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Moderated Poster Session 1: Basic Science, Best Practices, and Benign Disease

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MP1-01

Convective water vapor thermal therapy: 3-year durable outcomes of a randomized controlled study for treatment of lower urinary tract symptoms due to benign prostatic hyperplasia

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Introduction: Convective water vapor thermal therapy is a unique, minimally invasive procedure for rapid ablation of prostate obstructive tissue including the median lobe and hyperplastic central zone tissue. We report three-year outcomes of a randomized, controlled trial for treatment of moderate to severe lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH).

Methods: 197 men ≥50 years old with International Prostate Symptom Score (IPSS) ≥13, maximum flow rate (Qmax) ≤15 mL/s and prostate volume 30–80 cc, enrolled in 15 centers were randomized 2:1 to thermal therapy with Rezūm® System (136) or control (61). Control procedure was rigid cystoscopy with simulated active treatment sound. The total number of treatments in each lobe of the prostate was determined by the length of the prostatic urethra; it can be customized to the configuration of the gland including the median lobe/enlarged central zone. The primary endpoint compared IPSS reductions at 3 months after unblinding; evaluations continued annually for 3 years.

Results: Mean IPSS improvement by 3 months after thermal therapy was -11.2 vs. -4.3 points for control (p<0.0001), remaining durable with 50% improvements from baseline throughout 3 years (p<0.001). Commensurate 50% improvements in quality of life and Qmax were sustained over 3 years (p<0.0001). Ablation of the median lobe in 30/135 subjects resulted in significantly decreased PVR. At 36 months, PVR decrease was 61% of the mean baseline vs. 18% for subjects without a treated median lobe (p=0.0109). No late related adverse events occurred; no de novo erectile dysfunction was reported. The surgical retreatment rate was 4.4% (6/135), primarily due to failure to initially treat the median lobe in 4/135 (3%) subjects.

Conclusions: The 3-year results indicate that convective water vapor thermal therapy achieves rapid and durable relief of LUTS, quality of life, and flow rates and preservation of sexual function. This office or ambulatory outpatient procedure requires minimal anesthesia; subjects experience minimal transient perioperative side effects. The thermal therapy warrants positioning as a procedure for LUTS relief, both as an initial therapy vs. medications and as an alternative to transurethral surgery for selected patients.

MP1-02

Outcomes of endourologic intervention in patients with preoperative funguria

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Introduction: Funguria is encountered in 1–5% of cultured urine specimens and may be a result of specimen contamination, colonization, or invasive infection. The characteristics and outcomes of patients with funguria undergoing endourologic intervention have not been evaluated.

Methods: A retrospective review was performed to identify patients who had undergone ureteroscopy or percutaneous nephrolithotomy (PCNL) with preoperative funguria, defined as a urine culture containing >10 000 colony-forming units of fungus within 30 days of the operation. Patient demographics, comorbidities, and operative characteristics were recorded. Assessed outcomes included rates of postoperative systemic inflammatory response syndrome (SIRS), ICU admission, length of stay, and readmission.

Results: 65 patients with preoperative funguria were identified, 49 (75. 4%) who underwent ureteroscopy and 16 (24. 6%) who underwent PCNL. 32 patients' (49. 6%) cultures grew *Candida albicans*, 17 (26. 2%) grew *Candida glabrata*, and 16 (24. 6%) grew *Candida*, species not specified. 43 patients (66. 2%) were female, average age was 55.1±18.3 years, BMI was 31.8±11. 0, and Charlson Comorbidity Index was 2. 52±2.0. 23 patients (35. 4%) carried a diagnosis of neurogenic bladder, of whom 16 had an indwelling urethral or suprapubic catheter, 2 intermittently catheterized, and 2 had a urinary diversion. 57 patients (87. 7%) had been exposed to antibiotics in the 3 months prior to intervention. 42 patients (64. 6%) received antifungal treatment, of whom 8 received one perioperative dose while 34 received a full course of treatment. 18 (29. 2%) patients met SIRS criteria postoperatively and 11 (16. 9%) required ICU admission. 3 (4. 6%) and 2 (3. 1%) patients developed postoperative fungemia and bacteremia, respectively. All cases of fungemia were due to *C. glabrata*. Of 29 stone cultures performed, 25 (86. 2%) grew *Candida* species. 19 patients (29. 2%) were readmitted and no patients died within 30 days. On univariable analysis, presence of an indwelling catheter (p=0. 009), a known neurological diagnosis (p=0. 02), or *C. glabrata* on preoperative culture (p=0. 04), and longer operative time (p=0. 04) were predictive of developing post-operative SIRS. No significant predictors were identified on multivariable analysis. Notably, anti-fungal treatment, or lack thereof, was not associated with postoperative SIRS.

Conclusions: Patients with preoperative funguria have high rates of comorbid illness, urinary catheterization, and recent exposure to antibiotics. This patient population is at high risk of perioperative infectious complications after endourologic intervention.

MP1-03

Cost-effectiveness of diagnostic approaches for evaluation of renal colic: Accounting for the risk of radiation

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Introduction: The optimal diagnostic test to obtain for patients presenting with suspected renal colic is controversial. Initial use of ultrasound (US), despite frequently requiring additional diagnostic imaging, carries a lower average cost and radiation dose compared to use of standard-dose CT (SDCT) scan. Low-dose CT (LDCT) scan is an alternative approach that combines high sensitivity for detection of nephrolithiasis with significantly lowered radiation dose. We present the first known study comparing the cost-effectiveness of these three management approaches, accounting for the potential downstream costs of radiation-induced secondary malignancy.

Methods: A PubMed-based literature search was performed to identify model inputs, specifically the rate at which additional diagnostic interventions are required for each approach, population characteristics of renal colic patients, the radiation dose associated with each study, and medical costs associated with radiation-induced malignancy. Estimates of radiation-induced malignancy rates were obtained from the BEIR VII phase 2 report

with dose extrapolation using the linear no-threshold model. The cost of imaging was obtained from the CMS Medicare fee schedule.
Results: No approach was demonstrated to have superior clinical outcomes to any other. Radiation doses of SDCT and LDCT were 14. 1 mSv and 1. 54 mSv, respectively. Patients undergoing US and LDCT required subsequent SDCT in 33% and 13% of cases, respectively. Patients undergoing SDCT required subsequent US in 5% of cases. Use of LDCT after initial US could not be evaluated due to lack of available data. Average radiation dose was 3.4 mSv for initial LDCT compared to 4.7 mSv for initial US and 14.1 mSv for initial SDCT. Risk of radiation-induced malignancy in this cohort was .0076%/mSv. Average cost of US was $115.56, while cost of CT scan was $203.85 regardless of dose. Cost of radiation-induced malignancy was estimated to be $81 441. Direct costs from medical imaging were lowest with US at $184.56 compared to $209.63 for SDCT and $230.35 for LDCT. When including costs of radiation-induced malignancy, US remained the least expensive at $214.21, compared to $251.27 for LDCT and $297.21 for SDCT. Because initial US followed by as needed SDCT carried a greater radiation dose than initial LDCT, at a threshold of $50 000/QALY, initial LDCT is cost-effective over US if a case of radiation-induced malignancy carries a QALY loss of 6.92 years or greater.
Conclusions: This model suggests that initial US for evaluation of renal colic is the lowest cost option, while use of LDCT may be a reasonable alternative to minimize QALY lost due to downstream effects of ionizing radiation.

MP1-04

Thermal block of unmyelinated C-fibers in the tibial nerve of cats

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Introduction: Developing a method to reversibly block axonal conduction of afferent C-fibers may be valuable therapeutically for troublesome bladder conditions such as overactive bladder (OAB) or painful bladder syndrome (PBS). The goal of this study is to develop a thermal block method using a temperature range safe to the nerve.
Methods: We anesthetized 10 cats using α-chloralose and evaluated conduction of the unmyelinated C-fibers in the tibial nerve by recording evoked potentials. We first cooled each nerve (≤5°C) to achieve a complete conduction block, followed by heating the nerve to either 50°C for a short period (30–180 seconds) in group 1 or 45°C for 5–35 minutes in group 2. After the heating, the nerve block by cold temperature was then re-examined every 5–10 minutes for up to 2 hours.
Results: Without pre-heating, a reversible complete nerve block required an extremely cold temperature ≤5°C that is not safe for long-term application. In both groups 1 and 2, the pre-heating increased the cold temperature threshold required for a reversible complete nerve block to a temperature (10–20°C) that is much safer to the nerve. The effect of conduction block at room temperature often lasted for 0.5–2 hours depending on the duration of the pre-heating.
Conclusions: Many urologic conditions could be treated using an implantable device to block axonal conduction. Understanding the scientific effect of heating on cold block is critical in pursing these types of treatment devices and this study adds to the very limited body of literature on thermal block of axonal conduction.

MP1-05

My first 100 Urolifts®: Prostatic urethral lift (PUL) results in the real-world setting

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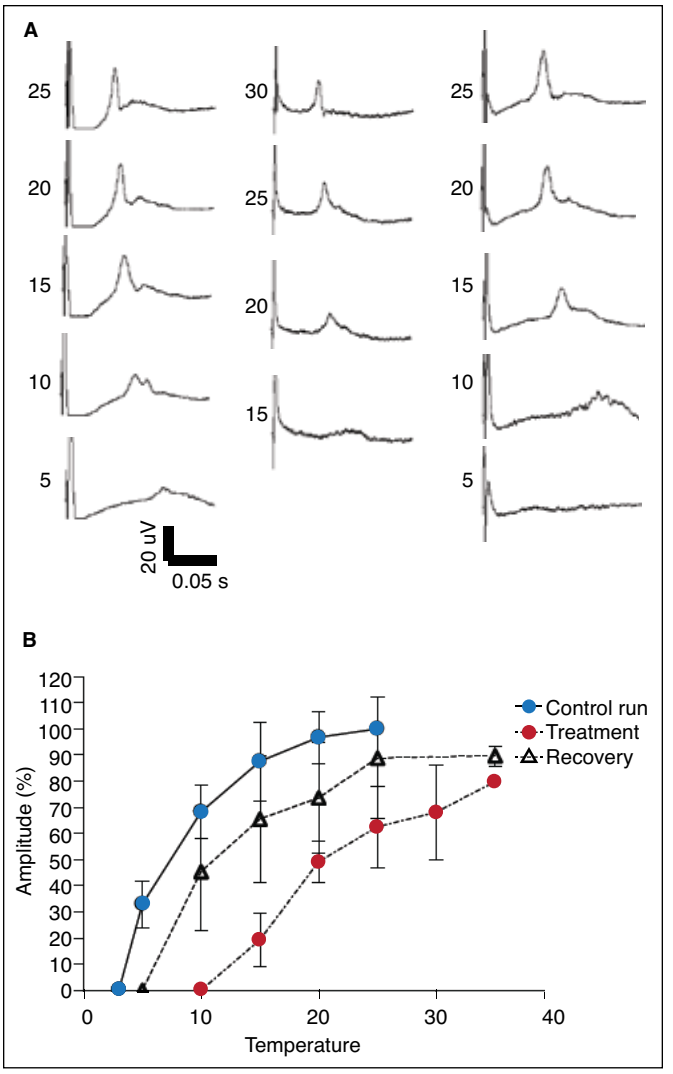
Introduction: The results of controlled, clinical studies have shown that the prostatic urethral lift (PUL) treatment for lower urinary tract symptoms (LUTS) for benign prostatic hyperplasia (BPH) offers rapid, significant, and durable relief of BPH symptoms with improved quality of life. Health professions would like to understand how PUL performs in the "real-world" setting and whether outcomes are similar to those seen in clinical studies.
Methods: Data was analyzed from patients treated at AMP Urology in Oneida, New York from October 2016 through April 2018. 100 men



MP1-04. Fig. 1.

who had symptomatic LUTS underwent the PUL procedure with UroLift® implants. All patients underwent conscious sedation with propofol in an outpatient setting. The International Prostate Symptom Score (IPSS), the peak flow rate (Qmax), and post-void residual volume (PVR) were evaluated preoperatively and postoperatively at 2–3 months. These results were compared to the published LIFT data with a student t-test.
Results: Average age at the time of treatment was 71±7 years and the baseline prostate volume was 48±18. Between 2 and 8 implants were placed in each patient (average 4.5, standard deviation 1.1, median 4). All patients were treated as day cases with no overnight hospital stays. No patient was given a catheter in the procedure room. For those patients who did not pass a voiding trial, a temporary catheter was placed (<5% of patients). IPSS score improvement at 2 months was 13.2 points (62% improvement), significantly better than the LIFT study results at a similar timepoint (Table 1). Peak flow rate improved by 8.8 ml/s (140%). The post-void residual volume decreased by 71 ml. These changes are statistically better than the LIFT trial results. Zero patients required re-operation.
Conclusions: The results of this single surgeon study are significantly better than the pivotal LIFT study results. The prostatic urethral lift reduced IPSS, improved peak flow rate, and reduced PVR at the 2–3-month followup timepoint for patients in a real-world setting. These outcomes indicate that PUL can be used in the real world safely and effectively.

MP1-05. Table 1. LIFT study data compared to real world data

		LIFT			AMP urology			
		n (paired)	Baseline	Change	n (paired)	Baseline	Change	p comparison
IPSS	2–3 months	136	22.3±5.5	-11.1±7.7	100	21.3±4.6	-13.2±4.7	0.01
Qmax	2–3 months	122	8.0±2.4	4.3±5.1	100	7.5±2.7	8.8±7.3	<0.0001
PVR	2–3 months	136	85±69	-9.0±86	100	121±106	-71±90	<0.0001

MP1-06
What defines a struvite stone?

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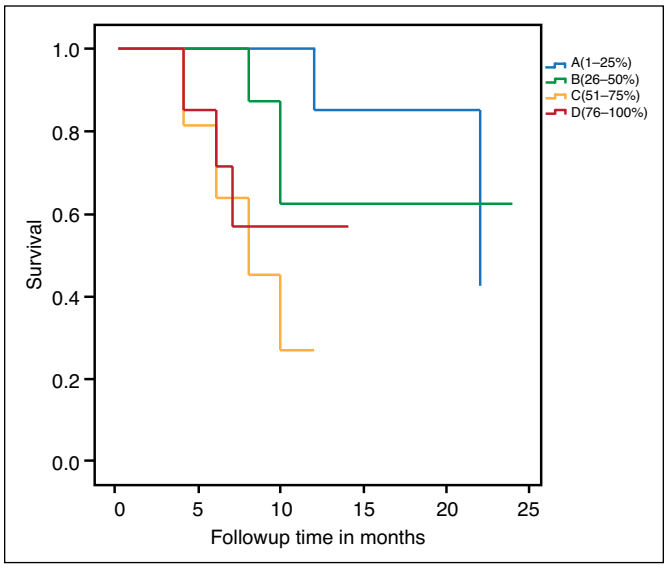
Introduction: Struvite stones only comprise a small fraction of urinary stones, but their medical and economic implications are disproportionately higher due to the strong association with infectious complications. The purpose of our study was to investigate the association between a stone's struvite content and clinical outcomes and to determine a clinically significant cutoff for defining struvite stones.

Methods: A retrospective study was conducted of all patients who underwent ureteroscopy or PCNL at our institution between 2012 and 2017, and had any component of struvite in the stone analysis. Patients were divided into four groups based on percent of struvite content: A (1–25%), B (26–50%), C (51–75%), and D (76–100%). Bacterial characteristics were compared between groups. Univariate and multivariate analyses were performed to evaluate the association between struvite content and postoperative SIRS. Log-rank test was used to compare between the four groups' recurrence rates.

Results: A total of 123 patients were included in the study. Positive preoperative urine culture was found in 31%, 81%, 87%, and 90% of patients from groups A, B, C, and D, respectively. *E.coli* was the most common pathogen in group A (54%), while *Proteus* was the most common pathogen in groups C (53%) and D (47%). Enterococci isolation rates remained similar between groups A–D, ranging from 23% to 33%. Postoperative SIRS occurred in 2.4%, 26.7%, 21.3%, and 47.4% of the patients from groups A, B, C, and D, respectively, and was associated with struvite content and age on multivariate analysis. Increasing struvite content was associated with a higher 2-year recurrence rate.

Conclusions: Higher struvite content is associated with a higher frequency of traditional urea splitting bacteria in urine culture, higher risk for postoperative SIRS, and higher recurrence rate. Struvite content greater than 25% can be used to define a clinically significant struvite stone.



MP1-06. Fig. 1. Kaplan-Meier curves for stone recurrence by groups A–D.

MP1-06. Table 1

Group (number of patients)	All (123)	A (42)	B (47)	C (15)	D (19)
Median age (IQR)	59 (54, 66)	59 (44, 70)	58 (54, 65)	58 (25, 61)	68 (59, 78)
Male gender (%)	41 (34.5)	22 (52.4)	14 (31.1)	2 (15.4)	3 (15.8)
Median BMI (IQR)	30.5 (27.7, 36.7)	29 (24.9, 34.3)	30.3 (28.7, 38.6)	33 (29.1, 41.6)	32 (24.8, 35.5)
Neurogenic bladder (%)	16 (13)	0 (0)	8 (17)	5 (33)	4 (21)
Indwelling catheters (%)	25 (21.1)	0 (0)	14 (31)	7 (53.8)	4 (22.3)
Median Charleston Comorbidity Index (range)		1 (0, 4)	2 (1, 4)	1 (0, 3)	5 (2, 7)
Median cumulative stone size in mm (IQR)	20 (12, 31)	15 (8.5, 25)	20 (16, 34.5)	25 (19, 29)	23 (20, 44)
PCNL (%)	42 (35)	8 (19.5)	17 (37.8)	7 (46.7)	10 (52.6)
Positive preop urine culture (%)	81 (65.9)	13 (31)	38 (80.9)	13 (86.7)	17 (89.5)
Prior UTIs (%)	38 (31.9)	2 (4.8)	16 (35.6)	9 (69.2)	11 (57.9)
Post operative SIRS (%)	24 (19.5)	1 (2.4)	10 (21.3)	4 (26.7)	9 (47.4)
After PCNL (%)	16 (38.1)	1 (12.5)	7 (41.1)	2 (28.5)	5 (33.3)
After ureteroscopy (%)	8 (10.2)	0 (0)	3 (10.7)	2 (25)	4 (30.7)
Median length of stay (IQR)	1 (0, 3)	0 (0, 1)	2 (0, 3)	4 (1, 7)	2 (1, 4)

MP1-07

Aquablation of the prostate: Canadian experience

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Introduction: Current standard of care for the treatment benign prostatic hyperplasia (BPH) in large sized glands (>80 g) include simple prostatectomy and holmium laser enucleation of the prostate. Evidence supports the safety and effectiveness of aquablation for prostate resection to treat lower urinary tract symptoms due to BPH**.** We sought to assess the efficacy and safety of robotically executed aquablation in prostate glands >80g in a Canadian cohort of patients. This subset of patients were part of the Water II clinical trial.

Methods: From September to December 2017, 19 men with moderate to severe BPH symptoms and prostate volume of 80–150 g underwent aquablation in 3 Canadian academic centers as part of a prospective, multicenter clinical trial. Included patients were men from 45–80 years of age with a prostate volume between 80 and 150 g as measured by transrectal ultrasound. Participants were also required to have a baseline IPSS ≥12, and a Qmax <15 mL/s. Questionnaires (IPSS, IIEF-5, and MSHQ-EjD), uroflowmetry, PVR, and laboratory tests were required preoperatively and at postoperative visits at 1 and 3 months. Adverse events were classified using the Clavien-Dindo (CD) classification. Aquablation was performed using the AquaBeamSystem (PROCEPT BioRobotics, Redwood City, California, U.S.), which incorporates high pressure water to ablate prostate tissue.

Results: 19 subjects who met inclusion and exclusion criteria were enrolled. Study procedures were performed under spinal anesthesia. Prostate volume ranged from 80–148 cc with a mean volume of 106 cc. A middle lobe was present in 74% of cases. Mean operative time, defined as hand piece placement until final urinary catheter placement, was 33.7±7.8 minutes. The mean aquablation resection time was 9.0±2.4 minutes. None of the patients necessitated post-aquablation cautery for hemostasis. The average length of stay following the procedure was 1.3±0.8 days. Mean pre-, 1-month, and 3-month post-treatment IPSS scores were 21.2, 9.9, and 5.0, respectively. Mean pre-, 1-month, and 3-month post-treatment Qmax were 6.6, 19.5, and 23.1 ml/s, respectively. The CD grade 1 events consisted of ejaculatory dysfunction (32%). The CD grade 2 or higher events consisted of five voiding events (frequency, urgency, or dysuria) and one urinary tract infection. There were no reports of blood transfusions.

Conclusions: For patients with large prostates who would typically undergo simple prostatectomy, aquablation appears to provide a reasonable surgical alternative that may markedly reduce operative time, length of hospital stay, and transfusion rates.

