and gene expression profiles were analyzed in tumours using BioPlex technology and high–throughput RNA sequencing, respectively. Fecal DNA content was profiled using 16S rRNA metagenomic sequencing.
Results: We measured specific FA incorporation into red blood and tumour cells. Only tumours of EPA–fed mice had a reduced tumour growth than control. Many pro–inflammatory cytokines were reduced in Ω3–EPA– and DHA–fed tumours. We found EPA–fed mice had reduced expression of genes related to angiogenesis and inflammation. We confirmed lower expression of VEGFR and VEGF and smaller CD31–stained blood vessels in EPA–fed tumours. Finally, gut microbiota analysis revealed that most bacterial shifts were found in DHA–fed animals. Further analysis predicted increased functions associated to butirosin and neomycin biosynthesis, renal cell carcinoma, and glycerophospholipid metabolism from the gut microbiota of AA–fed animals.
Conclusions: Both Ω3 subtypes modulated intra–tumoural inflammation. Interestingly, DHA was the FA driving the biggest changes in fecal microbiota. However, we found only EPA to significantly reduce PCa tumour growth, potentially achieved by gene expression modulation leading to reduced angiogenesis and inflammation. Together, these results suggest that both Ω3 subtypes modulate inflammation, but possibly via separate mechanisms.

UP–11.2
Effects of omega–3–rich fish oil on inflammation in prostate cancer: Preliminary results of a clinical trial

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Introduction: Prostate cancer (PCa) is the third leading cause of death by cancer in Canada. Long–chain omega–3 (LCn3) poly–unsaturated fatty acid (FA), mainly EPA, is thought to be beneficial against PCa development and progression via anti–inflammatory properties. A randomized, double–blind, phase 2b clinical trial (RCT) is currently ongoing in our research team to investigate the effects of an EPA–rich fish oil supplementation in men with PCa. Here, we aimed to explore the inflammatory status of participants, a secondary outcome of this RCT.
Methods: A total of 130 patients with localized PCa treated by radical prostatectomy (RP) were randomized to either a daily intake of MAG–EPA or placebo six weeks before RP, and for up to one year post–RP. Without lifting the blind, systemic and local inflammation were assessed by measuring expression levels of 27 inflammatory mediators using the Bio–Plex™ technology. Cytokine levels in plasma and prostate tissue were measured at baseline, RP, and 12 months for the first 30 patients who completed the study.
Results: Preliminary analysis revealed important modulation of circulating cytokine levels over time for about half of patients. Interestingly, we observed two distinct plasmatic cytokine profiles at RP (designated Group A and Group B). More than half of circulating cytokines were significantly upregulated in Group A compared to Group B. No significant difference was observed between patients in the prostate tissue at RP.
Conclusions: These first preliminary results suggest that systemic inflammation is modulated by the intervention in PCa patients over time. The analysis of the entire cohort is warranted and will likely identify LCn3–modulated cytokines in circulation and in the prostate tissue. This RCT represents a unique setting to study the LCn3 biological effects on PCa.

UP–11.3
Factors associated with usage of bone–targeted therapies in metastatic castration–resistant prostate cancer.

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Introduction: Bone–targeted therapies (BTT), such as zoledronic acid and denosumab, were covered by the public drug plan in Quebec in 2005 and 2012, respectively, for the prevention of skeletal–related events in patients with metastatic castration–resistant prostate cancer (mCRPC). The study aims to describe and identify factors associated with BTT usage in mCRPC patients in Quebec.
Methods: This was a retrospective cohort consisting of patients treated for mCRPC in two McGill University hospitals from January 2010 to June 2014. Clinical data and treatments were extracted from patient charts. The cohort was divided into two groups according to mCRPC diagnosis year. The cutoff year chosen was 2012, as it corresponded to the public reimbursement of denosumab. The Kaplan–Meier method was used to estimate time to first BTT prescription since mCRPC diagnosis. Cox regression was used to identify predictors of BTT usage.
Results: The cohort consisted of 308 mCRPC patients, of which 162 were diagnosed from 2010–2012 (pre–2012 group) and 146 from 2012–2014 (post–2012 group). In the pre–2012 group, 141 patients (87%) had bone metastases and 80% of them had at least one prescription for a BTT (denosumab [25%], zoledronic acid [66%]). At 12 months from mCRPC

diagnosis, 50% of patients received a BTT prescription in this group. In the post–2012 group, 133 patients (91%) had bone metastases and 84% of them had at least one prescription for a BTT (denosumab [89%], zoledronic acid [8.9%]). Factors that predicted BTT usage were: bone metastases (hazard ratio [HR] 4.4; 95% confidence interval [CI] 2.6–7.5) and visceral metastases (HR 3.6; 95% CI 1.8–7.2) at CRPC diagnosis, symptomatic disease at mCRPC diagnosis (HR 1.5; 95% CI 1.1–2.1), and mCRPC diagnosis post–2012 (HR 1.5; 95% CI 1.1–2.0).
Conclusions: Most mCRPC patients with bone metastases received a BTT. Factors associated with BTT use were bone metastases at CRPC diagnosis, mCRPC diagnosis after 2012, and symptomatic disease at mCRPC diagnosis.

UP–11.4

Changes in risk group stratification of patients undergoing radical prostatectomy at the Southern Alberta Institute of Urology over time

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Introduction: Prostate cancer is the most common cancer among men, but overall mortality rates remain low due to the preponderance of low–risk disease. The past decade has seen a shift towards more conservative management in low–risk prostate cancer, and active surveillance in particular, in order to minimize unnecessary intervention and morbidity. This study aimed to evaluate the number of low–risk radical prostatectomies (RP) being performed at the Southern Alberta Institute of Urology over a nine–year period.
Methods: We retrospectively reviewed all patients who underwent RP from 2005–2013 at our institution. Patients were stratified according to D'Amico risk classification based on 12–core transrectal ultrasound guided biopsy (TRUS bx) results. RP findings are reported from February 2005–October 2013 to describe concordance between TRUS bx and RP, and surgical outcomes such as presence of extraprostatic extension (EPE, pT3a) or seminal vesicle invasion (SVI, pT3b), positive surgical margins, and positive lymph node involvement. Basic descriptive analyses were used for this study.
Results: Two–thousand two–hundred and twenty RPs were performed over the study period. Overall, 36.3% of these were performed on men with low–risk prostate cancer. From 2005–2013, the proportion of RPs that were performed for low–risk prostate cancer dropped steadily from 54.0% to 15.1%. Only 4% of patients who underwent RP for low–risk disease had significant pathological upgrading .
Conclusions: The proportion of patients undergoing RP at our centre for low–risk prostate cancer significantly decreased over the nine years evaluated in this study, reflecting the current global trend towards the use of active surveillance in the management of low–risk prostate cancer.