MP1-08

Trends and predictors of 30-day readmissions following percutaneous nephrolithotomy in kidney stones formers and implications for readmissions-based quality metrics

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Introduction: The use of hospital readmission rates as a hospital quality metric has been debated as hospitals' post-surgical readmission rates may be more due to patient factors (case mix) compared to hospital factors. It is not known whether a similar trend is present in advanced endoscopic procedures. We therefore sought to evaluate the contribution of individual hospitals on the patient-level probability of readmission after a typical high-risk endoscopic procedure, percutaneous nephrolithotomy (PCNL).

Methods: Using the Nationwide Readmission Database, we identified non-elective 30-day readmissions following PCNL in U.S. hospitals in 2014. Using a multilevel mixed effects model, we estimated the influence of hospital and clinical variables on patients' odds of readmission. A hospital-level random effects term was used to estimate the contribution of unmeasured hospital characteristics on their patients' probability of

MP1-08. Table 1. Baseline characteristics of weighted sample of kidney stones formers undergoing percutaneous nephrolithotomy in the nationwide readmission database from January to November 2014

	Weighted population, %			
	Overall	Readmission		p
	(n=6930) [100%]	No (n=6333) [90.6%]	Yes (n=597) [9.4%]	
Mean age, years	55.6	55.4	57.4	0.073
Sex				0.084
Male	44.0	43.5	50.6	
Female	56.0	56.4	49.4	
Age group				0.09
≤25	2.5	2.5	2.7	
25–34	8.7	8.8	9.2	
35–44	12.5	13.0	7.8	
45–54	20.1	20.3	17.4	
55–64	24.8	24.7	24.7	
65–74	21.8	21.7	23.3	
<75	9.5	9.0	15.0	
Charlson Comorbidity Index				0.236
1	53.8	54.8	45.3	
2	26.8	26.7	28.7	
3	11.3	10.8	15.7	
4	5.1	4.9	8.0	
≥5	2.9	3.0	2.2	
Insurance/Payor				0.002
Private	37.5	38.5	27.4	
Medicare	39.1	38.0	51.4	
Medicaid/Other gov't	15.8	15.8	15.8	
None/Self-pay	3.1	3.2	2.7	
Unknown	4.4	4.6	2.7	
Income quartile*				0.886
1st	25.1	25.0	26.1	
2nd	26.3	26.2	25.3	
3rd	23.8	24.0	22.2	
4th	24.9	24.7	26.3	
Hospital owner				0.124
Government	17.8	17.5	21.4	
Private, non-profit	71.6	71.7	70.9	
Private, investment	10.5	10.8	7.8	
Bed size				0.927
Small	6.5	6.5	6.9	
Medium	24.7	24.8	24.7	
Large	68.7	68.7	68.7	
Hospital surgical Volume (quartiles)**				0.924
1st	13.5	13.6	13.5	
2nd	7.3	7.3	7.3	
3rd	21.9	21.9	21.9	
4th	57.4	57.2	57.4	
Length of stay, days	3.7	3.5	5.2	<0.001
Index hospitalization Cost, $	15 861	15 506	19 630	<0.001

*Quartile classification of the estimated median household income of residents in the patient's ZIP Code. **Mean annual percutaneous nephrolithotomy volume (procedures per year) was 2.6 in bottom quartile, 4.0 in second quartile, 5.93 in third quartile, and 28.9 in the top quartile.

MP1-08. Table 2. Predictors of 30-day readmission in kidney stones formers undergoing percutaneous nephrolithotomy based of multilevel model incorporating hospital-level random effects

	Odds ratio	95% confidence interval
Patient characteristics		
Age	1.01	0.99–1.03
Sex		
Male	Ref	
Female	0.67	0.46–0.98
Charlson Comorbidity Index		
1	Ref	
2	1.14	0.72–1.81
3	1.76	1.01–3.05
4	1.83	0.86–3.90
≥5	0.64	0.15–2.79
Insurance/Payor		
Private	Ref	
Medicare	1.20	0.70–2.08
Medicaid/Other gov't	1.18	0.62–2.29
None/Self-pay	0.61	0.14–2.74
Other/Unknown	2.11	0.65–6.85
Income quartile		
1st	Ref	
2nd	1.02	0.41–2.54
3rd	1.33	0.68–2.61
4th	1.22	0.58–2.28
Hospital characteristics		
Hospital owner		
Government	Ref	
Private, non-profit	0.98	0.59 –1.69
Private, investment	0.78	0.34–1.78
Bed size		
Small	Ref	
Medium	1.20	0.51–2.85
Large	0.88	0.38–2.03
Hospital surgical volume (quartiles)		
1st	Ref	
2nd	1.30	0.87–1.91
3rd	1.09	0.73–1.63
4th	0.95	0.61–1.46
Index hospitalization		
Length of stay	1.00	0.98–1.02
Index hospitalization cost	1.00	1.00–1.00
Month of index hospitalization		
January	Ref	
February	1.17	0.40–3.42
March	1.77	0.66–4.74
April	1.23	0.45–3.40
May	2.13	0.83–5.50
June	1.62	0.60–4.40
July	1.32	0.48–3.66
August	1.15	0.42–3.11
September	1.82	0.68–4.87
October	1.70	0.63–4.58
November	1.68	0.63–4.51

readmission. In order to assess the relative contribution of each group on the predicted probability readmissions, a pseudo R-squared was calculated for predictor variables.
Results: For a weighted sample of 6974 patients who received PCNL at 485 hospitals, the 30-day readmission rate was 8.5% (95% CI 7.4–9.7). In our adjusted model, hospital characteristics, such as surgical volume were not associated with increased likelihood of readmission. Individual hospitals contributed marginally to their patients' probability of readmission. Patient-level characteristics explained far more of the variability in readmissions than hospital characteristics (R-squared 0.53963 vs. 0.00305).
Conclusions: Compared to patient-level characteristics, hospital characteristics contributed minimally to a model predicting patient-level probability of readmission. These findings underscore the potential limitations of 30-day post-discharge readmissions to evaluate hospital quality of care.

MP1-09
Readability metrics of postoperative patient education materials in urology

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Introduction: Prior studies have shown that clearly written patient educational materials increase health literacy, satisfaction with care, and may possibly impact outcomes. The National Institutes of Health (NIH) and various other groups recommend that materials be written near a sixth-grade level for ease of reading and understanding. We examined the readability of handouts for patients undergoing urologic procedures to assess for areas of improvement and hypothesize that urologic oncology handouts are written at a higher grade reading level than others.
Methods: We assessed a total of 121 patient postoperative materials provided by private and academic practices in the United States for readability grade, ease and score, tone, and sentiment. Readability was calculated using commonly used assessment tools, including the Flesch Reading Ease, Flesch-Kincaid Grade Level, Simple Measure of Gobbledygook (SMOG), Gunning Fog index, New Dale-Chall Test, Coleman-Liau index, Automated-Reading Index, Spache Score, Common European Framework of Reference for Languages level (CEFRL), and the International English Language Testing System level.
Results: Postoperative patient handouts were written at an 8th grade reading level on average (range 4.8–11.4). Albany Medical Center institutional handouts were written at 8.6th grade reading level (p=0.03). Average Flesch Reading Ease was 63.8 (8th to 9th grade level of ease). All 121 patient handouts were written with a positive sentiment and 56 (46.3%) handouts were written using predominately male gender. 29 (24%) handouts were written in a conversational manner, while 24 (19.8%) were written in a more formal style. 83 (68.6%) handouts were written at an A1 (beginner level) CEFRL level. Median number of Dale-Chall and Spache difficult words were 234 and 164 respectively per handout.
Conclusions: In general, urologic oncology postoperative handouts tended to be written at a higher reading level (grades 9–10) compared to general urology (grades 5–6), confirming our hypothesis. Our own postoperative handouts were on average written at a statistically higher grade level compared to others. While most general urology post-procedural handouts fell within the ideal target reading level set by NIH and others, there is a clear need for improvement within urologic oncology. Further studies could blind patients to variously written handouts to assess differences in comprehension, satisfaction, and outcomes, such as decreasing service-line calls.

MP1-10

Safety of ureterolysis in the management of retroperitoneal fibrosis

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Introduction: Retroperitoneal fibrosis (RPF) is a rare condition that can progress to extrinsic ureteric obstruction. Conservative management options include pharmacotherapy, placement of ureteric stents, and percutaneous nephrostomy tubes. Definitive management with ureterolysis is typically reserved for patients failing conservative treatment due to perceived perioperative surgical risk. However, current literature on complications is limited to small, single-centered series. In this study we aim to use a large, multicentered database to assess the short-term surgical outcomes of ureterolysis for patients with RPF.

Methods: Using the American College of Surgeons National Quality Improvement Program (NSQIP) database, a retrospective review was conducted on patients who underwent ureterolysis for retroperitoneal fibrosis between January 1, 2006 and December 31, 2016. Only patients who underwent ureterolysis as a principle operative procedure by a urologist were included. Complications within 30 days of surgery were captured in the data set and organized based on the Clavien-Dindo classification system. The frequency of secondary urologic procedures at the time of initial ureterolysis (ureteroureterostomy, ureteroneocystostomy, and ureteroneocystostomy with psoas hitch/bladder flap) was identified.

Results: One hundred patients (51 male, 49 female) were included in the cohort, with a mean age of 57 (IQR 43, 66). Of these patients, 4 underwent a secondary urological procedure at the time of ureoterolysis: 1 ureteroureterostomy, 2 ureteoneocystostomy, and 1 ureteroneocystostomy with psoas hitch/bladder flap. The overall complication rate was 12%, of which almost all were Clavien grade I or II (wound or urinary infection). Only one patient required return to OR (Clavien III) and there were no high-grade complications (Grade IV or V).

Conclusions: To our knowledge, this is the largest study of perioperative complications from ureterolysis in the setting of retroperitoneal fibrosis. The overall complication rate was low and the majority of complications were low grade (clavien grade I or II). Furthermore, the frequency of secondary urologic procedure at the time of ureterolysis was low. As such, ureterolysis, although invasive, likely represents a safe treatment option for ureteric obstruction secondary to RPF.

MP1-11

Hippo Yes associated protein pathway contributes to renal epithelial dysfunction during obstructive uropathy

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Introduction: Despite successes of surgical interventions in relieving ureteral obstructions in children, some fraction of patients develop renal fibrosis and end stage kidney disease. Hippo pathway is a major regulator of organ size and Yes associated protein (YAP) and its paralog, transcriptional coactivator with PDZ-binding motif (TAZ) are the major nuclear effectors of the Hippo signaling. We recently demonstrated that TAZ upregulation consequent to obstructive renal injury contributes to progressive fibrosis. The mechanistic contribution of YAP to kidney fibrosis, however, is not investigated. Here, we test the hypothesis that YAP renal induction in obstructive uropathy promotes fibrotic epithelial dysfunction.

Methods: We used a well-established mouse model of ureteral unilateral obstruction (UUO) to investigate YAP involvement in obstructive nephropathy. Human kidney tubular epithelial cells (HK-2) were stably transduced with either control vector (CMV-Control) or YAP1 (CMV-YAP) expression contracts (driven by CMV promoter via lentiviral transduction). Phenotypic alterations, fibrotic marker expression and growth properties of these transgenic cells were assessed by microscopy, western blot analysis and flow cytometry.

Results: YAP expression is also elevated in the tubulointerstitial regions of the UUO kidneys compared to contralateral controls, correlating with fibrosis. HK-2 cells with stable YAP1 expression (CMV-YAP), which mimics epithelial YAP upregulation during kidney obstruction, underwent epithelial dedifferentiation (marked by loss of epithelial marker E-cadherin expression and acquisition of mesenchymal properties including vimentin upregulation). CMV-Control HK-2 cells, maintained under similar conditions, retained epithelial characteristics including cuboidal appearance and E-Cadherin expression. CMV-YAP cultures also assumed fibrogenic properties (evident by increased fibronectin, collagen-1 expression), underwent G2/M cell cycle arrest and promoted p21 upregulation compared to CMV-control cells.

Conclusions: YAP upregulation promotes epithelial plasticity and growth inhibition, contributing to dysfunctional renal epithelium and fibrotic maladaptive repair. Pharmacological and molecular targeting of YAP upregulation could be a novel and plausible strategy to reduce prevalence of obstructive uropathy.

MP1-12

Examining the appropriateness of new referrals to the urology outpatient clinic of a tertiary care pediatric hospital

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Introduction: Approximately 12 000 patients are seen in our pediatric urology outpatient clinic each year, among 5 full-time faculty. Up to 3500 of these patients are new referrals. Anecdotally, it has been our impression that a large proportion of new referrals were "inappropriate," in that they could have been managed more efficiently by alternative means rather than "in person." In an era of value-based medicine, efforts to improve the triage of patients for maximum patient and provider benefit are imperative. We proposed to assess the clinical appropriateness of referrals to our institution's pediatric urology outpatient clinic.

Methods: Following approval from our institutional Quality Improvement Committee, we administered a survey to non-sequential patients/families newly referred to our clinic to collect demographic information, details regarding the patient's diagnosis, and overall impressions with the clinic visit. A second concurrent survey assessing the appropriateness of each new referral and overall visit satisfaction was administered to physicians and nurse practitioners (NPs) at the same clinic visit. Details regarding the referring physician were obtained from our electronic referral management system (ARMs).

Results: A total of 100 patients/families were recruited over 3 months. Although indicated as new referrals on ARMs, 20% of families reported visiting our outpatient clinic once and 15% reported visiting 2 or more times. Families were more satisfied with their visit than physicians and NPs ($p<0.001$). 39% of referrals were deemed as somewhat or totally inappropriate. The majority of these were referred by family physicians when compared with pediatricians or other referring professionals ($p=0.015$). Premature referrals (15%), spontaneously resolved conditions (10%), and more efficient management at the primary care level (36%) were the most common reasons provided for somewhat or totally inappropriate referrals. Physicians and NPs reported an increase in visit satisfaction with an increase in referral appropriateness ($p<0.001$).

Conclusions: A substantial number of referrals were reported as somewhat or totally inappropriate, where a significantly larger number of these were referred by family physicians. Referral inappropriateness impacts provider satisfaction and potentially affects burnout. Improved understanding of referral appropriateness can help guide interventions that will increase service efficiency without compromising quality of patient care.

MP1-13

Urinary tract infections and duration of ureteric stenting following renal transplantation: Is time our enemy?

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Introduction: Ureteric stenting following renal transplantation is associated with an appreciable risk of developing urinary tract infections (UTI). To date, the optimal timing for stent removal is controversial. The objective of our study was to investigate whether duration of ureteric stenting impacts rate of UTIs, as well as other patient and surgical factors that may put patients at an increased risk of developing UTIs.

Methods: A retrospective observational study was conducted on all renal transplant patients at our institution between June 2011 and December 2015. The primary outcome was the diagnosis of UTI, defined as lower urinary tract symptoms with positive urine culture, within one year postop. These endpoints were stratified based on timing in relation to ureteric stenting: stent in situ, peri-stent removal (<2 weeks after removal), and post-stent removal (>2 weeks after removal). Patient and surgical factors were assessed for association with the primary outcome.

Results: A total of 567 patients were included. The mean age of our cohort was 53.1±1.4 years. Mean duration of stenting was 39.3±13.7 days. 72 patients (13.3%) were diagnosed with UTI. The top three organisms were *E. coli* (43.1%), *Klebsiella* (13.9%), and *Pseudomonas* (8.3%). The majority of UTIs (48.6%) occurred with the stent in situ. Interestingly, the incidence of UTIs peaked between 14 and 28 days of stenting (Fig. 1). In patients who developed UTIs following stent removal, most UTIs presented within 7 days in the peri-stent removal period and within 50 days in the post-stent removal period. UTIs were associated with older age (52.4 vs. 56.4 years; p=0.018), female gender (p<0.001), postop delayed graft function (p=0.031), and longer stent dwell time (38.9 vs. 50.2 days; p=0.004). Older patients were more likely to develop UTIs with the stent in situ (59.1 years in situ vs. 57.9 years peri-stent vs. 51.3 years post-stent; p=0.031).

Conclusions: To our knowledge, this is the largest study comparing duration of ureteric stenting and UTIs. Our results demonstrate that UTI is a common urologic complication following renal transplantation. Older age, female gender, postop delayed graft function, and longer stent duration are risk factors for developing UTIs. We found that UTIs typically present during 14–28 days of stenting and within 7 days following stent removal, so careful followup during these periods may be beneficial.

MP1-14

Renal transplantation outcomes among patients with peritoneal dialysis catheters

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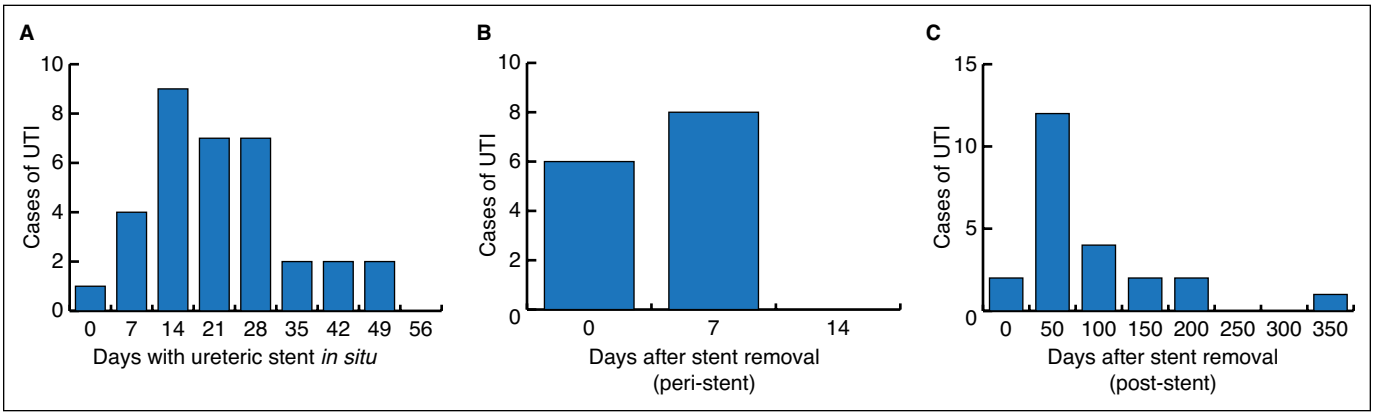
Introduction: Patients on peritoneal dialysis (PD) represent a minority of end-stage renal disease (ESRD) patients and often represent a slightly different demographic group than those on hemodialysis (HD). We sought to compare early outcomes after renal transplantation amongst PD patients vs. those on other modalities of renal replacement. Secondarily, we wanted to examine whether we could predict which patients could safely have their PD catheters removed at the time of transplantation.

Methods: A retrospective observational study was conducted on all renal transplant patients at our institution between June 2011 and December 2015. The primary outcome of interest was the rate of delayed graft function (DGF) and a secondary endpoint was the need for dialysis post-transplant. Patient and surgical factors were assessed for association with the outcomes.

Results: A total of 567 patients were included, of which 111 were on PD at the time of transplantation. The mean age of our PD cohort was 54.3±13.0 years, 53.2% were male, mean BMI was 26.0 kg/m^2, and 30.6% had received a living donor graft (Table 1). Among the PD cohort, DGF was seen in 16.2% (18/111) compared to 27.2% (105/386) in the HD cohort (p=0.0181). Post-transplant dialysis was required in 16.1% of the PD cohort compared to 34.1% in the HD cohort (p=0.0008). 19.4% of PD patients had their catheters removed at the time of transplantation, with the mean post-transplant catheter dwell time being 79.9 days. Patients on PD undergoing renal transplantation were more likely to have DGF if they had a deceased donor graft (p=0.0117) and if the kidney was from a donor after cardiac death (p=0.0102). All 15 PD patients requiring dialysis post-transplant had deceased donor grafts.

Conclusions: Patients on PD prior to renal transplantation seem to have better early post-transplant outcomes compared to HD patients. Only living donor kidney status correlated with the need for post-transplant dialysis, and our study supports the routine removal of PD catheters at the time of living donor renal transplantation.



MP1-13. Fig. 1. Incidence of UTI in patients who developed UTI ***(A)*** with ureteric stent in situ; ***(B)*** in the peri-stent removal period; and ***(C)*** in the post-stent removal period.

MP1-14. Table 1. Patient demographics and postoperative outcomes of renal transplant patients

	PD (n=111)	HD (n=386)	Pre-emptive (n=70)
Age (years)	54.3±13.0	53.5±13.0	48.6±12.3
Gender (% male)	59 (53.2%)	242 (62.7%)	41 (58.6%)
BMI (kg/m²)	26.0±4.4	26.6±5.2	26.8±4.9
Living donor graft (%)	34 (30.6%)	72 (18.7%)	70 (100%)
Delayed graft function (%)	18 (16.2%)	105 (27.2%)	1 (1.4%)
Required dialysis post-transplant (%)	15 (16.1%)	112 (34.1%)	0

PD: peritoneal dialysis; HD: hemodialysis; pre-emptive: no dialysis required.