UP–11.5

Surgical margin status in open radical prostatectomy: Community experience with a two–urologist model

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Introduction: There has been increased scrutiny of surgical outcomes in radical prostatectomy and we wanted to know how our outcomes compared to published results initially in terms of surgical margin status. We are a group of three urologists that all perform open radical retropubic prostatectomies (RRP). We assist each other on these and all major cancer operations. We present the surgical margins from our experience over the last six years.
Methods: We retrospectively analyzed a six–year consecutive series of open RRPs in a community urology practice setting with three urologists all performing open RRP. The assistant was typically another urologist. We examined intraoperative complication rate, length of stay, and postoperative outcomes, including surgical margin status, urinary continence, and erectile function. We report here on surgical margin status as a surrogate for operative quality.
Results: Two hundred twenty–eight RRPs were performed in the last six years, with an average patient age of 63.8±5.7 years. Thirteen (6%) had Gleason 6 disease, 155 (68%) had Gleason 7 disease, and 60 (26%) had Gleason 8 or greater disease. One hundred fifty–two (67%) had pathological stage T2 disease and 76 (33%) had pathological stage T3 disease. The overall positive surgical margins were 18%. Of the 152 patients with stage T2 disease, 18 (12%) had positive margins, and of the 76 patients with stage T3 disease, 24 (30 %) had positive margins.
Conclusions: In our series, open RRP performed in a community setting with two urologists has pathological outcomes that compare well to published results from high–volume centres. It is well–established that outcomes are, in part, volume–driven. We believe this two–surgeon model improves quality in terms of surgical outcomes by virtue of increased operative volume for both the surgeon and the assistant.

UP–11.6

Trends in radical prostatectomy risk group distribution at the University of Alberta

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Study Groups: Petra Uro–Group members have assisted in design.
Introduction: Active surveillance has been increasingly proposed as the preferential primary treatment strategy for very–low–risk (VLR) and low–risk (LR) clinically localized prostate cancer (CLPC), whereas radical prostatectomy has been increasingly recommended for high–risk (HR) CLPC.[1] The extent to which "real–world" Canadian clinical practice follows these recommendations is unknown. The primary objective of the current study was to examine trends in risk group distribution of men undergoing radical prostatectomy.
Methods: A retrospective analysis of prospectively collected data from the University of Alberta (UA) Radical Prostatectomy Database was performed. A total of 1806 consecutive men who underwent radical prostatectomy for CLPC between September 2007 and January 2013 were analyzed (Table 1; available at *https://cua.guide/*). The main outcome measure was clinical risk group per year of surgery. Generalized linear models and cumulative logit were used to examine trends in risk group distribution per year of surgery. Statistical tests were two–sided ($p \leq 0.05$).
Results: The absolute number of radical prostatectomy cases per year was dynamic: 262, 313, 378, 308, and 241 in 2008, 2009, 2010, 2011, and 2012, respectively. Patient demographics are listed in Table 2 (available at *https://cua.guide/*). Overall, the proportion of VLR–CLPC and LR–CLPC cases decreased over time, whereas the number of intermediate risk–CLPC and HR–CLPC cases increased over time ($p<0.0001$) (Fig. 1; available at *https://cua.guide/*). For example, the proportion of LR–CLPC cases was 21.1%, 39.7%, 30.7%, 25.4%, 21.1%, and 17.4% in 2007, 2008, 2009, 2010, 2011, and 2012, respectively (Fig. 2; available at *https://cua.guide/*).
Conclusions: The analysis confirmed the risk profile of men undergoing radical prostatectomy shifting away from the most favourable disease spectrum. Men with CLPC considered suitable for active surveillance comprised a decreasing share of the total proportion of radical prostatectomy procedures performed. Intermediate– and high–risk disease comprised an increasing share of all radical prostatectomies.
Reference:
1. Tosoian JJ, Trock BJ, Landis P, et al. Active surveillance program for prostate cancer: An update of the Johns Hopkins experience. *J Clin Oncol* 2011;29:2185–90. https://doi.org/10.1200/JCO.2010.32.8112

UP–11.7

Cognitive vs. software–based fusion of magnetic resonance imaging (MRI) and real–time ultrasound for targeted biopsy of suspicious lesions on prostate MRI

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Introduction: Evidence supports the use of magnetic resonace imaging (MRI) in patients with persistent suspicion of prostate cancer despite prior negative biopsy. However, the optimal method of target localization remains unknown. We thought to compare cognitive (COG) vs. software–based fusion (FUS) for targeted biopsy in patients with suspicious lesions on MRI in a prospective cohort.

Methods: Patients were referred for prostate biopsy based on the presence of a suspicious lesion on MRI. Prostate Imaging Reporting and Data System (PIRADS) 3–5 were deemed suspicious and targeted biopsy was suggested. The initial 39 patients underwent COG targeted biopsy of suspicious lesion on MRI, whereby the urologist tried to localize to a specific sextant based on the MRI report. The subsequent 41 patients underwent FUS using the Koelis Trinity System. Patients received 2–4 targeted biopsies in suspicious lesions and a standard sextant biopsy if no prior prostate biopsy. Cancer detection rates were calculated and Fisher's two–sided p–value test was used to compare results between COG and FUS patients.

Results: The median age and prostate–specific antigen (PSA) of the cohort were 63.5 years and 6.3 ng/ml, respectively. The number of patients with PIRADS 3,4, and 5 were 22, 48, and 8, respectively. The cancer detection rate was 24/39 (61.5%) and 30/41 (73.2%) in the COG and the FUS groups, respectively (p=0.34). The high–grade (Gleason 7–10) cancer detection rates were 19/39 (48.7%) and 25/41 (61.0%) in the COG and the FUS groups, respectively (p=0.37). The high–grade (Gleason 7–10) cancer detection rates were 16/23 (70%) and 27/33 (81.8%) in the COG and the FUS groups, respectively (p=0.34).

Conclusions: Both COG and FUS targeted biopsy techniques demonstrate improved biopsy detection rates compared to published data with sextant biopsy. There was a trend for improved cancer detection with FUS targeted biopsy that requires further study to confirm.

UP–11.8

Clinical impact of magnetic resonance imaging (MRI)–guided biopsy on prostate cancer treatment: A single surgeon experience of cognitive–guided and MRI–ultrasound fusion biopsy

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Introduction: Multiparametric magnetic resonance imaging (mpMRI) of the prostate improves the diagnostic accuracy of biopsy for prostate cancer.[1,2] We aim to evaluate the clinical impact of directed biopsies under MRI guidance on management in addition to routine systematic biopsy (SB).[3,4] We also compare the use of MRI–informed cognitive–guided biopsy (CB) to MRI–ultrasound fusion (FB).

Methods: This is a single–surgeon series from January 2015 to July 2017. Cores targeting index lesions were sent as separate specimen. FB was performed using BioJet™ Fusion Software System. Patient data was accessed to assess: 1) improvement in cancer detection; 2) if information from directed biopsies resulted in changes in management; and 3) pattern of use of CB and FB in the era of mpMRI.

Results: A total of 119 men with Prostate Imaging Reporting and Data System (PIRADS) 3–5 lesions were studied; 92 had cancer diagnosed. Mean age was 64 years, prostate–specific antigen (PSA) 7.96, and prostate volume 55 cc. On average, 24 cores was taken for SB and four for guided biopsy. Higher number of positive cores were identified via guided biopsy (57% vs. SB 42%; p <0.01). Six had disease present on directed cores only and Gleason score was upgraded in 15. Based on targeted biopsy, management decision was altered in 19: two were placed on active surveillance and 17 had definitive therapy (radical prostatectomy or radiotherapy), with pelvic lymph node dissection performed in two cases (for high–risk disease). Of these, 16 had PIRADS 4 or 5 lesions. There was no difference in cancer detection (p =0.23) and change in management (p =0.85) between CB and FB (Table 1; available at *https://cua.guide/*).

Conclusions: Overall, cancer was detected in 5% of men on directed biopsy that would have been missed on systematic sampling and 13% had final Gleason scores upgraded. Twenty percent of men with PIRADS 4/5 lesions had change in management based on directed cores. No significant difference was observed between CB and FB regarding disease characteristics or management. This is the only Australian single–surgeon series specifically examining the role of directed biopsies under MRI guidance.

References:

1. Babaian RJ, Toi A, Kamoi K, et al. A comparative analysis of sextant and an extended 11–core multisite directed biopsy strategy. *J Urol* 2000;163:152–7. https://doi.org/10.1016/S0022–5347(05)67993–1
2. Wysock JS, Rosenkrantz AB, Huang WC, et al. A prospective, blinded comparison of magnetic resonance (MR) imaging–ultrasound fusion and visual estimation in the performance of MR–targeted prostate biopsy: The PROFUS trial. *Eur Urol* 2014;66:343–51. https://doi.org/10.1016/j.eururo.2013.10.048
3. Presti JC, O'dowd GJ, Miller MC, et al. Extended peripheral zone biopsy schemes increase cancer detection rates and minimize variance in prostate–specific antigen and age–related cancer rates: Results of a community multipractice study. *J Uurol* 2003;169:125–9. https://doi.org/10.1016/S0022–5347(05)64051–7
4. Eskew LA, Bare RL, McCullough DL. Systematic 5–region prostate biopsy is superior to sextant method for diagnosing carcinoma of the prostate. *J Urol* 1997;157:199–203. https://doi.org/10.1016/S0022–5347(01)65322–9

UP–11.9

Evaluation of IKKε as a therapeutic target in advanced prostate cancer

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Introduction: Prostate cancer (PCa) is the third most common cause of cancer–related death in Canadian men. Advanced PCa often evolves from a hormonosensitive (HS) to a lethal castration–resistant (CR) state. Our lab has previously demonstrated that CR cells exhibited a constitutive overexpression of IKKε. The tumour growth was significantly decreased when cells were depleted in IKKε. We also showed that IKKε expression regulated the C/EBP–β transcription factor to activate the IL–6 promotor. We believe that IKKε is likely implicated in the development of CR. Since senescence induced by androgen deprivation promotes the maintenance of HS state in PCa cells, we hypothesize that IKKε expression prevents androgen deprivation therapy (ADT)–induced senescence.

Methods: In our laboratory, we have two CR cell lines and two HS cell lines. DU145 cell lines are subcutaneously injected in our mouse model, and when the tumour reaches 400 mm^3, BX795 is administered intra–peritoneal.

Results: Proliferation of CR cells dramatically decreased by BX795 administration compared to HS cells. This was confirmed by EdU incorporation assay. After four days of treatment, CR cells have an increased SA–b–galactosidase staining, whereas the HS cells do not stain. After six days of treatment, the size of CR cells increased compared to HS cells. The inhibition of IKKe activity by BX795 also increased p21 and p15 in CR cells. Moreover, the treatment induced a polynuclear morphology in CR cell lines. Overall, BX795 injection in a mouse model results in a decrease in tumour volume while having no effect on mouse behaviour and body weight.

Conclusions: Our study suggests that IKKε is likely involved in PCa progression and that inhibiting its activity in CR cells, they express a senescent phenotype. These results suggest a possible involvement of IKKε in the development of a CR state and justifies further studies addressing the potential of IKKε as a therapeutic target.

Poster Session 12: Other Oncology III
June 26, 2018; 0800–0930

MP–12.1
Development of a patient decision aid for complex, localized renal masses

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Introduction: Patient decision aids are structured clinical tools that facilitate shared decision–making. Decision aids present therapeutic options, including their risks and benefits, in an evidence–based fashion and help patients communicate their values. In urology, one of the most challenging decisions is between an open partial nephrectomy and a laparoscopic radical nephrectomy to remove a complex renal mass. We sought to develop and evaluate a patient decision aid for this population.

Methods: The International Patient Decision Aids Standards (IPDAS) and the Ottawa Decision Support Framework were used to guide the systematic development of the decision aid. A comprehensive review of the literature was performed to identify evidence on options for management of complex, localized renal masses (cT1b–T2). The content of the decision aid was agreed upon by content and methodological experts using an iterative feedback process. A mixed methods survey was created to assess the decision aid. Patients and urologists were recruited to evaluate the decision aid.

Results: A structured patient decision aid presented evidence on options, including probabilities of benefits and risks. Open partial nephrectomy, laparoscopic radical nephrectomy, and observation were the defined management options. Included outcomes were: bleeding, urine leak, length of stay, renal failure, and survival. Simple language and pictures were used to present data at a level suitable for a wide range of patients. A validated screening tool (SURE test) was included to assess patients' decisional conflict. Knowledge questions were included to verify patients' understanding. The decision aid met all IPDAS criteria to be defined as a decision aid, five of six certification criteria, and 17 of 23 quality criteria.