MP1-15

Comparison of antibiotic prophylaxis regimens prior to transrectal ultrasound-guided prostate biopsies at a tertiary academic Canadian teaching hospital

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Introduction: Antibiotic prophylaxis for transrectal ultrasound (TRUS)-guided prostate biopsies is poorly standardized. The recent increase in fluoroquinolones resistance renewed interest in exploring alternative antibiotic therapies. We performed a retrospective chart analysis of infectious complications in patients who received ciprofloxacin only vs. multiple antibiotics prior to TRUS biopsy at our tertiary academic hospital.

Methods: From January 2013 to December 2015, we performed a retrospective chart review of 753 consecutive men who underwent TRUS biopsy. 72 patients were excluded due to insufficient information. Demographic data, prostate size on TRUS, number of biopsy cores, and complications, particularly post-TRUS infection within 60 days confirmed by urine and/or blood culture, were collected. We compared the infection rates of patients who had ciprofloxacin only (Group 1) vs. multiple antibiotics regimens (Group 2).

Results: 681 patients were included. Median age was 65 years, median prostate volume was 37 mL, and median number of cores was 15. Approximately 55.1% of patients (Group 1: 375/681) were given ciprofloxacin only for prophylaxis. The remaining patients (Group 2: 306/681) were given dual or triple antibiotic therapy. Overall rates of UTI and sepsis within 60 days were 2.35% and 0.59%, respectively. Rates of UTI for Group 1 and Group 2 were 2.40% and 2.29%, respectively (p=0.92). Rates of sepsis for Group 1 and Group 2 were 0.26% and 0.98%, respectively (p=0.23). Overall, 66.7% of patients with bacteriuria and 100% with bacteremia grew organisms resistant to ciprofloxacin. There were no other serious post-biopsy complications.

Conclusions: At our center, rates of post-TRUS biopsy UTI and sepsis in patients receiving ciprofloxacin only compared to multiple antibiotics regimens were not statistically different. Untargeted addition of antibiotics for prophylaxis should be discouraged. Consideration should be given to targeted addition of antibiotics based on local susceptibility profiles or routine rectal swabs to identify at risk individuals for infection.

MP1-16

Enhanced recovery after renal surgery: Initial results

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Introduction: Enhanced Recovery After Surgery (ERAS) protocols are the new topic of interest among various surgical subspecialties. ERAS gives surgeons a dedicated pathway, no matter the surgeon or institution. Though treatment algorithms vary across specialties, the aim is identical: accelerate recovery time, thereby reducing the hospital length of stay. Within urology, ERAS protocols are used with radical cystectomy patients. There is little evidence that looks at the application of ERAS protocol in renal surgery patients. We sought to implement an ERAS protocol in this patient population. The aim of this study is to report initial results

Methods: A retrospective analysis was performed comparing patients who underwent renal prior to and after implementation of ERAS. The ERAS team consists of a multidisciplinary team composed of perioperative nursing staff, anesthesia, and urology teams. In the preoperative period, patients were given detailed instructions and expectations. On the morning of their surgery, they were provided with a standardized set of multimodal antiemetic and analgesic prophylactics, taking weight, GFR, and type of surgery into consideration, and they remained on this pathway until discharge.

Results: There were 76 patients in the pre-ERAS group and 42 in the ERAS group. Median length of stay (LOS) in the pre-ERAS vs ERAS group was 3 vs. 2 days ($p<0.005$). For open procedures, median LOS was 5 vs. 2 days ($p<0.001$). For robotic procedures, median LOS decreased from 3 days to 2 days ($p<0.001$). Median LOS was lower in the ERAS group independent of age, sex, BMI, ASA score, and anesthesia time. Thirty-day readmission rate in the pre-ERAS group was 13.2% and 16.7% in the ERAS group ($p=0.558$). The average total cost per patient decreased from $23 379 pre-ERAS to $16 908 in the ERAS group.

Conclusions: ERAS works well for renal surgery patients. It significantly decreased overall length of stay and hospital cost, without having a significant effect on readmission rate.

MP1-17

Current publication trends in urology literature

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Introduction: Print, online, and open-access journals have steadily increased the overall volume of published material, but it is unclear the affect this has had on the published literature. In this study, we seek to assess the topic, content, study design, and quality of the body of literature published in several major journals in the field of urology.

Methods: All original research articles from the months of January, February, and March from the years 2002, 2005, 2008, 2011, 2014, and 2017 for the Journal of Urology (JU), British Journal of Urology International (BJUI), and European Urology (EU) were assessed for multiple measures of quality and article type. This includes topic; Center for Evidence Based Medicine (CEBM) study type; presence or absence of control, blinding, and randomization; and use of administrative databases. Articles were independently assessed by 2 different reviewers, who were blinded to each other's assessment. A senior researcher then reviewed the collected data for concordance and accuracy of assessment. Trends in the data were assessed both between journals and over time.

Results: A total of 1598 articles were assessed. The most published topics in 2017 were oncology (JU 57%, BJUI 68%, EU 97%) and voiding dysfunction (JU 12%, BJUI 9%, EU 0%). The most common oncology subtopics were prostate cancer (JU 41%, BJUI 40%, EU 59%) and kidney cancer (JU 7%, BJUI 13%, EU 9%). CEBM study types from most to least common were therapy/prevention (JU 36%, BJUI 49%, EU 38%), etiology/harm (JU 25%, BJUI 21%, EU 32%), diagnosis (JU 21%, BJUI 21%, EU 18%), and prognosis (JU 19%, BJUI 9%, EU 12%). Table 1 reports further characteristics of published studies by examined journal.

Conclusions: The most common focus of urologic literature is cancer research. Even in quality urologic journals, markers of high-quality study design (randomization, blinding, control groups) are infrequent. Variability is seen between these journals in the types of studies published.

MP1-17. Table 1

Percentage of articles using	JOU	BJUI	EU
Randomization	7	17	18
Blinding	6	19	12
Control group	25	36	35
Multicenter data	51	40	59
Prospectively collected data	40	51	29
Administrative data	22	9	29

MP1-18

Effects of testosterone enanthate on markers of cardiovascular risk: Results from the STEADY trial

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Introduction: Insulin resistance (IR) often accompanies the onset of male hypogonadism. We studied biomarkers of IR in a population of men with document T deficiency to see if IR was improved with subcutaneous (SC) TRT administered with a single use autoinjector.

Methods: Patients (n=150) were dosed with a self-administered SC weekly 75 mg testosterone enanthate (TE) autoinjector and after 6 weeks received concentration guided (CG) dose adjustment if necessary to maintain T trough levels of 350–650 ng/dL. Pharmacokinetic and clinical laboratory parameters, lipid parameters, and the Quantose IR panel (LGPC, AHB, adiponectin, OAA, insulin, leptin, and IGF-1), and an M score was calculated and safety/tolerability was assessed.

Results: Most patients maintained physiologic TT levels; 98.5% of patients completing at week 12 met the primary endpoint: TT Cavg0-168h between 300–1100 ng/dL at week 12 with the lower bound of the 95% confidence interval ≥65%. Mean TT Cavg0-168h (SD) at week 12 for all patients was 553.3 (127. 3) ng/dL. Mean decreases were observed in serum cholesterol, LDL-C, HDL-C, and triglyceride values (SD) by -17.2 (27.92) mg/dL, -8.0 (23.44) mg/dL, -4.5 (8.57) mg/dL, and -18.8 (140. 4) mg/dL, respectively, across the study period. Quantose M scores and LGPC, AHB, and adiponectin levels increased with time; IR scores and OAA, insulin, leptin, and IGF-1 levels decreased with time; IR scores decreased from baseline to weeks 12, 26, and 52 by 1.4, 4.2, and 4.5, respectively.

Conclusions: Overall, CG TE was safe and well-tolerated. Serum lipds decreased and biomarkers of IR improved with treatment; effects were more pronounced in diabetic/prediabetic subjects. Weekly Ctrough-guided dosing reduced peak and trough fluctuations, and most patients achieved therapeutic exposures. The TE autoinjector is a convenient and viable alternative to T gels and IM injections as treatment for T deficiency.

MP1-19

Results of a 26-week safety study of concentration-guided, subcutaneous, self-administered testosterone enanthate auto injector in adult males with testosterone deficiency (TD)

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Introduction: Few of the available testosterone (T) therapies are convenient to use. The subcutaneous testosterone enanthate autoinjector (SCTE-AI) allows patients to self-administer testosterone enanthate (TE) as a single, once-weekly dose. SCTE-AI has been shown to be efficacious, safe, and well-tolerated. This safety study in adult males with testosterone deficiency (TD) was conducted to confirm the safety of SCTE-AI.

Methods: This was a dose-blinded, single-arm, multiple-dose, 26-week registration safety study to assess SCTE-AI 75 mg administered once weekly to adult males with TD. After week 6, SCTE-AI doses were adjusted as needed to maintain T trough of 300-650 ng/dL. The primary objective was to assess the safety of SCTE-AI, and the secondary objective was to characterize the pharmacokinetic (PK) profile for TE for select patients receiving 75 mg SCTE-AI through week 12. Standard safety plus 24-hour ambulatory blood pressure (BP) monitoring data were collected.

Results: In total, 133 patients received SCTE-AI treatment at 19 sites in the U.S. Mean PK concentrations of T, TE, dihydrotestosterone, and estrogen all increased from predose week 1 to week 12. T trough was 300-650 ng/dL in 82. 4% of patients at week 12 and 83. 2% at week 26. Compliance was >99%. Pain was experienced during only 1 (0. 1%) of the 965 injections. By week 26, mean systolic BP and diastolic BP increased slightly, from 125.6 and 78.2 mmHg at baseline to 129.0 and 80.0 mmHg, respectively. A week 12 ambulatory BP study showed -24-hour mean systolic BP and diastolic BP increased 3.7 mmHg and 1.3 mmHg from baseline, respectively. Reductions in blood lipids included total cholesterol, low-density lipoprotein, and high-density lipoprotein cholesterol, from 185.3, 112.6, and 43.3 mg/dL at baseline to 171.8, 103.7, and 38.3 mg/dL at week 26, respectively. In total, 34 (25. 6%) patients experienced adverse drug reactions (ADRs). The majority of ADRs were mild or moderate. The most frequent ADRs were increased hematocrit (10 [7.5%] patients), injection site hemorrhage (6 [4.5%] patients), injection site bruising (4 [3.0%] patients), and increased prostate-specific antigen (4 [3.0%] patients).

Conclusions: SCTE-AI has a favorable safety profile and is well tolerated, with a stable PK profile. BP measurements were consistent, whether assessed during scheduled visits or via 24-hour ABPM. Patients using SCTE-AI were highly compliant, successfully self-administering TE weekly with few injection site reactions.

MP1-20

Interprofessional teleurology care in rural Northern Ontario: Lessons from patients and relatives

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Introduction: Since we adopted telemedicine, interprofessional collaborative care has been encouraged. The patient, relatives, primary care provider and the specialist all meet at the point of care by telemedicine. When possible, learners attend. By January 2015, we attempted to determine how the patients and their relatives perceived this pattern of care.

Methods: Approval was received from the Ethics and Review Boards of the rural hospitals. Data were collected by paper questionnaire. Informed consent was obtained from participants. Diagnosis, treatment, and number of telemedicine encounters and outcomes were recorded. Information regarding computer and internet use among the patients' relatives was also obtained. Quantitative and qualitative data were analysed using the Statistical Analysis Software (SAS) and conceptual matrix respectively.

Results: 124 patients have completed the survey — 74 men and 48 women aged between 31 and 92 (average 64) years. Cancer diagnoses and the elderly with multiple comorbid conditions were predominant. Spouses comprised 90% of all accompanying relatives. There were 8 primary healthcare providers/care givers. Patients and relatives were satisfied with the care provided, with timely access nearer to home, cost savings, and minimal travel time, especially during the winter.

Conclusions: This study suggests that patients and their relatives value telemedicine assessment because it helps to minimize travel, reduces cost and time off work, and provides appropriate care. Further experience with this pattern of care and its ramifications is required. Visits to physicians' offices for minor assessments may soon become virtual in time and space.

MP1-21

Learner-faculty feedback and reflective practice in a rural urology clinic

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Introduction: Learners from several health institutions spend some time in our rural urology practice to gain experience. Over the years, we have adopted various methods of feedback to enrich our teaching and clinical practice. We report one such method that seems to resonate with the learners.

Methods: Our learners are residents and medical students from NOSM and other medical and nursing schools who elect to spend blocks of time to gain urological knowledge. On arrival, the learner meets the faculty and unit staff and discusses the learning contract or plan, setting some simple, achievable goals. The learner works alongside faculty. In one strategy, the learner selects 2 or 3 topics/cases for in-depth review and literature search. The learner reflects on the day's activities, workplace and professionalism, produces a report after critical analysis and literature review. This is submitted electronically to faculty, who review the work and provide feedback, sometimes resulting in multiple loops of dialogue.

Results: Learners were very receptive, with close to 90% compliance rate. Knowledge gained led to change in practice and attitude, as well as skill acquisition. Reflective practice, critical analysis, development of professionalism, and publication of case reports were positive outcomes of this feedback process.

Conclusions: Learner-faculty feedback is a healthy strategy for professional healthcare education. Benefits to learner and faculty include growth and sustainable workplace relations. Respectful, honest, genuine feedback generates confidence and trust. Even negative feedback, taken seriously, can result in lasting benefits.

Moderated Poster Session 2: Pediatrics and Trauma

Moderators: Douglas A. Canning, MD, Children's Hospital of Philadelphia; Jeanne O'Brien, MD, Department of Urology, University of Rochester

MP2-01

Testicular microlithiasis and testicular cancer in a young cohort: When the disease shows up first…the diagnostic value of a possible indicator of malignancy remains questionable…

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Introduction: We sought to determine the prevalence of testicular microlithiasis among pediatric patients who underwent surgery for the removal of a testicular tumor.

Methods: Testicular tumors can represent a life-threatening condition. Hence, known risk factors of developing a testicular malignancy may influence followup strategies to reduce morbidity and mortality. Association between testicular microlithiasis (defined as a cluster of more than 5 hyperechogenic foci per field) and testicular cancer has been discussed for many years with doubtful conclusions, but recent publications strongly favored following patients, stating that there was indeed an increased risk of malignancy if patients were found to have testicular microlithiasis. Nonetheless, it seems that patients treated for testicular cancers are, in everyday life, rarely diagnosed incidentally during a planned followup ultrasound.

Results: All the records of patients whom underwent a testicular procedure at our pediatric tertiary care center between 1997 and 2017 have been retrospectively reviewed. A total of 1256 charts were identified, of which 1255 were available for review. A total of 48 patients were found to have a testicular or paratesticular tumor, of which 22 were malignant (14 non-seminomatous germ cell tumors, 3 granulosa cell tumors of the testis, 3 rhabdomyosarcomas, and 2 others). All patients found to have a malignant tumor have undergone ipsilateral radical orchiectomy with or without other treatment modalities depending on the initial pathology. Patients who presented with a malignant tumor were aged between 6 days and 17 years old (mean 9.24 years). None of the patients were diagnosed while being followed with repeated ultrasounds because of previously identified testicular microlithiasis. There were, however, 4 patients (18% of the patients found to have malignancy) who presented with concomitant testicular microlithiasis in the contralateral testis (2 patients) or on both sides (2 patients). All patients had testicular microlithiasis at the time of the diagnosis and none others were found to develop testicular microlithiasis during the followup period.

Conclusions: In our small retrospective study, patients found to have a malignant testicular tumor had an increased risk of having testicular microlithiasis compared to the general population but possibly less than in other groups found to have abnormal genitalia for instance. Moreover, knowing about it, did not appear to change anything with regards to subsequent diagnosis.

MP2-02

Randomized control trial of transcutaneous stimulation of peripheral tibial nerve vs. hand stimulation in children with nocturnal enuresis

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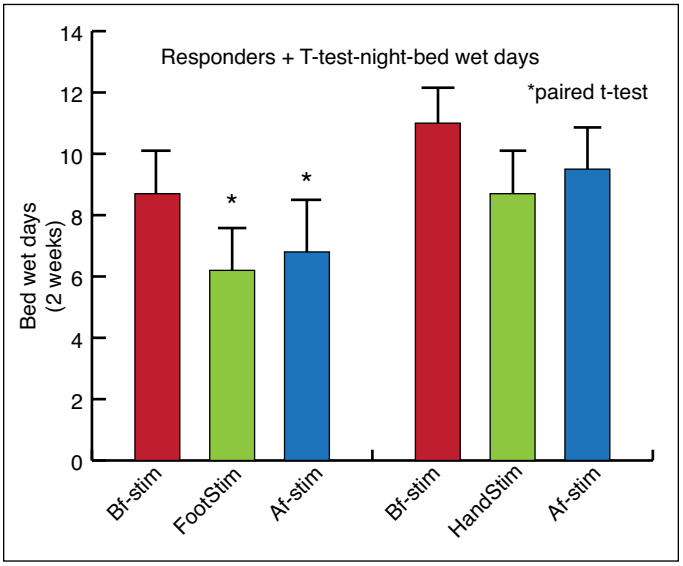
Introduction: It is estimated that nocturnal enuresis (bedwetting) affects 13–20% of 5-year-olds, 10% of 7-year-olds, 5% of 10-year-olds, and 1% of 15-year-olds in America. Currently, limited therapies are available, which are mainly targeted towards education and alerting the child. Previously, we have shown that there was a significant reduction of wet nights during and after stimulation of the peripheral tibial nerve branches. This is a randomized control study to evaluate minimally invasive stimulation of the foot (peripheral tibial nerve branches) vs. stimulation of the hand (thenar eminence).

Methods: Our study included cchildren aged 5–18 years with 2 or more bedwetting episodes a week for 1 month. The study lasted a total of 6 weeks: the first 2 weeks were a baseline nighttime voiding diary, then 2 weeks of either foot or hand stimulation for at least 60 minutes each night, then 2 weeks post-stimulation. During the stimulation period and the following two weeks post-stimulation, participants also completed a nighttime voiding diary.

Results: 27 patients were recruited; 14 children were assigned to the foot stimulation, while 13 were assigned to the hand stimulation. One patient (in the hand group) did not complete any of the voiding diaries and thus did not have any data. The average age of the patients was 12.1 years for



MP2-02. Fig. 1.

the foot group (range 8–17) and 12 years (range 8–17) for the hand group. Responders were defined as having a decrease in 1 or more wet nights during stimulation. 9 of 14 (64%) of the foot stimulation were responders, while 8 of 12 (67%) of the hand stimulation group were responders. Of the responders in the foot stimulation group, there was a significant reduction in mean total wet nights from 8.78±4.12 to 6.22±4.21 during the stimulation (p=0.0156) and a sustained significant reduction to 6.78±5.19 (p=0.04). Of the responders in the hand stimulation group, there was an average of 11 wet nights ±3.46, which decreased to 8.75±3.99 during stimulation (p=0.07) and 9.5±3.82 after stimulation (p=0.19). There were no adverse events during the study.
Conclusions: This randomized study shows that transcutaneous stimulation of the peripheral tibial nerve may be a non-invasive, at-home treatment to decrease the number of wet nights in children with nocturnal enuresis.

MP2-03
The effect of oral steroids on postoperative complications in proximal hypospadias repair: A prospective, randomized, placebo-controlled study

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Introduction: Proximal hypospadias is a complicated diagnosis, with the treatment being equally problematic. Complication rates for proximal hypospadias repairs reach as high as 50% in the literature. Here, we present preliminary data on a novel therapy to attempt to reduce complications and improve wound healing in proximal hypospadias repair.
Methods: We obtained IRB approval and designed a randomized, double-blind, placebo-controlled trial. Patients with proximal hypospadias (proximal shaft, penoscrotal, or scrotal) undergoing single-stage or staged repairs were prospectively enrolled after obtaining informed consent. Patients received either methylprednisolone (1.5 mg/kg/day divided in two doses) or placebo for 5 days postoperatively. Urethral stents were kept for 7–10 days postoperatively. Patients had scheduled followup at 6 weeks, 6 months, and annually thereafter. Primary outcome was postoperative complication rate, while secondary outcomes included compliance with and safety of medication.
Results: 22 patients were prospectively enrolled in the study. 14 patients (64%) were penoscrotal, 6 (27%) were proximal shaft, and 2 (9%) were scrotal. 18 patients (82%) underwent single stage repairs, while 4 patients (18%) underwent staged repairs. Median age at surgery was 8.5 months (IQR 7.2–11.2). 13 patients (60%) were in the prednisone arm and 9 patients (40%) in the placebo arm. There was 1 complication in the prednisone group (8%) and 2 complications in the placebo group (24%) (p=0.5), for a total complication rate of 14% among both cohorts. Complications were noted as early as 10 days and up to 6 weeks postoperatively and included one glans dehiscence and 2 urethrocutaneous fistulae. The patient with the complication in the prednisone arm also had early dislodgement of urethral catheter. There was a 95% compliance rate with medication; 1 patient only completed 9/10 doses. There were no adverse events with the medication.
Conclusions: This is the first randomized, placebo-controlled trial evaluating the effect of postoperative steroids on proximal hypospadias repair. While the results do not reach significance, we had a low overall complication rate, with only one complication rate in the prednisone arm. There were no adverse events from the medication and all patients tolerated it well. We plan to continue enrolling patients and look to long-term followup to better assess the outcomes.