Conclusions: A patient decision aid was created to facilitate shared–decision making for patients with complex renal masses. The effectiveness of our decision aid is currently being evaluated prospectively.

MP–12.2
Predicting perioperative complications in patients receiving radical cystectomy using preoperative computed tomography–measured adipose tissue indices

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Introduction: Obesity is a global epidemic, but the link between obesity and bladder cancer outcomes remains controversial. Recent studies have suggested body mass index (BMI) may not be the best measure of obesity. In this study, visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) levels were measured with computed tomography (CT) scans prior to radical cystectomy (RC). The hypothesis was that patients with higher adipose levels would have poorer perioperative and survival outcomes.

Methods: A total of 202 patients undergoing RC were included in this single–centre, retrospective study (2000–2012). Multivariable logistic regression was used to generate odds ratios (OR) for predictors of 30–day Grade III–V Clavien–Dindo (CD) complications, and linear regression was used to assess predictors of increasing length of stay (LOS). Multivariable competing risks and Cox proportional hazards models were used to assess disease–specific (DSS) and overall survival (OS), respectively.

Results: The median age was 70 years (interquartile range [IQR] 78–60), VAT 165 cm^2 (IQR 223–114), SAT 233 cm^2 (IQR 316–182), LOS 9 days (IQR 12–7), and age–adjusted Charlson Comorbidity Index (CCI) score was 6 (IQR 8–5). Most patients (76%) were male, 59% were smokers, there were 32 (16%) 30–day Grade III–V complications, 71% had ≥pT2 disease, and 40% received chemotherapy. Over a median followup of 37 months (IQR 54–27) for alive patients, there were 43 (21%) bladder cancer and 65 (32%) all–cause deaths. Adjusting for CCI and smoking status, SAT predicted Grade III–V 30–day complications (OR 1.004; 95% confidence intervcal [CI] 1.001–1.008). VAT predicted increasing LOS (ß–coef 0.0233; 95% CI 0.0002–0.0463) when adjusted for CCI and gender. Neither VAT nor SAT predicted DSS or OS.

Conclusions: We demonstrated that higher VAT predicted longer postoperative LOS, and SAT predicted worse complications (CD III–V) 30 days after RC. There was no difference in DSS or OS between groups. VAT and SAT may help improve preoperative risk assessment for patients undergoing RC.

MP–12.3
The association of chronic kidney disease with tumour recurrence and mortality following radical cystectomy for urothelial carcinoma

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Introduction: Chronic kidney disease (CKD) has been identified as a potential risk factor for disease recurrence and mortality in a variety of malignancies. We, therefore, evaluated the association between preoperative CKD and outcomes following radical cystectomy (RC) for urothelial carcinoma (UC).

Methods: We identified 1234 patients who underwent RC without neoadjuvant chemotherapy at Mayo Clinic for UC and who had a preoperative serum creatinine measurement available (1980–2016). Patients were stratified according to the presence or absence of preoperative CKD (defined as estimated glomerular filtration rate <60 ml/min/1.73m^2). The associations between CKD and non–urothelial cancer recurrence (CR), cancer–specific mortality (CSM), and all–cause mortality (ACM) were examined using multivariable competing risk analysis.

Results: A total of 550 (44.6%) patients were classified with preoperative CKD. Patients with CKD were older (median 72.7 years vs. 67.4 years; p<0.001), more likely to be female (23.5% vs. 17.1%; p=0.006), and had a higher pT stage (pT3/4 in 40.2% vs. 29.4%; p<0.001). Median followup after RC was 10.7 years (interquartile range [IQR] 6.4, 18.7), during which time 488 patients experienced recurrence and 988 patients died. In multivariable competing risk analysis, we found that preoperative CKD was not independently associated with either CR (hazard ratio [HR] 1.06; 95% confidence interval [CI] 0.88–1.14; p=0.53) or CSM (HR 1.05; 95% CI 0.86–1.30). However, patients with CKD had a significantly increased risk of ACM after RC compared to patients without CKD (HR 1.18; 95% CI 1.03–1.33; p=0.02). Similar results were noted when analyzing estimated glomerular filtration rate as a continuous variable and when categorizing patients according to CKD stage.

Conclusions: The presence of baseline CKD is associated with an increased risk of ACM after RC, but does not appear to independently influence cancer–specific outcomes.

MP–12.4

Trends and disparities in the receipt of definitive treatment for clinically localized, muscle–invasive urothelial carcinoma

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Introduction: Previous studies have documented underuse of potentially curative local therapies, including radical cystectomy (RC), partial cystectomy (PC), or chemoradiation (CR), for patients with muscle–invasive urothelial carcinoma of the bladder (MIBC). Herein, we examine trends in the treatment of MIBC and evaluate factors associated with the receipt of definitive local therapies.

Methods: We identified all patients in the National Cancer Database who were diagnosed with cT2–cT4N0M0 MIBC between 2006 and 2014. The proportion of patients receiving various treatment modalities over time was examined and clinical and socioeconomic factors associated with the receipt of definitive local therapy (defined as RC, PC, or CR) were evaluated.

Results: We identified 43 152 patients with localized MIBC, of whom 22 545 (52.3%) received definitive local treatment, including 17 157 (39.8%) who underwent RC, 1031 (2.4%) treated with PC, and 4357 (10.1%) who received CR. A total of 4541 (10.5%) received chemotherapy alone, 2366 (5.5%) received radiation alone, and 13 700 (31.7%) received no/other treatment. We noted an increase in the proportion of patients with MIBC who were treated with RC over time, from 33.1% in 2006 to 41.1% in 2014 (p<0.001), with a concurrent decrease in the proportion of patients receiving chemotherapy alone and those receiving no/other treatments (Fig. 1; available at *https://cua.guide/*). In multivariable analysis, factors associated with lower use of definitive local treatment included older age, increased number of comorbidities, cT4 or cT2 stage (vs. cT3), African American race, no insurance or non–government insurance, and treatment at a non–academic facility (all p<0.01).

Conclusions: A significant number of patients with MIBC continue to not receive definitive local therapy. Although some of these patients may be ineligible for such treatments, efforts aimed at mitigating the disparities identified herein may improve the outcomes for patients with MIBC.

MP–12.5

The influence of 5–alpha reductase inhibitor use on pathological features of muscle–invasive bladder cancer at radical cystectomy

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Study Groups: CHU de Québec.

Introduction: Recent research suggests 5–alpha reductase inhibitors (5ARIs) may slow the progression of non–muscle–invasive bladder cancer.[1] Further, 5–alpha reductase expression is upregulated in 23% of muscle–invasive bladder cancer (MIBC) specimens from the Cancer Genome Altas (TCGA) study.[2] In this study, we assess whether patient use of 5ARIs influences the findings on surgical pathology at the time of radical cystectomy(RC) for MIBC.

Methods: We retrospectively reviewed the last consecutive 572 patients who underwent RC at our tertiary referral institution between 2009 and 2017. Men were included who had urothelial cancer in the RC specimen. Patients who underwent a RC for non–urothelial pathology (e.g., adenocarcinoma) or had no cancer in the specimen were excluded. Data for pathological stage and synoptic features were collected in a database, as was preoperative use of 5ARIs, metformin, and statins. Chi–squared tests were used to compare proportions between groups.

Results: Following exclusions, our cohort included 338 men with urothelial cancer in the RC specimen. Forty–eight (14%) patients were taking dutasteride or finasteride at time of RC, while 58 (17%) were taking metformin and 195 (58%) statins. There was a non–significant trend for those who took 5ARIs to have a lower incidence of positive margins (p=0.08) and lymphovascular invasion (p=0.05). No significant difference in nodal status, T–stage, or presence of carcinoma in situ was found. When patients with urothelial carcinoma variants[3] present in the RC specimen were excluded, there was a significantly lower incidence of positive margins (p=0.02), lymphovascular invasion (p=0.002), and perineural invasion (p=0.01) among 5ARI users. When performing identical analyses for metformin or statin use, no significant differences were found.

Conclusions: This study is the first to suggest the use of 5ARIs may exert a protective biologic effect on the invasive properties of high–grade urothelial carcinoma. Further validation and research is needed to understand the therapeutic implications.

References:

1. Shiota M, Kiyoshima K, Yokomizo A, et al. Suppressed recurrent bladder cancer after androgen suppression with androgen–deprivation therapy or 5α-reductase inhibitor. *J Urol* 2017;197:308–13. https://doi.org/10.1016/j.juro.2016.08.006
2. Cancer Genome Atlas Research Network. Comprehensive molecular characterization of urothelial bladder carcinoma. *Nature* 2014;507:315–22. https://doi.org/10.1038/nature12965
3. Chalasani V, Chin JL, Izawa JI. Histologic variants of urothelial bladder cancer and nonurothelial histology in bladder cancer. *Can Urol Assoc J* 2009;3:S193–8. https://doi.org/10.5489/cuaj.1195

MP–12.6

Patient who progress following radical cystectomy: Who gets palliative care? Unconscious bias in referral patterns

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Introduction: In patients with advanced abdominopelvic malignancies, palliative care has been shown to improve quality of life, mood, reduce hospital admissions, and improve survival.[1,2] In 2016, the American College of Clinical Oncologists recommended that all patients with advanced malignancies receive palliative care.[3] This study investigates factors that determine which bladder cancer patients receive palliative care.

Methods: Retrospective data were collected from the National Cancer Database. A total of 412 588 patients were identified in the database with bladder cancer; 5163 of these patients received palliative care. We used a multivariable logistic regression model to identify independent predictors of palliative care. These included age, gender, insured status, socioeconomic status, and hospital type and location.

Results: We compared 4406 patients who received palliative care to 362 257 patients who did not. Independent predictors of palliative care included: female gender (p<0.001), age under 60 (p=0.012), Medicare insurance (p<0.001), low socioeconomic status (p<0.001), living in a smaller city (p=0.0015), lower degree of education (p<0.001), attending an academic centre (p=0.006), and Asian or African American race (p<0.001).

Conclusions: In patients with a bladder malignancy, individuals who belong to a minority race, are uneducated, poor, under 60, on medicare, attended an academic centre, or live in a city under 250 000 have an increased probability of receiving palliative care. Limitations of this study include unmeasured confounders, such as palliative care refusal due to personal or cultural beliefs or lack of referral. Regardless, this study demonstrates that variables often associated with decreased social privilege unexpectedly increase the likelihood of receiving palliative care. These findings provide a unique perspective towards access to healthcare resources, which are often underused in underprivileged individuals.

References:

1. Bakitas MA, Tosteson TD, Li Z, et al. Early vs. delayed initiation of concurrent palliative oncology care: Patient outcomes in the ENABLE III randomized controlled trial. *J Clin Onc* 2017;33:13.

2. Higginson IJ, Evans CJ. What is the evidence that palliative care teams improve outcomes for cancer patients and their families? *The Cancer J* 2010;16:423–5. https://doi.org/10.1097/PPO.0b013e3181f684e5
3. Ferrell BR, Temel JS, Temin S, et al. Integration of palliative care into standard oncology care: ASCO clinical practice guideline update summary. *J Clin Onc*;13:119–22.

MP–12.7

Surveillance post–radio frequency ablation for small renal masses: Recurrence and followup

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Introduction: Small renal masses (SRMs), enhancing tumours <4 cm in diameter, are suspicious for renal cell carcinoma (RCC). The incidence of SRMs has risen with the increased quality and frequency of imaging. Partial nephrectomy is widely accepted as a nephron–sparing approach in the management of clinically localized RCC, with a greater than 90% disease–specific survival for stage T1a.[1] Radio frequency ablation (RFA) has been emerging as an alternative management strategy, although overall survival, recurrence rates, and followup strategy after RFA has not yet been clearly established. In this study, we aimed to evaluate the time to recurrence and recurrence rates of SRMs treated with RFA at our institution.

Methods: A retrospective review between October 2011 and April 2017 identified 84 patients with a single SRM treated with RFA at Hamilton Health Sciences and St. Joseph's Healthcare Hamilton. Patients with familial syndromes and distant metastases were excluded. Repeat RFAs of the ipsilateral kidney for incomplete ablation were not considered a new procedure. The primary variable measured was time from initial ablation to recurrence. A Cox proportional hazard regression model was used to identify possible prognostic variables defined *a priori,* including age, gender, and mass size, as well as RENAL nephrometry and PADUA scores.