MP2-04
Robotic ureteropyelostomy for a lower pole ureteropelvic junction obstruction in a partially duplicated kidney

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Introduction: We would like to take this opportunity to present a video of our technique performing a laparoscopic robot-assisted ureteropyelostomy for a lower pole ureteropelvic junction obstruction in a partially duplicated kidney. The patient is a 15-year-old with Turner's syndrome and refractory hypertension. She was found to have a right hydronephrotic kidney on renal ultrasound. Additional workup revealed delayed drainage in a possibly duplicated system.
Methods: We have a da Vinci SI at our institution. The patient was positioned, prepped, and draped in the usual fashion. On initial survey, she appeared to have a hydronephrotic, extrarenal pelvis in a malrotated kidney, as well as a set of lower pole vessels. Due to her favorable body habitus, the ureter was easily visualized overlying the dilated pelvis distal to her UPJ. Dissection was carefully carried proximally in the usual fashion and it became obvious that she had an incomplete duplication, with the point of obstruction at the lower pole ureteropelvic junction. The decision to proceed with an Anderson-Hynes dismembered pyeloplasty was made. However, after dismembering and spatulating the lower pole ureter, we felt that there was still too significant a degree of intrinsic narrowing to continue in this manner. After re-examining her anatomy, we proceeded with an upper to lower pole ureteropyelostomy by anastomosing the upper pole ureter to the lower pole renal pelvis in a side to end fashion. Method of stent placement is by attending preference and so after completing approximately 2/3 of the repair, a JJ stent was placed in an antegrade fashion. The repair was then satisfactorily completed with 5-0 vicryl suture in a watertight fashion.
Results: Immediately postoperatively she was able to reduce her antihypertensives in half. She has since undergone cystoscopy and stent removal. She continues to do well without any complications.
Conclusions: Incidental hydronephrosis resulting from a lower pole ureteropelvic junction obstruction that was incidentally discovered during workup of refractory hypertension was successfully managed with a robot-assisted laparoscopic upper pole ureter to lower pole renal pelvis ureteropyleostomy. Relieving the obstruction has enabled the patient to greatly reduce her antihypertensives with no complications.

MP2-05
Delayed presentation of posterior urethral valves

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Introduction: Posterior urethral valves (PUV) are the most common cause of congenital lower urinary tract obstruction. Even with early treatment in the newborn period, children experience long-term effects. Historically, approximately 10% of patients have presented with a delayed diagnosis of posterior urethral valves. We reviewed our cohort of patients with a diagnosis of PUV to assess patients with a late presentation.
Methods: In accordance with institutional review board approval, we performed a retrospective review of all patients seen in the pediatric urology clinic with a diagnosis of PUV between 1988 and 2017. Patient charts were then reviewed and classified by the age of diagnosis. Late presentation was defined as an age at diagnosis of 6 months or greater. The clinical characteristics of these patients were analyzed and compared with patients with an antenatal or immediate postnatal diagnosis of PUV.
Results: 32% of the patients were delayed presentation of PUV. When compared with patients diagnosed prior to 6 months, these patients were noted to have a lower peak creatinine (0.5 vs. 1.35, p<0.01). The delayed presentation patients were also less likely to have a postoperative VCUG or require a vesicostomy. While a higher percentage of delayed presentation patients underwent repeat ablation (12% vs. 6%), this was not statistically significant. The majority of patients in both groups were noted with type 1 PUV, but there were more (18 vs. 3) Type 3 PUV noted in the early diagnosis group. No patients in the delayed presentation group underwent a transplant within the followup period.

MP2-05. Table 1. Overall demographics

	(n=150)
Race	
White	111
Black	23
Other	16
Vesicostomy (n=150)	11%
Age at diagnosis (n=136)	24 (0.03–216)
Age at ablation (n=133)	27 (0.03–216)
Follow-up (n=133)	45 (0–192)
Valve type (n=150)	
Unknown	51
1	76
2	2
3	21
Postop VCUG (n=150)	44%
Peak Cr (n=89)	1.6 (0.2–5.2)
Nadir Cr (n=95)	0.5 (0.1–2.5)
Antenatal intervention (n=150)	2%
Repeat ablation (n=150)	9%

MP2-05. Table 2. Late vs. early diagnosis

	Early (n=82)	Late (n=68)	p
Race			
White	61	50	
Black	13	10	
Other	8	8	
Vesicostomy	18%	3%	<0.01**
Mean age at diagnosis (range)	0.5 (0.03–4)	61 (6–216)	
Mean age at ablation (range)	4.5 (0.03–144)	61 (6–216)	
Mean followup	50	38	
Valve type			
Unknown	21	30	
1	41	35	
2	2	0	
3	18	3	
Postop VCUG	55%	31%	<0.01**
Median peak Cr	1.35	0.50	0.02*
Median nadir Cr	0.30	0.40	0.33*
Antenatal intervention	4%	0%	0.11*
Repeat ablation	6%	12%	0.22*

*p calculated using Wilcoxon rank-sum test. **p calculated using Fisher's exact test.

Conclusions: Our results demonstrate a larger percentage of patients with delayed presentation of PUV. These patients appear to have a less severe form given their lower peak Cr at time of diagnosis, as well as the fact that none of the patients has required a renal transplant. Longer-term followup will be needed to assess the continued renal function in both groups.

MP2-06

Does timeliness to appointments affect treatment outcome in children with bladder and bowel dysfunction?

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Introduction: Recent literature has suggested that children with bladder and bowel dysfunction (BBD) living in less favorable environments are more likely to experience severe dysfunction. In parallel, a study of over 1700 children demonstrated that missing appointments correlates with poorer diabetes control. Initial treatment of BBD is dependent on family adherence to a behavioral regimen. Thus, we hypothesized that families who were late to their initial pediatric urology appointment for BBD would have a worse response to treatment.

Methods: We retrospectively reviewed the charts of all patients with BBD diagnoses seen at our pediatric urology clinic between January 1, 2017 and January 1, 2018. At our institution, all patients seen for BBD are asked to complete the Vancouver Symptom Score (VSS), a validated questionnaire, at their arrival to each visit. Patients were excluded if they did not complete an initial and followup VSS, had a concurrent neuropsychiatric disorder, or were not initiated on a standard regimen of behavioral, dietary, and bowel management. Patients were defined as on time if their check in time was before or equal to their appointment time and late if their check in time was after their appointment time.

Results: A total of 146 patients met study criteria, 50 (34%) of which arrived late to their appointment. 72% of patients were female and age ranged from 4–18 years. BMI was recorded for 58% of patients with an average of 18.4 kg/m^2. Mean arrival time difference was -16.3 minutes for on-time patients and +12.8 minutes for late patients. The mean initial VSS was similar between groups at 18.0 for on-time patients and 18.6 for late patients (p=0.64). Mean symptom improvement, the difference in initial VSS to first followup VSS, was 3.71 for on-time patients and 3.64 for late patients (p=0.95). Pearson correlation coefficients were calculated for arrival time difference vs. initial VSS and vs. symptom improvement difference, with values of -0.09 and -0.07, respectively, which demonstrate poor correlations.

Conclusions: Based on these results, children with BBD who were late to their initial appointment had equal improvement with standard behavioral, dietary, and bowel management vs. those who were on time to their initial appointment, which was contrary to our hypothesis. In addition, there was no significant difference in initial BBD severity based on appointment timeliness. These findings show no evidence that poor timeliness to initial appointment is a negative predictive factor for children with BBD.

MP2-07

Renal undifferentiated round cell sarcoma: CCSK in disguise?

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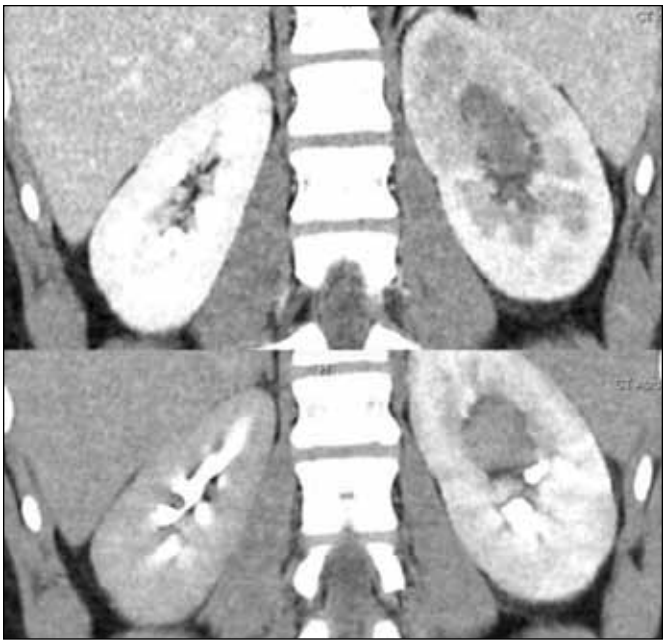
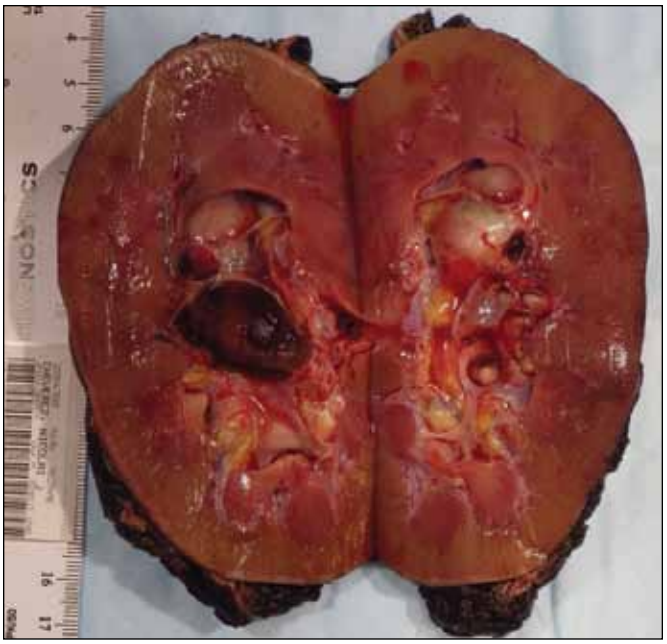
Introduction: A 14-year-old male with history of seizure disorder presents with gross hematuria and left flank pain. Denies preceding trauma, fever, or symptoms of UTI. Parents deny family history of genitourinary malignancies. The patient initially presented to an outside hospital, where MRI showed a left renal lesion. Serum labs normal. Urine culture and cytology negative. CT torso showed left hydronephrosis, a 21 mm enhancing structure projecting into an upper pole calyx (Fig. 1), and no evidence of metastasis. Left nephrectomy (Fig. 2) was performed with preliminary pathology revealing a malignant spindle cell neoplasm. Outside consultation from COG reference pathologist identified the lesion as an undifferentiated round cell sarcoma, with BCOR-CCNB3 fusion transcript detected.

Methods: A literature review of undifferentiated round cell sarcomas and BCOR-CCNB3 fusion variants was performed.

Results: Undifferentiated round cell sarcomas represent a distinct group of small round cell sarcomas. 10% harbor BCOR-CCNB3 fusions or other rearrangements. Prognosis and optimal treatment strategies are not yet clearly defined. The BCOR-CCNB3 fusion variant affects primarily male 6–18 years old, typically involving long bones, spine, and pelvis, although



MP2-07. Fig. 1.



MP2-07. Fig. 2.

20% involve soft tissue. The first 2 cases of primary renal lesions found to have BCOR-CCNB3 fusion were described in the literature earlier this year. The patients were both males, ages 11 and 12 years. Both underwent radical nephrectomy. Followup on the 11-year-old is unknown. The 12-year-old experienced recurrence as a spindle cell sarcoma in the abdomen 15 months later. Renal clear cell sarcoma-based chemotherapy regimens based on doxorubicin are recommended.
Conclusions: Renal undifferentiated round cell sarcomas overlap with clear cell renal sarcoma on age of presentation, genetic markers, and immunohistochemical characteristics. More research is needed to fully elucidate their true identity.

MP2-08
Expanded applicability of refluxing pyelo/ureterovesicostomy for primary and salvage definitive reconstruction in pediatric urology

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Introduction: Vesicoureteral reflux (VUR) fostered the field of pediatric urology. As its natural history has been better understood, VUR in most instances is a bystander, not a primary problem. In selected events of renal obstruction due to a congenital or acquired problem, converting an obstructed system into one with VUR may be a beneficial trade. Herein, we reviewed our experience of ureterovesicostomy (UV) as a salvage procedure, and pyelovesicostomy (PV) as a primary procedure, in infants and children.
Methods: All patients in our database who underwent UV as a salvage operation and PV as a definitive primary procedure between 2011 and 2018 were analyzed. Exclusion criteria were those who had UV performed as a primary repair.
Results: Two children underwent each of UV and PV, respectively. One underwent UV bilaterally at 9 years of age, who previously underwent ureterocelctomy and bilateral reimplants performed early in life, which became obstructed, becoming nephrostomy dependent. All 3 remaining patients had surgery performed at <3 months of age, 2 left sided and one right. Of these, 2 presented with "giant hydronephrosis" due to ureteropelvic junction obstruction with inadequate ureteral diameter to allow safe pyeloplasty and had PVs performed. The final infant had a solitary dysplastic kidney with chronic kidney disease with an ectopic ureteral inserting at the bladder neck, which was both obstructing and refluxing. He had become uroseptic, leaving him with a nephrostomy. Refluxing UV was performed rather than cutaneous ureterostomy in order to maximize bladder cycling in anticipation of eventual transplant. All 3 infants were ready for discharge later that day, but policy required an overnight stay due to age. The older patient was discharged on the fourth postoperative day. All patients have been followed for >3 months with no complications and improved hydronephrosis; no future anti-reflux surgery is anticipated.
Conclusions: Although VUR historically has been an entity where surgical correction has been the norm, management is now more controversial, where medical management and surveillance have become the standards and invasive correction less common. Less than decade ago, it would have been heresy to consider creating VUR. However, trading obstruction with the ongoing risk to the remaining nephrons for the option of VUR needs to be considered in selected scenarios. Refluxing UV and PV are potential definitive alternatives in patients with complex scenarios, with few short-term risks. Long-term followup is mandatory to assure that these results are sustainable.

MP2-09
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," a 6-week pilot model during which a selected team of core surgeons, anesthesiologists, and nursing staff committed to shorter turnover times and increased number of cases per day, was tested compared to historic controls. Patients included were low-risk (ASA 1–2) outpatient, inguinal-genital surgeries that were anticipated to take less than 1 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 year's OR activity logs who had undergone the same surgery by the same surgeon.
Results: In total, 33 pediatric urology patients, managed by 2 surgeons, were evaluated over the 6-week period. The mean case length time was significantly shorter for "Fastlane" patients (47 minutes vs. 68 minutes for the control group; p<0.00014). Mean induction time was shorter in "Fastlane" (17 minutes vs. 21 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 minutes vs. 26 minutes, respectively (p=0.0008; SD=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.

MP2-10

Comparison of non-operative and operative management — our experience with penetrating and blunt renal injuries

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Introduction: Insufficient data exists that compares the outcomes of non-operative management with open renal exploration after blunt and penetrating renal injuries. To avoid unnecessary renal exploration and nephrectomy in patients having penetrating and blunt renal injuries, a comparative analysis is done. The objectives of our study are to 1) conduct a systemic review, if non-operative management is the first-line option for high-grade renal trauma in terms of safety and effectiveness; 2) determine the optimum method of management in blunt and penetrating renal trauma; and 3) determine whether all grades of hemodynamically stable injuries can be managed conservatively.
Methods: We did retrospective study from January 1, 2014 to December 31, 2017 in a tertiary care hospital. All the patients who had either blunt or penetrating renal trauma were analyzed. Data collected from medical records included demographics, mechanism of injury, severity, management, investigation findings, and followup complications. We used means for continuous variables and t-test for comparison, while X-square test was used to compare categorical variables.
Results: In our retrospective study, 86 patients were included; 56 (65%) had blunt renal trauma, while 30 (35%) had penetrating renal injuries. Surgical intervention was done in 24 patients (28%), 16 had grade V injuries, while 8 had grade IV injuries. Renorraphy was done in 14, partial nephrectomy in 4, and nephrectomy in 6. Followup showed good renal function, but hypertension was seen in 2. The non-operative group included 62 patients (72%); 44 had grade III injuries, 16 had grade IV, and 2 had grade V injuries. Outcome in non-operative group was excellent in 52, with no complications. Complications among 8 patients were renal atrophy, persistent subcapsular collection, and recurrent hematuria. 2 died of associated injuries.
Conclusions: Non-operative management in renal injury is safe and effective in a stable patient and it also has higher renal preservation rate. Renal injury grade V, associated abdominal injuries, and penetrating injuries predict for conservative management failure. Selective non-operative management has low morbidity and mortality rate and complication rate was also not higher than those who were explored surgically.

MP2-11

Refractory urinary and fecal incontinence in children: An assessment of needs

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Introduction: Urinary and fecal incontinence (UI, FI) are common problems affecting both adults and children. Approximately 1% of children do not respond to standard pharmacologic and behavioral therapies, with surgery frequently being left as the only option. Recent efforts, however, indicate that transcutaneous electrical stimulation (TENS) and sacral neuromodulation (SNS) therapies are viable treatments for UI and FI. A better understanding of the physical and psychological burden of FI and UI for patients and their primary caregivers can help optimize treatment and lead to better treatment outcomes. In this study, we investigated the specific challenges faced by children suffering from UI and FI, assessed the challenges faced by their caregivers, and examined attitudes toward treatment alternatives (i.e., TENS and SNS).
Methods: A sample of families with patients who were 6–17 years of age and presenting with a history of non-neurogenic refractory UI and/or FI was recruited from our institution's pediatric urology outpatient clinic. Dysfunctional voiding severity and stool consistency were assessed using the Dysfunctional Voiding Scoring System (DVSS) and Bristol Stool Chart (BSC), respectively. Both patients and their primary caregivers completed a continence-specific pediatric quality of life questionnaire (PinQ), where a higher score indicated a more significant impact of incontinence on quality of life, and answered a set of questions pertaining to the burden of their condition and their attitudes toward TENS or SNS therapies.
Results: A total of 14 patients (11 females and 3 males, mean age of 9±3 years) and their caregivers were recruited over a period of 2 months. Mean DVSS and BSC scores were 9 (IQR 7–13) and 3 (IQR 2–3), respectively. PinQ scores were higher for primary caregivers compared to patients (p=0.04). Mean DVSS score was moderately correlated with mean parental PinQ score (rho=0.45; p=0.1). When asked what it is like to have a child with bladder and/or bowel issues, most parents expressed frustration, worriedness, and referred to the situation as a source of heightened stress. 43% of primary caregivers were open to trying TENS therapy for their child, whereas 37% were open to trying SNS therapy. 21% were unsure about either therapy or would require more information.
Conclusions: Our preliminary data suggests that UI and/or FI present a higher burden to parents than patients. This may be explained by the younger age of the cohort. Since a large portion of parents of children with refractory incontinence are willing to try SNS or TENS therapies as an alternative treatment, efforts should be made to have these therapies available for this population.

MP2-12

Assessment of risk factors for surgical complications in neonatal circumcision clinic

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Introduction: 30% of male newborns are circumcised annually in Canada. Circumcision, however, carries risks, as well as potential benefits. 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), return to

MP2-12. Table 1. Characteristics of patients with bleeding requiring sutures

Characteristics	Patients with bleeding requiring sutures (n=18) n (%), mean (SD)	Patients without bleeding requiring sutures (n=259) n (%), mean (SD)	p	Odds ratio (95% CI)
Age >52 days	5 (27.8)	29 (11.2)	0.561	1.486 (0.391–5.640)
Weight >5.1 kg	8 (44.4)	36 (13.9)	0.020	4.145 (1.246–13.799)
Medically indicated	3 (16.7)	16 (6.2)	0.756	1.333 (0.218–8.152)
Comorbidity	5 (27.8)	29 (11.3)	0.127	2.990 (0.732–12.221)
Mogen clamp	9 (50.0)	161 (62.2)	0.258	0.558 (0.203–1.535)

MP2-12. Table 2. Characteristics of patients with long-term complications

Characteristics	Patients with long-term complications (n=26) n (%), mean (SD)	Patients without long-term complications (n=251) n (%), mean (SD)	p	Odds ratio (95% CI)
Age >52 days	5 (19.2)	29 (11.6)	0.879	0.911 (0.272–3.044)
Weight >5.1 kg	9 (34.6)	35 (13.9)	0.011*	3.738 (1.356–10.306)
Medically indicated	1 (3.8)	18 (7.2)	0.435	0.398 (0.039–4.020)
Comorbidity	2 (7.7)	32 (12.7)	0.689	0.714 (0.136–3.735)
Mogen clamp	19 (73.1)	151 (60.2)	0.140	2.007 (0.796–5.057)

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. 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. 26 patients (9.4%) experienced long-term complications, with most being penile adhesions (84.6%). One of these patients required surgical intervention. 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 1, 2).
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.