Results: The overall average age of our patients was 68.6±10.6 years, with 71% being male. Average tumour size was 2.42±0.81 cm. There was a total of 4/84 total recurrences (4.8%) post–RFA. Those without recurrence had median followup of 41 months. Those with recurrences had median time to recurrence of 17 and no recurrence beyond 30 months. Five of 84 patients had residual disease (6%) and were identified within the first eight months post–RFA. The only prognostic variable identified as a predictor of residual disease was tumour size (hazard ratio 2.402; p=0.047).

Conclusions: This study shows the risk of recurrence following RFA for SRMs is 4.8%. Most recurrences were a result of residual tumour at the ablation site identified within the first nine months post–RFA. No recurrences were identified beyond 30 months. Tumour size alone, without need for complex scoring systems, may serve as a predictor of incomplete ablation following RFA.

Reference:

1. Jewett M, Rendon R, Lacombe L, et al. Canadian guidelines for the management of small renal masses (SRM). *Can Urol Assoc J* 2015;9:160–3. https://doi.org/10.5489/cuaj.2969

MP–12.8

Outcomes of metastasectomy in metastatic renal cell carcinoma patients: The Canadian Kidney Cancer information system experience

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Introduction: Over 25% of patients are diagnosed with metastasis at the time of renal cell carcinoma (RCC) diagnosis and 35% will eventually progress to the metastatic stage. Surgical resection of metastasis can be integrated in the management of mRCC, as it can contribute to delay disease progression and improve survival. With the availability of a pan–Canadian database, this study assessed the impact of metastasectomy in mRCC patients using real–world Canadian data.

Methods: The Canadian Kidney Cancer information system (CKCis) database was used to select patients who were diagnosed with mRCC between January 2011 and December 2016. Patients diagnosed with mRCC and with pathological confirmation of RCC were included in the analysis. The date of first diagnosis of metastasis was considered as the index date. Patients were stratified depending on whether they had a metastasectomy (complete or incomplete) and no metastasectomy, and then matched to minimize selection bias. Each patient having received metastasectomy was matched with up to 10 patients with no metastasectomy by age (over 65 year old), clear–cell RCC histology, pStage, and time to metastasis greater than one year. Overall survival (OS) was calculated from diagnosis of metastatic disease to death from any cause. A Cox proportional hazards model was used to identify the impact of the metastasectomy while adjusting for potential confounding variables.

Results: A total of 252 patients had complete (173 patients) and incomplete (79 patients) metastasectomy, while 1000 mRCC patients did not undergo a metastasectomy. Median time of followup since the date of mRCC diagnosis was 26 months (interquartile range [IQR] 14–43). At 12 months, 97.9%, 86.7%, and 75.3 % of patients were alive in the complete metastasectomy, incomplete metastasectomy, and no metastasectomy groups, respectively (p<0.001). Over 64% of patients who did not undergo a metastasectomy were treated with targeted therapy, compared with 70.8% and 41.0% in the incomplete metastasectomy and complete metastasectomy groups, respectively. Having clear–cell histology, being aged over 65 year at diagnosis of metastasis, and having bone, liver, or brain metastasis were all associated with increased risk of mortality. When patients were matched, having had a metastasectomy was still a predictor of survival (hazard ratio 0.45; p<0.001).

Conclusions: Our study revealed the positive effect of metastasectomy performed in mRCC with an improved OS compared to patients with no metastasectomy. Clear–cell histology, metachronous presentation, time to metastasis greater than one year, and younger age at presentation are all favourable factors of survival.

MP–12.9

Predictors of pathologically node–positive disease in patients undergoing retroperitoneal lymph node dissection for renal cell carcinoma: Results from the Canadian Kidney Cancer information system

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Introduction: A randomized trial[1] demonstrated that patients with clinically low–risk renal cell carcinoma (RCC) do not benefit from retroperi-

toneal lymph node dissection (RPLND), but the role of RPLND at time of nephrectomy for higher–risk tumours remains controversial. We hypothesize that patients with locally advanced disease have a worse prognosis and may benefit from nodal dissection. Here, we identify predictors of pathologically node–positive (pN1) disease in patients treated with RPLND at time of nephrectomy.

Methods: We analyzed data from a prospectively maintained multi–institutional cohort of patients in the Canadian Kidney Cancer Information System (CKCis) who underwent nephrectomy for RCC with or without RPLND from 2011–2017. Analysis was used to determine: 1) preoperative predictors of undergoing RPLND; and 2) predictors of pN1 in patients receiving RPLND.

Results: A total of 6084 patients with cT(any)N(any)M(any) RCC treated with partial (n=2788) or radical (n=3296) nephrectomy were identified; 886 (16%) patients had clinical T3–T4 disease, 322 (6%) had clinically positive nodes (cN1), and 504 (9%) had metastatic (M1) disease. One thousand seven hundred seventy–seven (29%) patients underwent RPLND. Of patients treated with RPLND, 248 (14%) had pN1 disease. Patients with Eastern Cooperative Oncology Group (ECOG) performance status (PS) >1, larger tumour size, stages cT2–T4 vs. T1, cN1, M1, and histological grades 3–4 were more likely to undergo RPLND at time of surgery. Predictors of pN1 disease were body mass index (BMI) 20–30 vs. BMI >30, ECOG PS >1, larger tumour size, stages cT2–T4 vs. cT1, cN1, M1, histological grades 3–4, and non–clear–cell histology (Table 1; available at *https://cua.guide/*).

Conclusions: In the largest study of its kind to date, several risk factors for pN1 status were identified. Of interest, BMI 20–30 and non–clear–cell histology have not been previously identified as predictors of pN1 disease and may, therefore, represent a novel subset of patients that could benefit from nodal dissection.

Reference:

1. Blom JH, Poppel VH, Marechal JM et al. Radical nephrectomy with and without lymph–node dissection: Final results of European Organization for Research and Treatment of Cancer (EORTC) randomized phase 3 trial 30881. *Eur Urol* 2009;55:28–34. https://doi.org/10.1016/j.eururo.2008.09.052

MP–12.10

Temporal trends in management and outcomes of testicular cancer: A population–based study

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Introduction: Treatment guidelines for early–stage testicular cancer have increasingly recommended de–escalation of therapy with surveillance strategies. We sought to describe temporal trends in routine clinical practice and whether de–escalation of therapy is associated with inferior survival in the general population.

Methods: The Ontario Cancer Registry was linked to electronic records of treatment to identify all patients diagnosed with testicular cancer treated with orchiectomy in Ontario from 2000–2010. Treatment after orchiectomy was classified as radiotherapy (RT), retroperitoneal lymph node dissection (RPLND), chemotherapy, or none. Surveillance was defined as no identified treatment within 90 days of orchiectomy. Overall (OS) and cancer–specific (CSS) survival were measured from date of orchiectomy.

Results: The study population included 1564 and 1086 cases of seminoma and non–seminoma (NSGCT), respectively. Among patients with seminoma there was a significant increase in the proportion of patients with no treatment within 90 days of orchiectomy (from 51% to 84%; p<0.001); use of RT decreased over time (38% to 8%; p<0.001) and use of chemotherapy remained stable (from 6% to 9%; p=0.289). Ninety–day post–orchiectomy practice patterns remained stable over time among patients with NSGCT: no treatment 51% to 57% (p=0.435); chemotherapy 43% to 43% (p=0.336); RPLND 9% to 3% (p=0.476). OS for the entire cohort at five and 10 years was 97% and 96%, respectovely; CSS was 98% and 98%. There was no significant change in OS or CSS for seminoma or NSGCT over the study period.

Conclusions: There has been substantial de–escalation in treatment of testicular cancer in routine practice since 2000. Long–term survival in routine practice is excellent and has not decreased with uptake of surveillance strategies.

MP–12.11

Does prior inguinoscrotal surgery alter recurrence patterns and survival outcome for patients with testitcular cancer? The Princess Margaret Cancer Centre experience

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Introduction: Inguinoscrotal surgery (ISS) before testicular cancer (TCa) diagnosis and treatment has historically been reportedly associated with altered drainage patterns. While inguinal lymph node metastases among all stage I TCa is approximately 2%, it is uncertain if men with prior ISS have similar recurrence patterns. We present the largest contemporary institutional series of patients with a history of prior ISS.

Methods: A retrospective review of a prospectively collected database of patients diagnosed with TCa between 1981 and 2016 was performed. Data on all men with TCa and history of prior ISS was analyzed.

Results: A total of 338 patients were identified, of which 267 had adequate records for analysis; 141 men had seminoma, of which 114 (80.9%) were on surveillance. Of these, 24 (21.1%) had recurrence and four (3.5%) were in the inguinoscrotal region (three had surgery and one received radiotherapy for their recurrence). Twenty–four men presented with metastatic disease at diagnosis; of these, three (12.5%) had inguinal disease and one (4.2%) had scrotal disease at presentation. Of the 126 men with non–seminomatous germ cell tumours (NSGCT), 50 (39.7%) were put on surveillance. Fourteen (28.0%) had recurrence; of these, one (2.0%) had inguinal recurrence and received chemotherapy. Sixty–six men presented with metastatic disease, of which seven (10.6%) had inguino–scrotal disease at presentation. Overall, recurrence in the inguinoscrotal region among all stage I men on surveillance was 3.0%. With a mean followup of five years after orchidectomy, the disease–free survival rates with seminoma and NSGCT on active surveillance were 98.2% and 98.0%, respectively. (Recurence patterns are shown in Fig. 1; available at *https://cua.guide/*.)

Conclusions: The risk of inguinoscrotal recurrence for men with prior ISS on surveillance for TCa is slightly higher than historical series; however, the disease–specific survival remains high. While inguinoscrotal recurrence rates are not insignificant, current surveillance strategies are adequate for capturing out–of–field recurrences.

MP–12.12

Nerve–sparing in retroperitoneal lymph node dissection for testicular cancer prevents postoperative retrograde ejaculation: A Canadian perspective

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Introduction: Retrograde ejaculation caused by injury to the preaortic sympathetic nerves is a significant postoperative complication following retroperitoneal lymph node dissection (RPLND). Large–volume U.S. centres demonstrate nerve–sparing (NS) to be successful in preserving antegrade ejaculation; however, few reports exist to describe its implementation at Canadian centres. Therefore, our study explores ejaculatory function in patients who underwent RPLND for testis cancer at a tertiary Canadian institution with and without the application of NS techniques.

Methods: All patients between December 2009 and June 2017 who underwent full bilateral RPLND for metastatic testicular malignancy in London, Ontario were identified using ICD–9 coding and retrospectively reviewed. All procedures were completed by a single uro–oncological surgeon. Nerve–sparing was performed when feasible based on patient and tumour factors. Data included clinical and pathological parameters and patient–reported ejaculatory function. All patients with complete data were included. Statistical analysis included Chi–square tests.
Results: A total of 24 patients (median age 27 year, interquartile range [IQR] 23–33) were included. Of the procedures, 13 involved NS and 11 were non–nerve–sparing (NNS). Of the NS group, all 13 patients (100%) reported antegrade ejaculation postoperatively, and only six (54.5%) reported an episode of antegrade ejaculation in the NNS group, which was significantly different ($p<0.01$).
Conclusions: Our findings confirm the superiority of NS technique compared to NNS in minimizing postoperative retrograde ejaculation in Canadian men. This has significant impact on quality of life and fertility potential. NS technique should be applied when possible for RPLND, and has implications for possible application to other surgeries in the infrarenal retroperitoneum.

MP–12.13
Combination of PD–1 blockade and OX40 stimulation for bladder cancer treatment
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Introduction: To escape from immune system, tumours regulate the expression of immune cell surface receptors called immune checkpoints (ICs). Inhibitory ICs, such as PD–1, curtail immune response and prevent automimmunity, whereas stimulatory ICs, such as OX40, regulate immune cell activation. Treatment with antagonistic or agonistic antibodies targeting ICs can rescue anti–tumour immune response. In advanced bladder cancer (BCa) patients, PD–1/PD–L1 inhibition resulted in 20–30% objective response rates. We hypothesize that the combination of PD–1 inhibition with OX40 stimulation could be more effective in rescuing the anti–tumour immune response. The aims of this study were to characterize PD–1 and OX40 expression in murine MBT–2 bladder tumours and to assess the effect of their modulation on tumour growth.
Methods: MBT–2 tumours, grown s.c. into C3H female mice, were dissociated and analyzed by multicolour flow cytometry for PD–1/PD–L1 and OX40/OX40L expression on tumour–infiltrating immune cell and tumour cell populations. IC blockade and/or stimulation were performed by 4 i.p. injections of anti–PD–1 and/or anti–OX40 antibodies. After 80 days, tumour–free mice were rechallenged to assess memory response.
Results: Among tumour infiltrating T lymphocytes, around 50% of CD8+ and 40% of CD4+ cells co–expressed PD–1 and OX40. Moreover, 30% of CD4+ cells were only OX40+ while 35% of CD8+ cells were only PD–1+. Treatments showed that PD–1 blockade induced a complete response rate (CRR) of 30%, whereas OX40 stimulation induced a CRR of 40%. However, when both therapies were combined, the CRR increased to 100%. All the latter mice survived rechallenge, indicating that the combined treatment induced a long–term memory response.
Conclusions: MBT–2 tumours are frequently infiltrated by PD–1+ and OX40+ T lymphocytes and PD–1/OX40 combined therapies resulted in a better response rate than those obtained with single–agent therapies. These results warrant further studies of this promising combination in clinical settings.