MP2-13

Tertiary center variability among Canadian pediatric urologists and pediatric surgeons in inguinal hernia repair

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Introduction: Inguinal hernia is a common pediatric condition that is surgically managed by both pediatric urologists (U) and pediatric surgeons (S). It is well-established that surgeons' training, values, and preferences, that is "experience-based medicine," can often influence practice. Moreover, as quality is related to expenditures or overall value, it becomes a primary driver in medical care. It is becoming increasingly important to standardize approaches to certain conditions when possible and practical. In this study, we aim to standardize care and optimize the use of medical resources by ascertaining the value of sending a hernia sac routinely to pathology and the necessity of a postoperative (postop) clinic visit.
Methods: Following approval from our institutional Quality Improvement Committee, a retrospective chart review of patients who underwent inguinal hernia repair at our tertiary care pediatric center between January 2015 and January 2018 was performed. The following patient information was collected: gender, age at first consultation and surgery, number of hernia sacs submitted for pathological examination and their histological findings, postop care, perioperative (periop) complications, and postop emergency room (ER) visits.
Results: A total of 1074 patients were identified; 86% and 14% were managed by S and U, respectively. Younger patients ($p<0.001$) and more girls ($p=0.005$) were seen by S than U. A significant variability was noted in pathological evaluation of hernia sacs. More patients operated by S underwent pathological analysis than those by U (44% vs. 2%; $p<0.001$). Of 488 specimens evaluated, 97% were normal. No malignancy was detected and other findings did not change clinical management. Following repair, more patients operated by U had postop followups than those by S (48% vs. 32%; $p<0.001$), while more patients operated by S were directly discharged to family doctors and pediatricians postop (38% vs. 7%; $p<0.001$). Minimal periop complication rates (2%) or postop ER visits (4%) were observed, with no significant differences in patients operated by U and S ($p=0.11$ and $p=0.65$, respectively).
Conclusions: There are differences in the management of inguinal hernias between pediatric urologists and pediatric surgeons, specifically in the rate of submission for pathological evaluation and postoperative management, despite predominantly non-significant histological findings and high success rates with pediatric hernia repair. Subsequent cost analysis may help with implementing a cost-effective strategy that promotes Choosing Wisely Canada and provide the standardized care for patients.

MP2-14

A bibliometric analysis of pediatric renal transplantation literature

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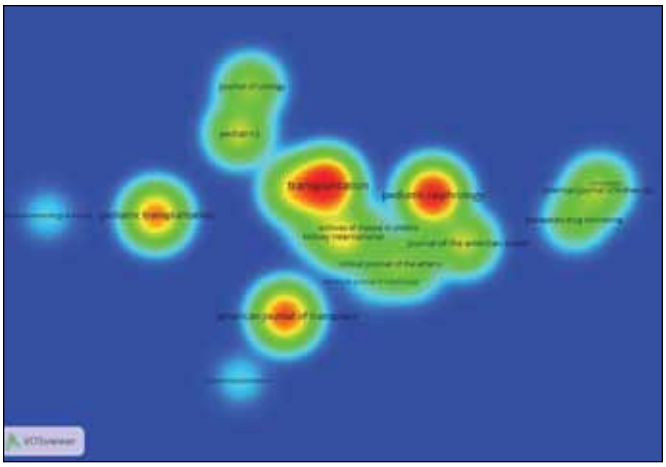
Introduction: Pediatric renal transplantation (PRT) has been a heavily published topic since the 1950s. Herein, we describe the bibliometrics of the 200 most cited manuscripts with an evaluation of the impact of these publications and analysis using the recently described impact index.
Methods: Using Web of Science, we identified the top cited PRT publications from 1900–2018. Year of publication, times cited, h index, country of origin, journal impact factor, manuscript impact index, topic, and



MP2-14. Fig. 1.

study design were extracted by 3 clinicians. Calculation of the "impact index" was conducted as previously described, adjusting for times cited by time since publication to determine the individual impact of each paper. VosViewer version 1.6.5 was used for citation analysis and mapping.
Results: The 200 papers were published in 30 journals from 1976–2013. Citation count was 80±40, impact factor 3.9±3.7, h index 35±20, and impact index 25±13. Studies were most frequently retrospective (31%) or observational (32%). Most papers originated from the US (58%), Germany(9%), and Italy(6%), but this did not correlate with citation counts. *Transplantation* (18%), *Pediatric Nephrology* (16%), and *American Journal of Transplantation* (11%) had the highest number of publications, however 3/5 of the top cited papers were published elsewhere (Fig 1).The main topics by citation count were medical renal disease, drug monitoring, and compliance (Fig 2).The majority (90%) of the top cited papers were published after 1991, reflecting the year the internet became mainstream, as well as the introduction of open access and predatory journals. There was no difference in the citation count between papers published before and after 1991 (75±24 vs. 80±42; p=0.59), however, there was a significant difference in impact index for the same time period (48±15 vs. 22±10) (Fig 3).
Conclusions: The 200 most cited PRT papers were concentrated in 3 journals, but the top 3 cited papers were published elsewhere. Recent publications were cited more often and found to have a higher impact than older papers. Despite the importance of surgical management in transplantation, there is a paucity of high-impact papers on this topic.

MP2-15

What can we learn from an innocent bystander? Contralateral linear growth patterns in children with hydronephrosis

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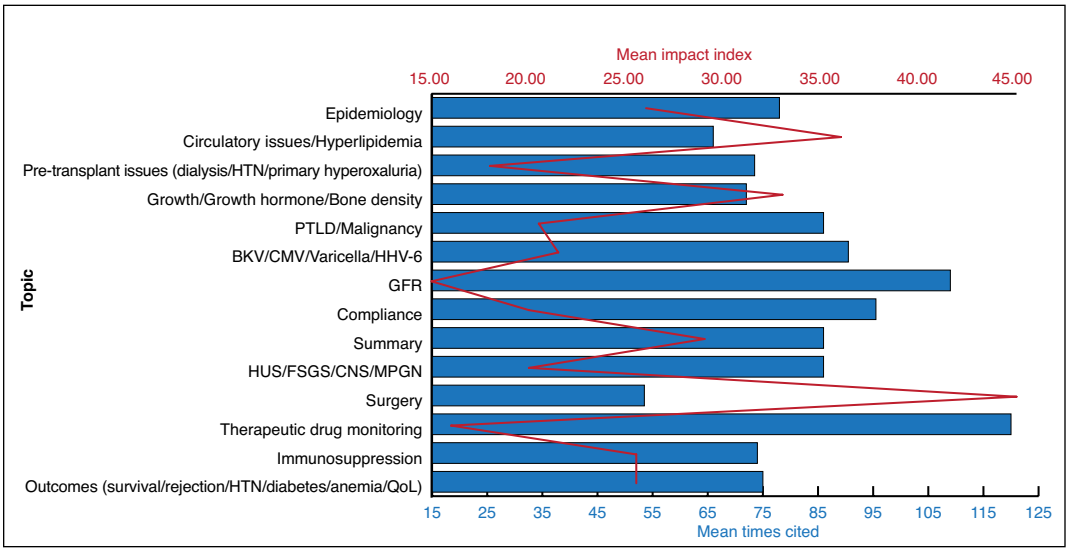
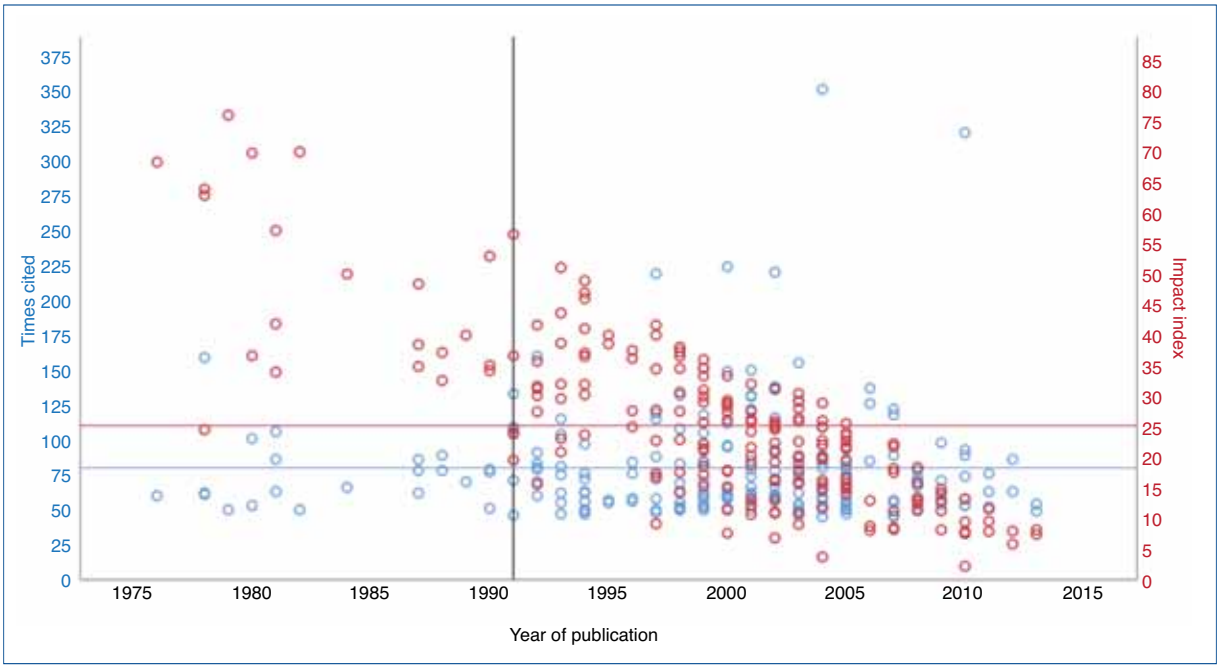
Introduction: During management of patients with hydronephrosis (HN), clinicians routinely look for features that could be used to predict the need for surgery while avoiding invasive tests. Previous studies have suggested that the presence of contralateral compensatory hypertrophy forecasts poor function of affected units, yet little is known about the value of linear growth patterns. Utilizing data obtained from serial ultrasound imaging, specifically related to growth patterns would be ideal. Herein, we explored the percentage change of linear lengths of both kidneys to determine how surgical intervention impacts this variable.
Methods: We reviewed our database of patients with HN (n=642), selecting children <24 months at baseline. We excluded children with associated uropathies, for a total of 298 children included in this analysis. Data were collected on etiology, severity of HN (SFU grades [classified as low (I/II) and high (III/IV)], APD and ERP measurements), differential function (DF), development of UTIs, and surgical interventions. The highest SFU grade, APD/ERP measurements, t½ time, isotope retention, and lowest DF were extracted. We calculated the percentage of improvement of APD (PIAPD) and ERP (PIERP), as well as percentage of change of linear length for both ipsilateral and contralateral kidneys
Results: Mean age at baseline was 5±5 months, 74% were male and 66% had left-sided HN. The majority (56%) of infants had UPJO-like HN, 16% megaureter, and 28% VUR. Most children (63%) had high-grade HN, with a maximum of APD of 16±15 mm and a minimum DF of 54±14%. At a mean followup of 32±33 months, 25% underwent surgery. The most common surgical procedures were pyeloplasty (55%), ureterovesicostomy (20%), and endoscopic injection (17%) (Table 1). At baseline, length of the affected kidney was 62±11 mm vs. 56±8 mm for the contralateral (p<0.01) and 75±15 mm vs. 72±15 mm at last followup (p=0.01). Despite a similar growth pattern rate for both units, when we calculated the percentage of change in linear length from baseline to followup, we noted an increase of 16±15% in the affected kidney vs. 20±14% in the contralateral kidney (Fig 1).

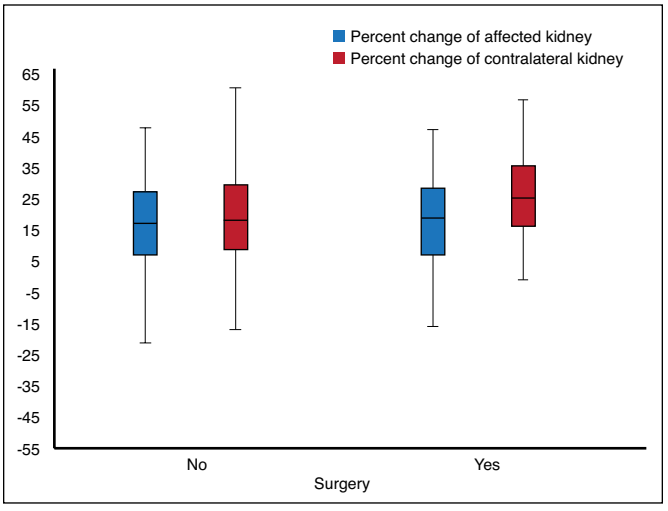


MP2-14. Fig. 2. Mean times cited and mean impact index by topic.



MP2-14. Fig. 3. Times cited and impact index by year of publication.

Conclusions: Despite a difference in baseline and last followup lengths, we noted a significant difference in overall percentage of renal length change, indicating that while both renal units appear to grow at the same proportional rate, contralateral kidneys grow proportionally more, which is especially true in surgical cases. These findings deserve further attention, as contralateral growth pattern may be a non-invasive predictor of long-term function



MP2-15. Fig. 1.

MP2-16

Is renal linear growth a good marker for contralateral compensatory hypertrophy in patients with unilateral congenital kidney anomalies?

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Introduction: In patients with unilateral renal abnormalities, such as hydronephrosis (HN), it is believed that the sonographic appearance of the normal contralateral moiety could provide insight into the functional potential of the affected kidney. Herein, we explored the renal growth pattern of patients with isolated HN focusing on the unaffected contralateral kidney, to determine if those units followed different linear growth patterns that could be used to infer outcomes.

Methods: We reviewed our database of patients with HN (n=642), selecting children <24 months with unilateral dilatation. We excluded children with other associated uropathies and/or bilateral involvement for a total of 213 children included this analysis. We collected data on etiology, severity of HN, differential function (DF), and surgical interventions. The highest SFU grade and APD measurement, as well as lowest DF were extracted. Renal length for both units was recorded at each followup visit, allowing estimation of rate of growth in mm/month. SFU grades were classified as low (I/II) and high (III/IV).

Results: Mean age at baseline was 4±4 months; 76% were male and 67% had left-sided HN. The majority (61%) of infants had UPJO-like HN, 20% megaureter, and 19% VUR. Most children (70%) had high-grade HN, with a mean max APD of 17±13 mm and mean min DF of 43±14%. At a mean followup of 30±33 months, 24% underwent surgery. At baseline, length of the affected kidney was 63±12 mm vs. 56±7 mm for the contralateral ($p<0.01$), a difference that persisted at last followup (76±15 mm vs. 70±14 mm; $p<0.01$) (Fig. 1). However, growth for the affected side (0.8±3 mm/month) vs. the contralateral side (1.0±1.2 mm/month) was not different ($p=0.47$), suggesting that despite discrepancies in length during monitoring, linear growth was similar irrespective of the presence of dilatation (Fig. 2). These findings endured when stratifying for severity, APD, DF, UTIs, and etiology. Similarly, there was no significant difference in the growth between surgical and non-surgical cases.

MP2-15. Table 1

	Non-surgical n=222 (%)	Surgical n=76 (%)	p
Age (months)	4±4	5±5	0.51
Gender			
Male	169 (76)	52 (68)	0.22
Etiology			
Etiology			
UPJO-like	125 (56)	42 (56)	NS
POM	32 (14)	17 (22)	
VUR	65 (30)	17 (22)	
Max SFU grades			
Low	96 (43)	13 (17)	<0.01
High	126 (57)	63 (83)	
Maximum APD	12±7	27±18	<0.01
Maximum ERP	12±10	30±21	<0.01
Minimum DF			
Affected	47±15	41±14	0.02
Contralateral	52±15	57±13	0.05
Maximum T ½ (min)			
Affected	31±18	55±14	<0.01
Contralateral	9±8	13±14	0.06
Maximum isotope retained (%)			
Affected	63±21	91±13	<0.01
Contralateral	25±15	29±20	0.19
Baseline length (mm)			
Affected	60±10	68±14	<0.01
Contralateral	55±7	58±9	0.03
Length at last followup			
Affected	73±14	82±14	<0.01
Contralateral	70±13	78±17	<0.01
Change in length (%)			
Affected	16±14	15±17	0.56
Contralateral	18±14	24±14	<0.01
PIAPD (%)	38±38	59±32	<0.01
PIERP (%)	43±42	60±33	<0.01
Maximum followup (months)	28±31	42±35	<0.01

Conclusions: In our population, affected kidneys were significantly larger at baseline and remained so at last followup, while demonstrating equal rates of growth as unaffected contralateral moieties; these findings remained when stratified by important covariates. Contralateral linear renal growth on serial ultrasounds is a poor indicator of compensatory response of the contralateral kidney in infants with prenatal HN and appears to lack predictive value for detecting negative sequela for the affected kidney, suggesting that compensatory hypertrophy may only occur when DF is compromised.

MP2-17

Inverted kidney: Single-center experience with "upside down" positioning of renal allograft during pediatric transplantation

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Introduction: For structural reasons, during transplantation the allograft is preferentially transplanted into the right iliac fossa, therefore, an allograft with vascular anatomical variants (such as a short renal vein) may pose a challenge. As an option, the donor kidney may be placed in an inverted fashion in order to establish a more straightforward anastomosis for the vessels. Herein, we reviewed our experience of inverted renal transplants in pediatric patients with at least 1 year of followup.

Methods: We reviewed all patients having a renal transplant between January 2012 and December 2016. We identified children who underwent an inverted renal transplant and extracted perioperative and postoperative data. Because all inverted transplants were from deceased donors, living donor transplants were excluded. Inverted positioning of the allograft in the flank and pelvic cavity is as demonstrated in Fig. 1. We defined early graft function as the time to reach creatinine nadir and patients were censored at time of last followup.

Results: Of 81 transplants, 50 (62%) were from deceased donors and 6 (12%) received inverted renal grafts. Half (3/6) were female, 5/6 (83%) were dialysis-dependent, 5/6 received right allografts, and preoperative serum creatinine was 766.3 μmol/L^{-1}(range 438–1500 μmol/L^{1}). Weight at surgery was 35 kg (15.6–56.3), median age was 13 years (4–17), and followup was 36.6 months. The common iliac artery was the anastomosis site for 50% of the patients, the external iliac for 33.3%, and the aorta in 1 patient. The vena cava was the anastomosis site for 50% of the patients, the external iliac for 33.3%, and the common iliac for one patient. End-to-side ureteroureterostomy was performed in 5/6 patients, with ureteroneocystotomy in the other. There was no difference in time to creatinine nadir of the upright group (12±9 days) vs. the inverted group (9±4 days) (p=0.43) (Fig. 2). We also found no significant differences in the rates of postoperative complications between children who received upright vs. inverted allografts (Fig. 3/Table 1).

Conclusions: Inversion of renal allografts (i.e., "upside-down" kidney) in pediatric patients is a viable surgical technique to compensate for shortcomings in anatomy or in special cases of renal transplantation involving a short donor renal vein. Future research in this field should focus on the outcomes of a larger group of pediatric transplant recipients with inverted allografts to lend support to the suitability and safety of this procedure in this patient population.