UP–12.1
Consolidation radical cystectomy for metastatic bladder cancer: Preliminary analysis from the University of Alberta
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Introduction: Data supporting the use of high–intensity local treatment (HILT) with radical cystectomy as a component of curative intent therapy for metastatic bladder cancer is lacking. The aim of the current study was to examine the safety and efficacy of consolidation radical cystectomy in patients with metastatic bladder cancer.
Methods: A retrospective analysis of prospectively collected data from the University of Alberta Radical Cystectomy Database was performed. Between August 2013 and August 2017, 15 consecutive patients underwent curative intent induction chemotherapy followed by consolidation radical cystectomy for histologically proven lymph node metastatic urothelial carcinoma of the bladder (cTanyN1–3M0) by a single urologic oncologist. The main outcome measures were 30–day mortality, 90–day mortality, and overall survival. The Kaplan–Meier method and descriptive statistics were used to analyze survival data.
Results: Data were evaluable for all 15 patients. The median age was 51 years (range 47–70). Thirteen patients (87%) were male and four patients (27%) received an orthotopic bladder substitution. No patient died within 90 days of surgery. The two–year overall survival rate was 52%.
Conclusions: These preliminary data suggest that HILT with consolidation radical cystectomy may be a safe and efficacious treatment strategy in selected patients with metastatic bladder cancer. Further study is warranted.

UP–12.2
Clinical outcomes of metastatic renal cell carcinoma patients undergoing complete or incomplete metastasectomy
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Introduction: Surgical resection of metastasis plays an important role in the management of metastatic renal cell carcinoma (mRCC) patients when aiming for complete remission. Complete and incomplete metastasectomy can potentially offer prolonged cancer control or symptoms palliation. The objective of this study is to evaluate the overall survival (OS) and progression–free survival (PFS) in patients undergoing complete and incomplete metastasectomy.
Methods: The Canadian Kidney Cancer information system (CKCis) database was used to select patients who were diagnosed with mRCC between January 2011 and December 2016. Study cohort includes patients diagnosed with mRCC and having received complete or incomplete metastasectomy during the study period. OS was calculated from time of metastasectomy until death from any cause using Kaplan–Meier (KM) curves. PFS was measured as time from metastasectomy until clinical progression, defined as diagnosis of new metastasis. A Cox proportional hazards model was used to identify the potential predictors of survival while adjusting for confounding variables.
Results: Overall, 252 patients were included in the analysis, with 68% (n=173) having received complete metastasectomy. Median time of followup since the date of the first metastasectomy was 19 months (interquartile range [IQR] 7–35). Patients undergoing incomplete metastasectomy

had more synchronous disease (44.3% vs. 28.9%; p<0.01), were treated more frequently with targeted therapy (70.9% vs. 40%; p<0.0001) and had more bone metastasectomy (29.1% vs. 14.5%; p<0.01). The five–year OS of patients receiving complete and incomplete metastasectomy was 59% and 28%, respectively (p<0.001). Having a metastasectomy for brain (hazard ratio [HR] 3.17; 95% confidence interval [CI] 1.32–7.60), liver (HR 5.64; 95% CI 1.22–25.98), or bones (HR 1.92; 95% CI 0.99–3.74) metastasis, as well as having received prior targeted therapy (HR 5.45; 95% CI 2.76–10.81) were all associated with higher risk of mortality. Yet, having received targeted therapy prior to metastasectomy was not associated with the progression (HR 1.06; 95% CI 0.5–1.9). Having a complete metastasectomy was independently associated with survival (HR 0.44; 95% CI 0.24–0.81).

Conclusions: Patients undergoing complete metastasectomy have better prognosis of survival than patient undergoing incomplete metastasectomy. Sites of metastasectomy, such as brain, liver, or bones metastasis, were associated with a poorer survival.

UP–12.3

Outcomes and prognosticators of pathological T4 renal cell carcinoma: Results from Canadian Kidney Cancer information system (CKCis)

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Introduction: The primary objective of this study was to study risk factors and outcomes in patients who underwent radical nephrectomy (RN) for renal cell carcinoma (RCC) where tumour invaded beyond Gerota's fascia, including contiguous extension into the ipsilateral adrenal gland (pT4). There is little data on the outcome of this specific subset of patients.

Methods: From 2009 to 2016, we identified 82 patients in the multicentre Canadian Kidney Cancer information system (CKCis) who underwent RN and were found to have pT4 RCC. Clinical, operative, and pathological variables were analyzed with univariate and multivariable Cox proportional hazard models to identify relevant factors associated with overall survival. Survival curves were estimated according to Kaplan–Meier methods and compared using the log–rank test.

Results: Median patient age was 62 years. Twenty–three (28%) patients had clinical stage T4 preoperatively, 20 (24%) had clinical N1 disease, and 33 (40%) had clinical M1 disease. There were 27 (33%) patients with pN1 and 32 (39%) were pM1. Median postoperative followup was 12 months (interquartile range [IQR] 3, 24). At last followup, eight (10%) patients were alive with no evidence of disease, 27 (33%) are alive with disease, and 36 (44%) died of disease. Patients with sarcomatoid characteristics (p=0.027) (Fig. 1; available at *https://cua.guide/*), non–clear–cell histology (p=0.03), and presence of systemic symptoms (p=0.045) had a significantly worse overall survival. Tumour histological subtype (clear–cell vs. non–clear–cell) (p=0.0032), tumour size (cm) (p=0.012), and Fuhrman grade (G4 vs. G2–G3) (p=0.045) were significantly associated with overall survival in multivariable Cox regression.

Conclusions: For patients with pT4 RCC after RN, survival is poor. More than three–quarters of patients (78%) were clinically understaged compared to their final pathology. Sarcomatoid features, non–clear–cell histology, and presence of systemic symptoms in particular were associated with worse overall survival.

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