MP2-18

Development of a standardized approach for the assessment of bowel and bladder dysfunction

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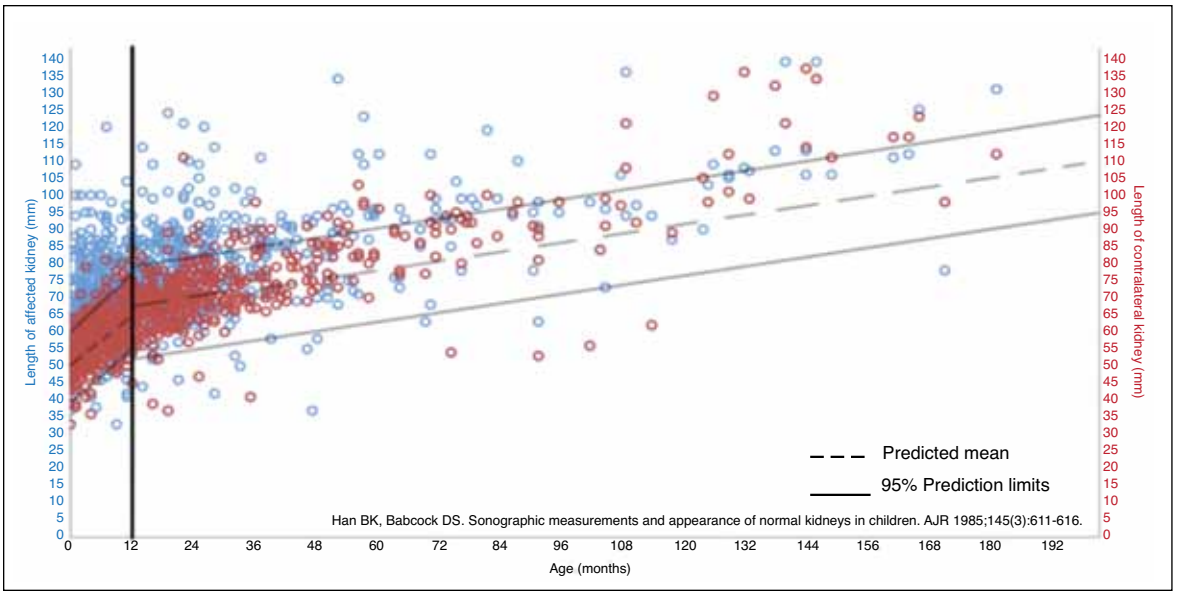
Introduction: Bowel and bladder dysfunction (BBD) is a common yet underdiagnosed pediatric condition that describes a constellation of lower urinary tract symptoms (LUTS) associated with constipation and/or encopresis. Many children with BBD have comorbid neuropsychiatric symptoms and psychosocial stressors, which are not routinely assessed. Presently, there is no standardized approach for a comprehensive assessment of BBD. We aim to develop and evaluate physician and parent perceptions with 1) a standardized BBD history and physical intake form for physicians; and 2) a parent-reported intake form.

Methods: From June to October 2017, a quality improvement study was conducted in the BBD network, an existing pediatric collaborative initiative consisting of 7 community sites with support of the pediatric urology division in a tertiary hospital. Based on literature review and expert opinions, a standardized intake form was developed for BBD assessment with targeted questions for LUTS, constipation, and psychosocial history, along with a physical exam checklist for neurological red flags. Further, a shorter parent-reported intake questionnaire was developed to clarify patterns of dysfunctional voiding symptoms, dietary recall, and stool history. Both forms underwent usability testing and iterative refinement. Prior to clinic, families of children referred for BBD were mailed an intake package for completion. During the clinic, physicians were asked to use the standardized intake form for new referrals. Afterwards, both physicians and parents were given anonymous surveys to evaluate their perceptions of the intake process.

Results: A total of 8 physicians and 20 parents responded, with 60% of patients being between ages 4–10 and 55% male. Physicians found the standardized intake form to be a useful guide that reminded them to ask about specific urinary symptoms (88% of the time), constipation (75%),



MP2-16. Fig. 1. Linear lengths of affected and contralateral kidneys by age.

and psychosocial history (76%). The majority of physicians (75%) agreed they would use the intake form again and recommended its implementation. Further, parents responded positively by agreeing that the intake package was easy to complete (65%), felt included in care decisions (95%), and had questions answered appropriately (100%).

Conclusions: In assessment of BBD, a standardized intake form can help guide physicians to efficiently gather a comprehensive history, rule out red flags, and screen for psychosocial risk factors. With refinements, it can potentially help create a common clinical experience and empower more pediatric urologists and pediatricians to manage BBD in the future.

MP2-19

Lower urinary tract injury: Is urology consultation necessary?

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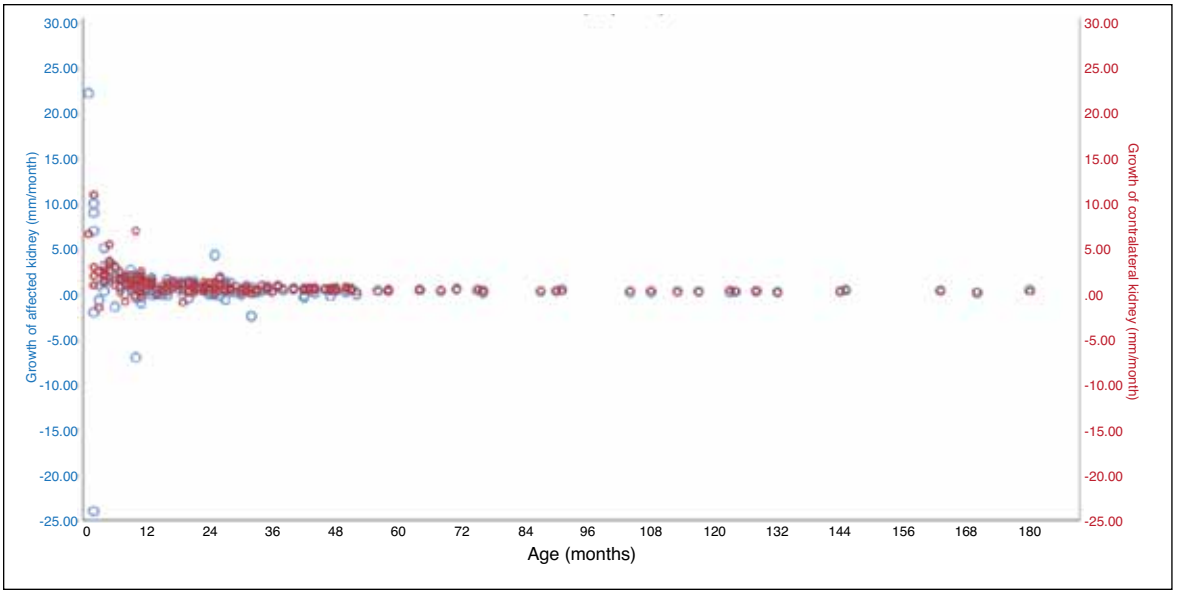
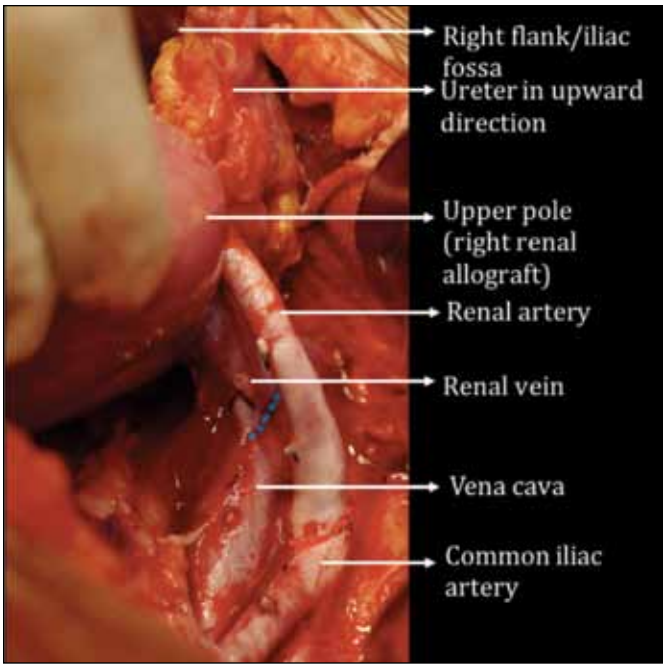
Introduction: There is a paucity of data regarding urology involvement in the management of lower urinary tract injuries (LUTI). We seek to analyze the epidemiology of LUTI with special attention to trends in urology consultation.

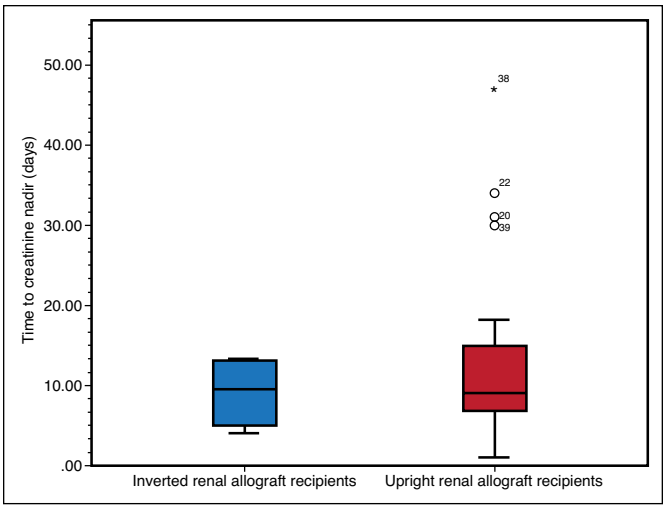
Methods: A retrospective review was conducted of all patients presenting to our Level I trauma center with LUTI from 2002–2016. LUTIs were categorized as injury to bladder, urethra, or both. Demographics, mechanism of injury, associated injuries, injury severity score (ISS), AAST bladder and urethral injury scales, and clinical hospital course were analyzed.



MP2-16. Fig. 2. Growth rate.

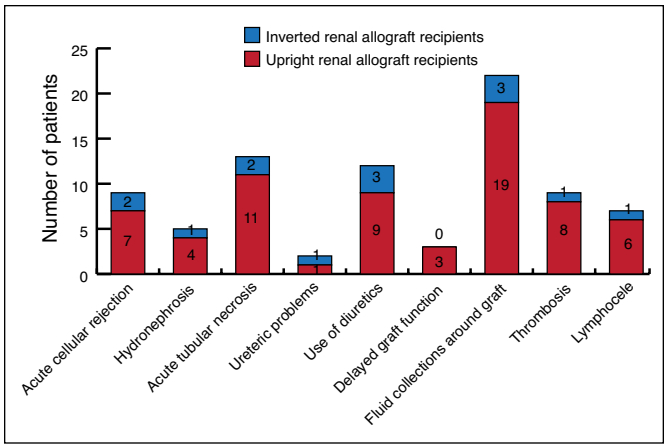


MP2-17. Fig. 1.



MP2-17. Fig. 2. Pediatric deceased donor renal transplant patients from 2012–2016.

Results: A total of 140 patients (0.47% of all trauma patients) were identified with LUTI over the study period. Hospital mortality was 9.2% (13/140). Blunt trauma comprised of 72.1% of total LUTI. Pelvic fracture was associated in 60.7% of LUTI. Bladder injuries were more common than urethral injuries (79% vs. 14%), with 6% of patients having both. Overall, 58% of all LUTI patients were managed conservatively. Of 140 LUTI patients, 25 patients (18%) did not receive urology consultation. There was no significant difference in sex, age, or LOS (hospital and ICU) between the consult and non-consult groups. The consult group



MP2-17. Fig. 3. Postoperative complications.

MP2-19. Table 1. Comparison of ISS/AAST organ injury scale*

	Consult	Non-consult	p
ISS	21.65±12.6	27.88±15.1	0.034
Bladder and urethra combined	2.69±1.1	2.08±0.91	0.008
Bladder	2.57±1.0	2.04±0.91	0.023

*Expressed as mean ± standard deviation.

MP2-19. Table 2. Comparison of method of diagnosis of LUTI*

Diagnosis method	Consult	Non-consult	n	p
Test of independence				0.002
Trauma imaging (CT)	35 (30.4)	9 (36)	44	0.64
Intraoperative finding	21 (18.3)	8 (32)	29	0.18
Cystogram/RUG	58 (50.4)	5 (20)	63	0.007
Laboratory/PE	1 (0.9)	3 (12)	4	—

*Expressed as n (%).

had a lower ISS (21.7 vs. 27.9; p=0.034), but a higher AAST bladder injury scale (2.57 vs. 2.04; p=0.023), than the non-consult group (Table 1). All patients with an AAST injury scale ≥4 received a urology consult. As shown in Table 2, there was a statistically significant difference in the diagnosis methods between the two groups (Chi-square test of independence, p=0.002). More LUTI in the consult group were diagnosed based on cystogram/RUG than the non-consult group (50% vs. 20%; p=0.007). **Conclusions:** Our data demonstrates that, although not a major determinant in LOS, urology consultation plays an important role in the management of LUTI with high AAST injury scale. While more studies are needed to look at the degree of urology service involvement in the management of LUTI, we recommend a consultation be initiated for severe LUTI or when the management of injuries is out of the comfort zone of the trauma surgeons.

Moderated Poster Session 3: Oncology – Bladder, Renal, Testes

Moderators: Joseph M. Jacob, MD, MCR, SUNY Upstate; John M. Rutkowski, MD

MP3-01

Biopsy for small renal masses: Histopathologic concordance with final kidney pathology and features predicting non-productive biopsy

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Western University[1]; Western University, Department of Surgery, Division of Urology[2]; Windsor Regional Hospital, Department of Pathology[3]; Windsor Regional Hospital, Department of Surgery[4]

Introduction: The incidence of renal cell carcinoma (RCC) is rising and often presents incidentally as an asymptomatic enhancing small renal mass (SRM) measuring less than 4 cm on imaging. Unfortunately, a majority of SRMs are RCC, yet a significant amount of low-grade RCC and benign pathology can masquerade with higher-grade RCC features and vice versa. Due to rates of non-productive biopsy, current guidelines in Canada suggest nephrectomy as first-line management after imaging and only suggest a biopsy prior to ablation. We investigated the accuracy of small renal mass biopsy and clinical factors that may predict a non-diagnostic biopsy.
Methods: A retrospective review of computed tomography or ultrasound-guided percutaneous renal mass biopsies performed at Windsor Regional Hospital over the past 5 years were evaluated. Initial diagnostic biopsy results were correlated with final pathology in patients that underwent surgery. Clinical factors (gender, BMI, mass size, pole, position, kidney side) were also analyzed under a logistical regression to predict a non-diagnostic result.
Results: Records of 200 patients (226 biopsies) with a mean age of 67.6 years who underwent percutaneous biopsies for a SRM were reviewed. The overall non-diagnostic rate was 15% (n=34). Of the biopsies performed 22% (n=50) were benign, while 63% (n=142) were malignant. 61 (30.5%) patients underwent surgery, with a total of 63 biopsies. Biopsy concordance was documented in 59 (93.6%) of biopsies, with 100% being malignant. The calculated sensitivity and specificity were 92% and 100%, respectively. No patients experienced post-biopsy complications. Of the patient and tumor factors analyzed, our data shows the only statically significant predictor was the position of the mass, as characterized by being either endophytic or exophytic (p=0.032). Given all other variables are equal, our data shows the odds of a producing non-diagnostic biopsy from an endophytic mass is 3.4 times more likely than an exophytic mass.
Conclusions: Our results show that diagnostic biopsies of SRM are highly accurate in predicting final pathology, particularly for malignant subtypes of RCC. Our data suggests that an endophytic mass could possibly be a predictor of an unsuccessful biopsy.

MP3-02

Aggressive end-of-life care in Medicare bbeneficiaries dying with bladder cancer

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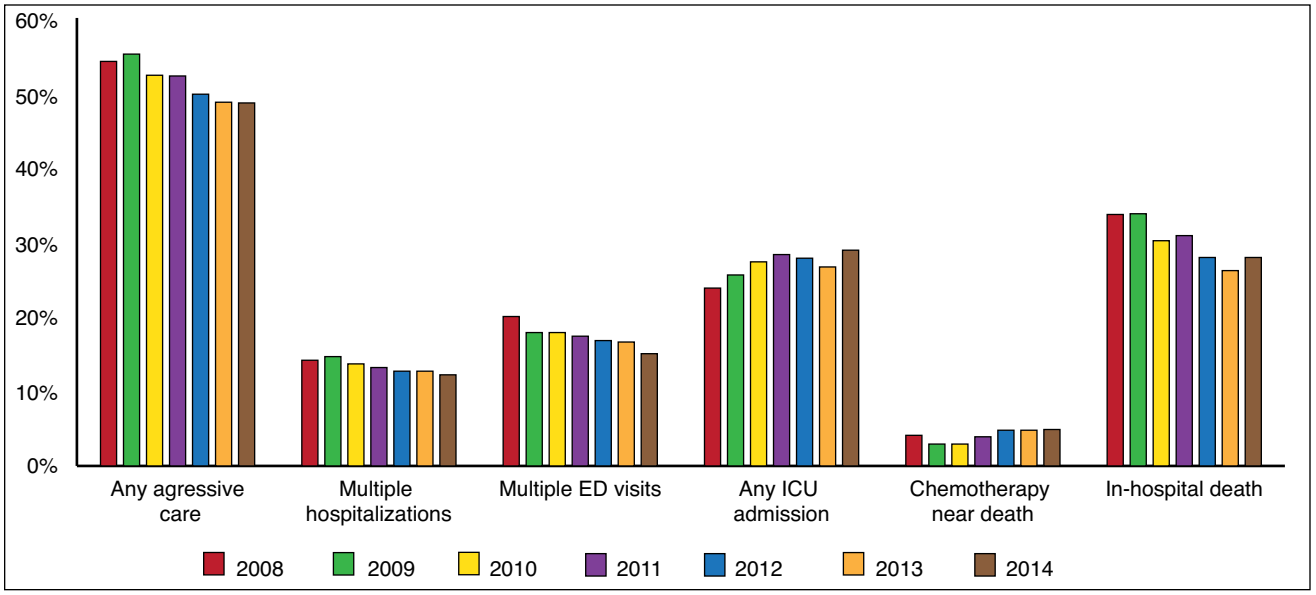
Department of Urology, University of Pittsburgh School of Medicine[1]; Department of Medicine, University of Pittsburgh School of Medicine[2]; Charleston Area Medical Center[3]; UPMC[4]

Introduction: Aggressive care at the end of life is associated with worse quality of life and is thought to not benefit outcomes. In the United States, there is significant variation in the receipt of aggressive end-of-life care and up to 50% of patients dying with cancer receive aggressive care during the last month of life. Variation in this potentially non-beneficial care has been proposed as a quality metric of healthcare at the end of life.



MP3-02. Fig. 1.

CUAJ • September 2018 • Volume 12(9Suppl4)

However, aggressiveness end-of-life care is not characterized in patients with bladder cancer. We aimed to determine the rate of aggressive care in a cohort of patients dying with bladder cancer.
Methods: We used Surveillance, Epidemiology, and End Results-Medicare data to conduct a population-based study of patients who were diagnosed with bladder cancer and died from 2008–2014. Our primary outcome was receipt of aggressive end-of-life care. We defined aggressive care as one or more of the following in the last 30 days of life: >1 hospital admission, >1 emergency department visit, any intensive care unit admission, receipt of chemotherapy in the last 14 days of life, or death in an acute care hospital.
Results: Among 13 253 patients, 6861 (52%) experienced at least one measure of aggressive end-of-life care. Overall, 13.3% had >1 hospital admission,17.4% had >1 emergency department visit, and 27.8% had an intensive care unit admission. In the last 14 days of life, 564 (4.3%) patients received chemotherapy. 3923 (29.6%) died in an acute care hospital. Trends of these metrics are shown in Fig. 1.
Conclusions: Aggressive end-of-life care is prevalent among patients dying with bladder cancer. We feel these data are an important step toward improving quality of end-of-life care for bladder cancer patients.

MP3-03
Landscape of palliative care use among Medicare beneficiaries with bladder cancer

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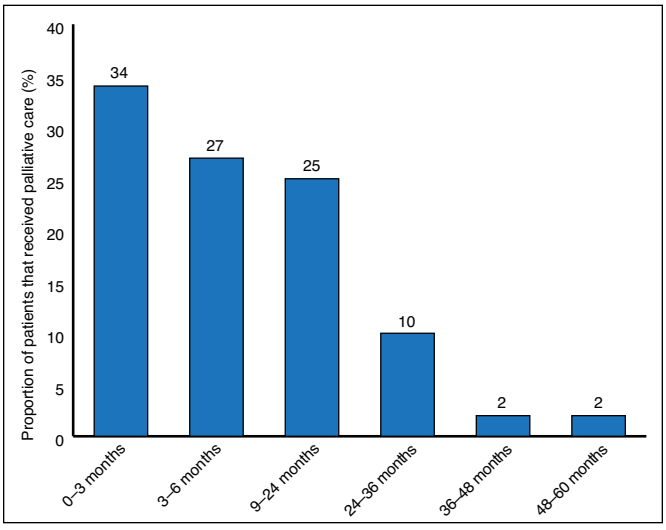
Introduction: Palliative care provides a host of benefits for cancer patients, including improved spirituality, decrease in disease-specific symptoms, and better functional status. Although palliative care has been studied in other malignancies, use in bladder cancer patients is uncharacterized. For these reasons, we performed a population-based cohort study to characterize palliative care use among bladder cancer patients in the United States. In describing the rate and determinants of palliative care use, our objective was to advance a national dialogue framing palliative care as a key component of quality and patient-centered bladder cancer care.
Methods: Using Surveillance, Epidemiology, and End Results-Medicare data, we identified patients diagnosed with muscle-invasive bladder cancer from 2008–2013. Our primary outcome was receipt of palliative care, defined as the presence of a claim submitted by a hospice and palliative medicine specialty provider. We examined demographic and clinicopathologic determinants of palliative care use with a multivariable mixed methods model using logistic regression.
Results: Over the study period, 7303 patients were diagnosed with muscle-invasive bladder cancer and 262 (3.6%) received palliative care. Most patients that received palliative care (85%, 226/262) did so within 24 months of diagnosis. On multivariable analysis, patients receiving palliative care were more likely to be younger, female, had greater comorbidity, and underwent radical cystectomy as opposed to a bladder-sparing approach. The adjusted probability of receiving palliative care was 2.8% in 2008 compared to 3.8% in 2013 (p>0.05).
Conclusions: Despite strong evidence for incorporating palliative care into standard oncologic care, use in patients with bladder cancer is low at 4%. This study provides a conservative baseline estimate of current use and should serve as a platform to further investigate patient- and system-level barriers to palliative care use. Future studies must determine how new guidelines affect rates of use, uncover unmet needs, and identify patents most likely to derive benefit from this care.



MP3-03. Fig. 1. Time from diagnosis to palliative care.

MP3-04
Iron supplementation and anemia have independent prognostic value in localized renal cell carcinoma patients undergoing nephrectomy

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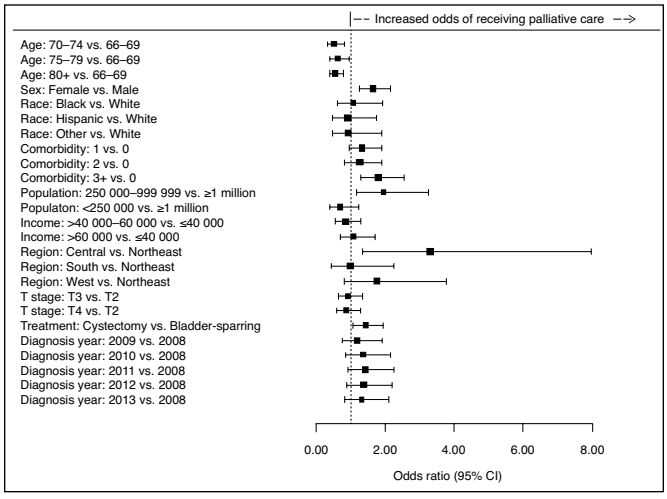
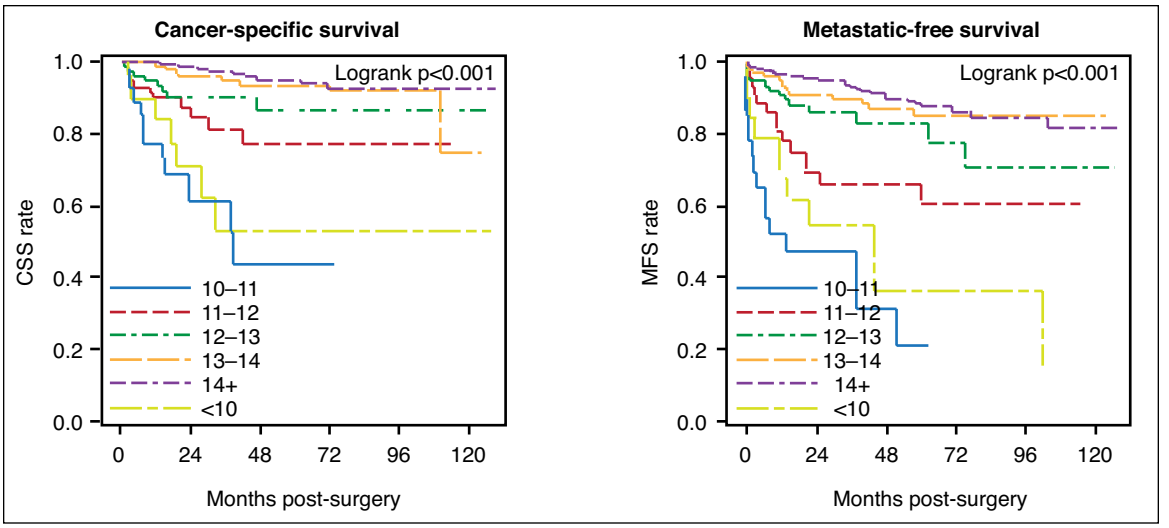
Introduction: Anemia is a well-characterized adverse prognostic factor for metastatic renal cell carcinoma (RCC) patients, however, its significance in localized RCC is unclear. Anemic patients are frequently on supplementation with iron, which both epidemiologic and animal research suggests to be a kidney-specific carcinogen. However, the prognostic impact of iron supplementation in RCC patients has not previously been studied. We investigated whether either iron supplementation or anemia is associated with adverse oncologic outcomes in nephrectomy patients with localized RCC.
Methods: After exclusion of N+ and M+ patients, medical records of 770 patients who underwent a partial or radical nephrectomy for localized RCC from 2006–2016 at a National Comprehensive Cancer Network institute were retrospectively studied. Preoperative anemia was defined by a hemoglobin (Hgb) value within the lower 5th percentile using validated age-, gender- and race-adjusted cutoffs. Microcytic anemia was defined by a red blood cell mean corpuscular volume.
Results: Lower Hgb, anemia, and microcytic anemia were each strongly associated with adverse tumor pathology, including size, grade, stage and



MP3-03. Fig. 2.



MP3-04. Fig. 1.

sarcomatoid histology (all p<0.001); whereas iron supplementation was associated with grade (p=0.036) and sarcomatoid histology (p<0.01). In survival analyses, lower Hgb, anemia, and microcytic anemia were each strongly associated with worse MFS and CSS (all p< 0.001), and remained so after adjustment for tumor size, stage, grade, and iron supplementation. Iron supplementation was strongly associated with worse MFS (p<0.001) but not worse CSS (p=0.44), and remained so after adjustment for tumor size, stage, grade, and patient anemia, but not after adjustment for microcytic anemia.

Conclusions: Preoperative iron supplementation and anemia are independent prognostic factors associated with worse oncologic outcomes among non-metastatic RCC patients undergoing nephrectomy.

MP3-05

Unprecedented marketing for novel Systemic kidney cancer therapy: Physician-directed money in the open payments database

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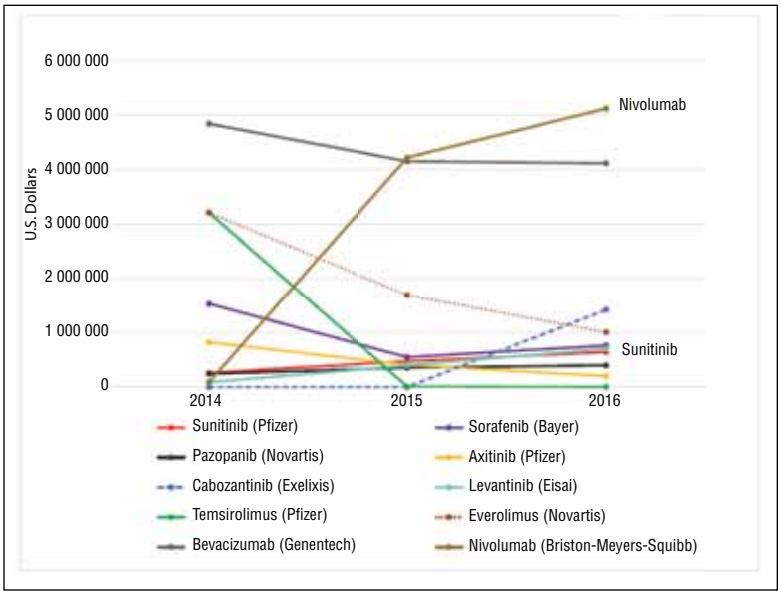
Introduction: Reporting of drug company payments to physicians began in 2013 through the Open Payments (Sunshine) Act. In an unprecedented proliferation of metastatic renal cell carcinoma (mRCC) drugs since 2005, nivolumab, cabozantinib, and levantinib gained approval during the Open Payments era. We sought to characterize trends in to-physician payments in an increasingly competitive mRCC drug landscape. We hypothesized that money to physicians for drugs with novel mechanisms would exceed that of established tyrosine kinase and mammalian target of rapamycin-directed agents, and would correlate with number of approved indications.

Methods: To-physician payments for food, speaking, consulting, travel, and venue rental were abstracted from the Open Payments database 2014–2016. Drugs on the market prior to Open Payments reporting included sorafenib, sunitinib, pazopanib, axitinib, temsirolimus, everolimus, and bevacizumab. Drugs included that were approved in the Open Payments era were nivolumab, cabozantinib, and levantinib. Multivariable linear regression determined factors associated with increased payments to physicians.

Results: Most payments (75–99%) purchased food, with a median payment of $14.69 (interquartile range [IQR] 11.68–15.60). Speaking and consulting (1–12% of payments) were more costly, with median payments of $2500 (IQR $1100–2875) and $2062 (IQR $1100–2800), respectively. To-physician payments by drug companies for each mRCC therapy are shown in Fig. 1. Among drugs entering the market during the Open Payments era, all had a positive slope since market entry. However, growth of payments for nivolumab were unprecedented among mRCC drugs, superseding payments for all others by 2016. On multivariable linear regression, drug mechanism, fewer years since latest FDA indication, and greater number of indications were associated with increased payments to physicians.

Conclusions: Dramatic variation in quantity of to-physician payments was observed among 10 competing drugs indicated for mRCC. New drugs all demonstrated increased payments since first approval, but nivolumab was a dramatic outlier. This is likely related to its multiple indications and novel mechanism. More work is needed to determine impact of to-physician payments on prescribing patterns relative to clinical evidence.



MP3-05. Fig. 1. Drug company payments to physicians for kidney cancer therapies, 2014–2016.

MP3-06

Comparison of upper tract urothelial carcinoma and bladder carcinoma survival: A SEER database analysis

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Introduction: Less than 5% of urothelial carcinoma cases are located in the upper tract (UTUC), yet management is based primarily on experiences in bladder urothelial carcinoma (BUC). There has been variability in reported survival outcomes between UTUC and BUC, and there has been question of the impact of disease location within the upper tract. We aim to compare survival outcomes for UTUC and BUC based on stage and grade, and secondarily determine if difference in survival exist based on UTUC tumor location of renal pelvis (RPUC) vs. ureter (UUC).

Methods: SEER-18 registries database was queried for patients diagnosed with either UTUC or BUC. Only patients with a single primary malignancy undergoing cystectomy or nephroureterectomy (NU) were included. Patients with M1 disease, N1/N2/N3 disease, Ta/Tis/T0 disease, and unknown grade, stage, or node status were excluded from analysis. Chi-square and ANOVA analyses were used for categorical and continuous variables. Cox proportional hazards analysis was used to identify factors associated with CSS.

Results: A total of 4925 BUC subjects and 3319 UTUC subjects were included. Significant differences were seen in gender, age, grade, stage, and lymph node dissection (LND) ($p<0.001$). No significant difference was seen in CSS. Significantly worse CSS was seen in UTUC pT2 and pT4 disease versus BUC ($p=0.032$ and $p<0.001$, respectively). Survival benefit seen in BUC in multivariate with HR 0.9 ($p<0.001$). Survival advantage also seen with LND (HR 0.63; $p<0.001$). Worse survival was associated with high grade and advanced stage disease ($p<0.001$). In comparing RPUC and UUC, significant differences in stage distribution were seen ($p=0.001$). RPUC had significantly worse survival in pT3 disease ($p<0.001$). In multivariate, LND had a survival benefit (HR 0.8; $p=0.015$) and RPUC had significantly worse survival (HR 1.2; $p=0.008$).

Conclusions: UTUC was found to have significantly worse survival in high grade and later stage disease. Survival was found to be worse for RPUC vs. UUC. A significant survival advantage was seen with LND in UTUC regardless of UTUC location, yet it was only performed in 20% of UTUC subjects. This study suggests that LND with NU may offer better outcomes.

MP3-07

Factors associated with length of stay and discharge disposition for elective bladder cancer surgical admissions: A SPARCS analysis

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Introduction: Bladder cancer (BCa) surgical admissions are among the most challenging for optimizing discharge parameters in urology. Multiple factors have been identified that impact general inpatient length of stays (LOS) and discharge disposition, including insurance status and early mobilization. We sought to identify factors that impact LOS and discharge disposition among patients undergoing elective surgery for BCa in New York state (NYS).

Methods: The New York Statewide Planning and Research Cooperative System database (SPARCS) was queried for discharges between 2009 and 2015 in NYS. All patients who had an elective inpatient admission for BCa involving a major procedure were included. Outcomes of interest were LOS and discharge disposition to home. Hospital county, age group, gender, race, All Patient Refined (APR) severity of illness (SOI), All Patient Refined (APR) risk of mortality (ROM), source of payment, and admitting provider type were analyzed.

Results: 1804 patients were discharged after an elective surgical admission for BCa. 52% of patients were aged 70 or older, 77% were male, 88% were white, and 62% of patients had Medicare. 62.4% of patients were categorized into "major" APR SOI and 39.0% were categorized into a "moderate" APR ROM. 93.6% of patients were admitted to the operating provider. The mean LOS was 9.4 days (range 1–65). 27.4% of patients were discharged home without home health services, 59.4% discharged home with services, 9% to a skilled nursing home, 1.7% to inpatient rehabilitation, and 1.2% expired. On multivariate analysis, factors associated with longer LOS included age 70 or older, African American race, extreme APR SOI, major to extreme APR ROM, and non-operating admitting provider (all $p<0.05$). Factors associated with discharge not to home on multivariate analysis included age 70 or older, major to extreme APR SOI, moderate to extreme APR ROM, and county of admission (all $p<0.05$).

Conclusions: Patients admitted for elective surgical admissions for BCa have LOS averaging around 9.4 days and are at risk to remain in the hospital longer if they are older, African American, have higher APR severity of illness and risk of mortality, and/or are admitted to a non-operating provider. Only 27.4% of patients are discharged home without services, and this is decreased by older age, higher APR severity or illness and/or risk of mortality, and county of admission. Patients at risk should be identified to maximize efforts for timely discharge and optimal disposition.

MP3-08

Trends in age at diagnosis of bladder cancer in the United States: 2004–2015

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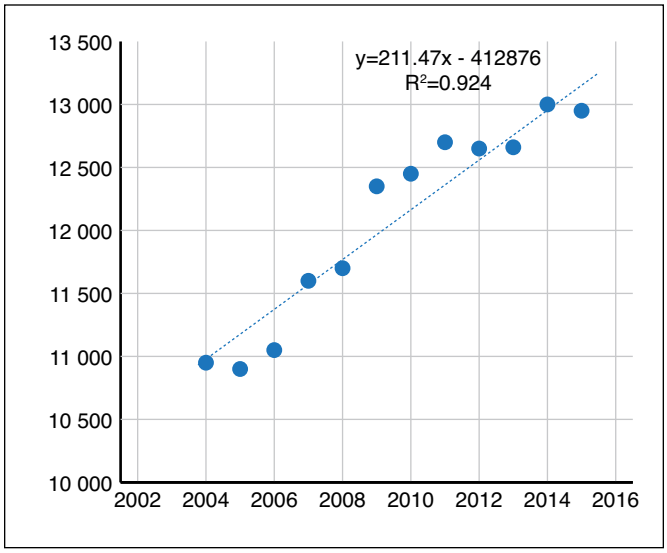
Introduction: The risk factors and demographic characteristics associated with bladder cancer (BCa) have been extensively documented in the literature. Recently, there has been exploration of emerging exposures that could correlate with a younger age of diagnosis, as well as case studies documenting younger adults presenting with BCa. Despite this, there is limited investigation of shifts in the age distribution of this disease. The objective of this study is to examine trends in age at diagnosis of BCa between 2004 and 2015.

Methods: BCa cases were selected from the National Cancer Database, a nationwide clinical oncology registry. The trend in average age of diagnosis was examined by year for 2004–2015. Mean age of diagnosis across this period was then trended among different age categories (34 and younger, 35–64, 65–79, 80 and older). Results were plotted and R-squared values were calculated for each age group. Chi-square analyses were conducted to analyze baseline characteristics of the study sample, stratified by age category. P values ≤0.05 were considered to be statistically significant.



MP3-08. Fig. 1. Number of patients diagnosed under age 65, 2004–2015.

Results: Across the study period, the highest proportion of BCa diagnoses were attributable to patients aged 65–79. Overall, the mean age at diagnosis followed an increasing trend between 2004–2015. However, after stratifying by age, this trend was not observed in the 65–79 age group, which demonstrated a decrease in average age at diagnosis across the study period. The incidence of BCa in the youngest age group (34 and younger) showed a 13.7% increase when comparing 2004 to 2015, with the highest proportion of diagnoses in this age group occurring in 2015. Overall, the incidence in patients under age 65 increased steadily over this time period, showing an 18.5% increase when comparing 2004 to 2015.
Conclusions: Between the years 2004 and 2015, the average age at diagnosis of BCa has not remained stable. An increasing trend was observed in the cohort overall, as well as among the 34 and younger, 35–64, and 80 and older age categories, while the average age at diagnosis among patients aged 65–79 decreased consistently across the study period. There was also an increase in incidence among younger patients. These findings may suggest evolving care-seeking behaviors and exposures among different age groups.

MP3-09

The impact of pathologic upstage and outcomes for clinical non-muscle-invasive bladder cancer patients treated with robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium

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Roswell Park Comprehensive Cancer Center[1]; Roswell Park Cancer Institute Department of Urology[2]; Saarland University Medical Center; Department of Urology and Pediatric Urology[3]; Rijnstate Hospital[4]; Wake Forest Baptist Medical Center[5]; Metro Health - University of Michigan[6]; City of Hope[7]; Glickman Urologic Institute, Cleveland Clinic[8]; King's College London, Guy's Hospital, King's Health Partners[9]; Henry Ford Health System[10]; Henry Ford Hospital[11]
Introduction: Stage re-classification is not uncommon after open radical cystectomy for clinically non-muscle-invasive bladder cancer (cNMIBC). We sought to investigate the natural history and outcomes of patients with cNMIBC who underwent robot-assisted radical cystectomy (RARC).
Methods: We retrospectively reviewed the International Robotic Cystectomy Consortium (IRCC) database between 2006 and 2016. cNMIBC was defined as patients who had cTa/Tis/T1, no prior diagnosis of cT2 disease, and did not receive neoadjuvant chemotherapy. Upstaging was defined as development of pathologic muscle-invasive bladder cancer (pMIBC: ≥pT2). Kaplan-Meier method was used to depict recurrence-free (RFS), cancer-specific (CSS) and overall survival (OS). Multivariable stepwise regression model was fit to evaluate predictors of upstaging. Multivariable Cox regression was used to model predictors of RFS, DSS, and OS.
Results: A total of 715 patients (27%) underwent RARC for cNMIBC, of whom 302 (42%) experienced pathologic upstaging. Patients who upstaged were older (69 vs. 67 years; p=0.01) and included more cTis (49% vs. 23%; p<0.001). They showed more positive surgical margins (6% vs. 3%; p=0.03) and were more likely to experience any recurrence (22% vs. 8%; p<0.001). On multivariable analysis, cT1 (OR 2.71; 95% CI 1.29–3.65; p=0.003) and cTis (OR 4.45; 95% CI 2.57–7.68; p<0.001) were associated with pathologic upstaging. Patients who upstaged demonstrated worse 5-year RFS (62% vs. 88%; log rank p<0.001), CSS (69% vs. 96%; log rank p<0.001), and OS (50% vs. 78%; log rank p<0.001) compared to those without upstaging. Multivariable Cox regression analysis revealed that pathologic upstaging was an independent risk factor for RFS (HR 3.30; 95% CI 2.00–5.50), CSS (HR 4.79; 95% CI 1.84–12.42) but not for OS.
Conclusions: Upstaging is common after RARC for cNMIBC and confers to worse oncologic outcomes compared to those without upstaging. Patients with cTis and cT1 are at higher risk for pathologic upstaging compared to patients with cTa. RARC provided excellent disease control in patients with both clinical and pathologic NMIBC.

MP3-10

Discrepancy in clinical-pathologic stage in locally advanced bladder cancer: Results from the International Robotic Cystectomy Consortium

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Roswell Park Comprehensive Cancer Center[1]; Roswell Park Cancer Institute Department of Urology[2]; Rijnstate Hospital[3]; The Smith Institute for Urology, Northwell Health[4]; Wake Forest Baptist Medical Center[5]; Metro Health - University of Michigan[6]; King's College London, Guy's Hospital, King's Health Partners[7]; Henry Ford Health System[8]; Henry Ford Hospital[9]
Introduction: We sought to investigate the accuracy of clinical staging and its effects on perioperative and oncologic outcome in clinical locally advanced bladder cancer patients (cT3/T4) treated with robot-assisted radical cystectomy (RARC).
Methods: We retrospectively reviewed the prospectively maintained International Robotic Cystectomy Consortium (IRCC) database for RARCs performed between 2005 and 2016 (26 institutions from 14 countries). cT3/T4 was defined as patients who had muscle-invasive disease with palpable mass or invasive radiographic findings. Downstaging was defined as organ-confined disease in cystectomy specimen (≤pT2). Kaplan-Meier method was used to depict recurrence-free (RFS), cancer-specific (CSS), and overall survival (OS). Multivariable logistic regression with stepwise selection was fit to evaluate predictors of downstaging. Multivariable Cox regression analysis was used to model predictors of RFS, DSS, and OS.
Results: A total of 284 patients underwent RARC for cT3/T4, of whom 107 (38%) experienced pathologic downstaging. 69 patients (26%) received neoadjuvant chemotherapy, showing no significant difference between the patients who downstaged and those who did not (28% vs. 24%; p=0.50). Patients who downstaged were less likely to have high ASA score (16% vs. 50%; p<0.001), had shorter operative time (354 min vs. 401 min; p<0.001), were less likely to have positive surgical margins (5% vs. 20%; p<0.001), nodal metastasis (27% vs. 39%; p=0.047), and less likely to experience any recurrence (19% vs. 31%; p=0.02). High ASA score (≥3) was a negative predictor of downstaging (OR 0.27;, 95% CI 0.10–0.75; p=0.01). After a median followup of 9 months, those who downstaged demonstrated better 5-year RFS (48% vs. 44%; log rank p<0.001), CSS (86% vs. 71%; log rank p=0.01), and OS (77% vs. 38%; log rank p<0.001). Multivariable Cox regression analysis revealed that pathologic downstaging was an independent predictor for RFS (HR 0.31; 95% CI 0.16–0.58; p<0.001), CSS (HR 0.21; 95% CI 0.06–0.72); p=0.01), and OS (HR 0.22; 95% CI 0.09–0.53; p<0.001).
Conclusions: Downstaging is common after RARC for cT3/T4 bladder cancer patients (especially healthier patients) and confers better oncologic outcomes. These findings highlight the inadequacy of current clinical staging and the future need for novel imaging or biomarkers for accurate staging.

MP3-11

Geo-mapping and spatial analysis of environmental exposures in patients with bladder cancer in upstate New York: An exploratory study

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Introduction: The potential association of environmental exposures with bladder cancer is yet to be elucidated. We aimed to map patients treated with bladder cancer at our institution using Geographic Information Systems (GIS), and further attempted to identify and describe any disease "hot spots."
Methods: A retrospective review of our prospectively maintained database for patients with bladder cancer who visited our institution between 2006 and 2016 was performed. ArcGIS (v 10.4) was used to map patient residential addresses in Erie and Niagara counties in upstate New York. We also conducted a "hot spot" analysis using the Getis-Ord Gi* statistic (using

90–99% confidence intervals). Analysis was conducted at the census block level (the smallest geographic unit used by the US Census Bureau) and accounted for population density of patients older than 50 years. Hot spots were further described in terms of water body quality (using reports from the New York State Department of Environmental Conservation) and industrial site presence (using data from the Environmental Protection Agency Facility Registry Service).
Results: Out of 1543 patients with bladder cancer who visited our institution, 49% lived in Erie and Niagara counties. The mean age was 68 years (SD 13), 68% were males, and 55% used tobacco. Four hot spots were identified. Poor water quality was present in 3 and industrial sites were identified in 2 of the 4 hot spots. Water was contaminated with priority organic pollutants in one hot spot and pathogens in another. Additional suspected contaminants were present in 2 hot spots. Industrial sites produced specialty chemicals and processed food in one hot spot and fabricated metal at a second.
Conclusions: Spatial clustering of patients in 4 hotspots was identified in Erie and Niagara counties in upstate New York. Within these hot spots, water quality and industrial sites of environmental concern were also identified. Future work will involve determining the relationship between these exposures, patient characteristics, and prevalence of bladder cancer.

MP3-12
National trends in management of non-urothelial bladder cancer

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Introduction: Non-urothelial histological variants of bladder cancer present a challenge for management due to their highly variable clinical characteristics and limited research available. Our objective was to determine national treatment trends in the management of these cancers.
Methods: Using the National Cancer Database (NCDB) Benchmark Reports, patients with urinary bladder cancer from the years 2006–2015 were analyzed by stage, histology, and first treatment course. The following histology subtypes were studied: squamous cell carcinoma (SCC), adenocarcinoma (AC), and neuroendocrine (NE). Patients were then subgrouped by stage and first course treatments were tallied. Using the NCDB Participant User File (PUF), demographic data was obtained.
Results: A total of 5128 patients diagnosed with SCC, 3291 with AC, and 3760 with NE stages II–IV were studied. Our analysis revealed the majority of patients diagnosed with non-urothelial bladder cancers are Caucasian: 86%, 80%, and 92% for SCC, AC and NE, respectively. With regard to gender, 77% of NE patients were male, while gender difference was less pronounced for SCC (51% male) and AC (64% male). Patients in all 3 histology categories were most likely to present at stage II (29% SCC, 26% AC, 40% NE; Table 1), followed by stage III for SCC (26%) and stage IV for AC and NE (25% and 34%). Most patients received their care at either a comprehensive community cancer center (41%) or an academic center (38%). The majority of patients diagnosed with SCC or AC were treated with surgery only at all stages studied (2939 or 57% and 1751 or 53%, respectively) . However, those with NE cancer were most commonly treated with surgery and chemotherapy (1558 or 41%). Despite this, surgery alone was the second most common treatment for all stages. Staging over time showed an increase in stages II and IV for NE disease during the years 2004–2015 and a fairly stable incidence in stage III disease.

MP3-12. Table 1. Stage at presentation by histology

	Squamous cell carcinoma	Adenocarcinoma	Neuroendocrine
Stage 0	7%	5%	2%
Stage I	13%	21%	10%
Stage II	29%	26%	40%
Stage III	26%	23%	14%
Stage IV	25%	25%	34%

Conclusions: Non-urothelial bladder cancers most frequently present as muscle-invasive organ-confined disease in Caucasian males. SCC and AC are primarily treated with surgery alone at all stages of disease, while a majority of those with NE histology are treated with a combined approach of surgery and chemotherapy. However, a large number of those with NE still receive surgical treatment only.

MP3-13
Partial cystectomy confers a survival advantage over radical cystectomy for those patients with stage II or higher adenocarcinoma bladder cancer

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Introduction: Adenocarcinoma bladder cancer can be difficult to treat due to lack of recommendations and literature based on only small case series. The objective of this study was to analyze various treatment approaches to this non-urothelial histologic variant and assess for difference in patient outcomes.
Methods: Cases were identified from the National Cancer Database (NCDB) Participant User File (PUF) for bladder cancer from 2004–2015. Patients were selected by histology corresponding to adenocarcinoma variants, with 3992 patients identified. Trends in primary surgical treatment were analyzed by analytic stage and over time. Kaplan-Meier curves and log rank-tests were used to characterize survival.
Results: Analysis of surgical approach by stage for patients with adenocarcinoma bladder cancer revealed a statistically significant survival benefit for those patients treated with partial cystectomy.
Conclusions: The data from this study suggest that patients with adenocarcinoma type bladder cancer should be treated with partial cystectomy, rather than radical, as this confers a significant survival advantage.

MP3-14
Spontaneously shrinking papillary renal cell carcinoma — an immunologic phenomenon?

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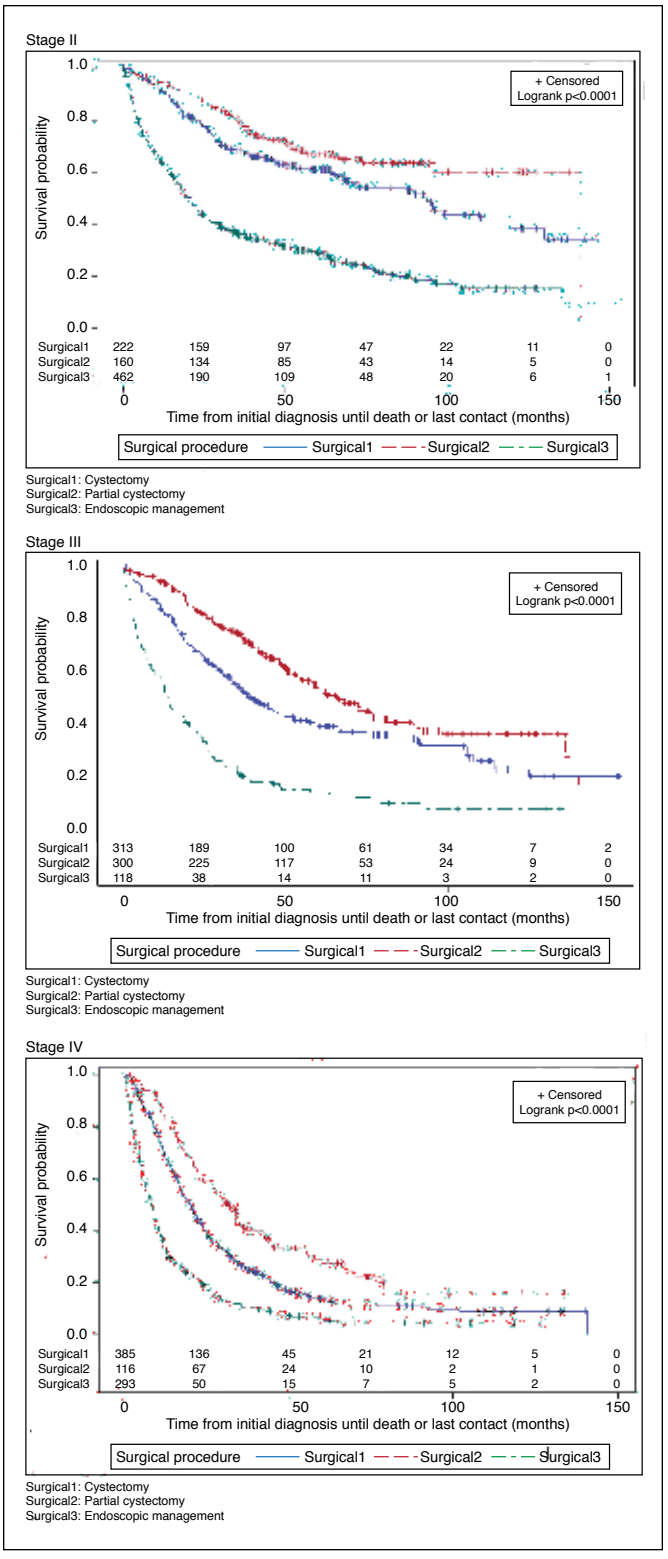
Introduction: While many small renal masses (SRM) grow slowly under active surveillance (AS), a subset appear to shrink. The histology of these shrinking tumors is unknown because of lack of widespread use of SRM biopsies. The growth kinetics of papillary renal cell carcinoma (pRCC) tumors on AS are also unknown for the same reason. Here, we describe the tumor growth kinetics of AS patients with biopsy histology favoring pRCC.
Methods: A prospectively maintained kidney tumor AS database at a single National Comprehensive Cancer Network institute was queried to identify all patients with pRCC diagnosis by percutaneous needle core biopsy and at least 6 months followup on AS. Patient clinical features and tumor kinetics were retrospectively studied. Tumor volume (cubic centimeters, cc) was calculated using cross-sectional imaging as 4/3 x 3.14 x (0.5 x [length][width][height]). Needle core biopsies were re-reviewed by a single genitourinary pathologist and scored for presence of lymphocytes, macrophages, eosinophilia, and necrosis.
Results: A total of 22 AS patients were identified with pRCC diagnosis based on percutaneous biopsy. Most patients had pRCC type 1 (n=16, 73%) and the remainder had type 2, mixed type 1 and 2, or type unspecified (n=6, 27%). Median patient age was 70 years (range 52–85). Median largest tumor diameter at AS initiation was 3.2 cm (range 1.8–9.0). Median followup interval was 19.2 months (range 6.2–25.6), during which 9 patients (45%) progressed to treatment. Intriguingly, 8/22 (36%) tumors shrunk during AS without any treatment. The range of tumor volume shrinkage was 40–72%, with median and mean volume reduction of 50% and 54%, respectively. 7/8 (88%) of these tumors were shrinking at the time of biopsy, and 6/8 (75%) had biopsy slides available for re-review.



MP3-13. Fig. 1. Product-limit survival estimates with number of subjects at risk.

Biopsy slides of 6/6 (100%) shrinking tumors demonstrated at least focal amounts of infiltrating macrophages, which were extensive in 4/6 (67%) cases and at least moderate in 5/6 (83%) cases. In comparison, only 6/14 non-shrinking tumors (43%, p=0.04) had at least focal amounts of infiltrating macrophages, which were extensive in 2/14 (14%; p=0.03) cases and at least moderate in 5/14 (36%; p=0.14) cases.
Conclusions: In the largest pRCC AS patient series to our knowledge, we discovered a previously undescribed phenomenon of pRCC shrinkage, which is characterized by common macrophage infiltration of tumors. The degree of macrophage infiltration may serve as a powerful biomarker, helping predict tumor growth and identify ideal candidates for AS. Further studies are underway to better characterize the incidence, duration, and mechanisms responsible for tumor shrinkage.

MP3-15
Quality improvement for venous thromboembolism in urologic surgery

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Introduction: Venous thromboembolism (VTE) is comprised of deep vein thrombosis (DVT) and pulmonary embolism (PE), and is a common cause of morbidity and mortality in urologic surgery. Appropriate risk stratification and administration of prophylaxis can help reduce VTE-related complications. The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) is a nationally validated, risk-adjusted, outcomes-based program. We used this database to catalogue and improve our VTE rate.
Methods: We retrospectively reviewed data from the NSQIP database from January 1, 2010 to December 31, 2016, including 605 urology operations at Albany Medical Center. A total of 11 patients were identified to have a VTE occurrence within 30 days of undergoing urologic surgery. We identified that the intended chemical VTE prophylaxis to be administered on the day of operation was being postponed to postoperative day 1. This policy was revised in January 2017. Subsequently, 200 cases were reviewed. Analysis included demographic and lifestyle information, medical comorbidities, procedure performed, operative time, VTE risk, prophylaxis administered, and significant postoperative events.
Results: The mean age of patients with VTE was 61.5 years (range 50–79). 10 of 11 cases were patients undergoing surgery for cancer. Our institution's postoperative PE rate was 1.40% compared to 0.50% nationally from 2010–2016. For 2015 alone, our PE rate was 3.2% compared to 0.5% nationally, and DVT rate was 3.2% vs. 0.8% nationally. Following revision of prophylaxis administration policy in January 2017, our incidence of VTE has been only 2 events in 200 cases, or 1%.
Conclusions: We believe VTE is preventable in most cases and the postoperative occurrence rate should be low. In quality review, it is important to consider all possible sources of error. Although prophylaxis may have been ordered appropriately, it is essential to verify what the patient received. After an institutional policy change, we have seen a reduction in our VTE rate to nationally accepted standards.

MP3-16
Spectrum bias in the evaluation of hematuria

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Introduction: American Urological Association guidelines recommend that all patients presenting with hematuria undergo computed tomography urography (CTU), regardless of the extent of hematuria. Based on the rationale that the risk of a urologic malignancy varies depending on the severity of hematuria, we explored the association between the degree of hematuria and the diagnostic yield of CTU.
Methods: We performed a systematic review and meta-analysis of studies reporting the proportion of patients diagnosed with urologic malignancies following presentation with hematuria. We operationalized the degree of hematuria as "microscopic," "gross," or "unspecified." We considered

the diagnostic yield of CTU on the basis of the number of patients diagnosed with each of three urologic malignancies with known associations with hematuria (bladder cancer, upper tract urothelial carcinoma, and renal cancer) among all patients undergoing imaging for hematuria. We pooled the diagnostic yield for each diagnosis stratified according to the degree of hematuria (micro, gross, or unspecified) using random effects meta-analysis and performed pairwise comparison according to severity of hematuria for each diagnosis (reported as the difference in pooled diagnostic yields with 99% confidence intervals).

Results: Among 3983 unique references retrieved, 25 studies were selected for inclusion. For each outcome, rates of cancer diagnosis were lowest among patients with microscopic hematuria. Assessing bladder cancer, the diagnostic yield of axial imaging differed depending on the degree of hematuria, with a significant difference between patients with gross vs. microscopic hematuria (difference in pooled rates 17.3%; 99% CI 7.7–27.0) and unspecified vs. microscopic hematuria (difference in pooled rates 9.8%; 99% CI 0.1–19.4). Similarly, significantly differential rates in diagnosis of upper tract urothelial carcinoma were identified for patients with unspecified vs. gross hematuria (difference in pooled rates 6.0%; 99% CI 1.7–10.4) and for patients with unspecified vs. microscopic hematuria (difference in pooled rates 7.1%; 99% CI 2.9–11.3). Finally, for renal cancer, a significant difference in rates was identified for patients with unspecified vs. microscopic hematuria (difference in pooled rates 15.7%; 99% CI 4.2–27.2).

Conclusions: The diagnostic yield of CTU in patients presenting with hematuria varies significantly based on the severity of hematuria. Given the risk of ionizing radiation, alternative imaging strategies may be warranted for patients with microscopic hematuria.

M3-P17

Is there a gender difference in bladder tumor RNA signature?

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Introduction: Bladder cancer diagnoses requires cystoscopy for detection. In the absence of an accurate non-invasive screening test for diagnosis of de novo and recurrent tumors, bladder cancer will remain one of the most expensive malignancies to manage. We developed a non-invasive test that interrogates small non-coding RNAs (sncRNAs) present in urinary exosomes. Analyzing the urine exosome data with a novel statistical classification algorithm provides a platform that unequivocally differentiates between patients with and without bladder tumors. Furthermore, a difference in RNA signatures between genders was illustrated.

Methods: Urine samples were collected from patients presenting to our clinic for cystoscopy, either as part of a hematuria workup or surveillance. Patients without a tumor on cystoscopy served as the control cohort and were compared to those with a tumor. A sncRNA signature specific for bladder cancer was generated from urine exosomal RNAs. A high throughput platform, customized to interrogate the most informative sncRNAs, was then used to screen urine exosomal RNA derived from patients with tumor on cystoscopy. Data were then analyzed using a statistical classification algorithm that provides a bladder cancer score. This novel analytical approach requires no a priori knowledge of the sncRNA function to generate an unbiased segregation into those with and without tumor.

Results: Bladder tumor patients have significantly elevated levels of total exosomal RNA relative to our control cohort. In total, 18 patients had a bladder tumor and 61 did not and served as controls, where 55% and 57% were male, respectively. Age of controls and study cohort was 62.1±13.1 and 71.6±13.3 years, respectively. Approximately, 150 sequences were identified as being informative and they differed between males and females. These were then used to develop the bladder cancer score. Comparison of the bladder cancer score to the results of cystoscopy established that the bladder cancer score correctly identified patients with tumor with no false negatives and two false positives, to a 95% confidence interval.

Conclusions: Implementation of the bladder cancer score as a screen for patients with suspected bladder cancer provides a non-invasive alternative to cystoscopy for monitoring disease, and can readily be deployed in the clinic to reduce the number of screening cystoscopies needed. The differences noted between male and female signature sequences may also be of clinical relevance.

Moderated Poster Session 4: Female Urology/Incontinence, Infertility/Impotence/General Urology

Moderators: Yonah Krakowsky, MD, University of Toronto; Steven Steele, MD, Queen's University

MP4-01

Postoperative analgesic requirements in endoscopic ambulatory surgery patients following belladonna and opium suppository administration

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Introduction: The belladonna and opium (B&O) rectal suppository functions as a pelvic floor analgesic and antispasmodic. While its use is widespread in the urologic community, there are few studies examining the efficacy of B&O suppository administration to reduce postoperative analgesic requirements in patients following endoscopic intervention. The purpose of this study was to determine whether a B&O suppository administered postoperatively in endoscopic ambulatory surgery patients would be associated with reduced analgesic requirements in the immediate postoperative setting.

Methods: A retrospective review of patients that underwent ureteroscopic intervention for stone disease at a local hospital from February to April, 2018 was performed. Postoperative analgesic requirements were reviewed. Statistical analysis was performed using the Chi-square test and Mann-Whitney U test.

Results: 44 patients underwent ambulatory ureteroscopic intervention for stone disease. Postoperatively, 22 (50%) patients received a B&O suppository. Patient demographic information was similar between the group that received a B&O suppository and those that did not (Table 1). As demonstrated in Fig. 1, median postoperative intravenous hydromorphone administration was significantly less in the group that received a B&O suppository compared to those that did not receive a B&O suppository (0 mg vs. 1 mg, respectively; p=0.022). No adverse effects secondary to B&O administration were identified.

Conclusions: Immediate postoperative administration of a B&O rectal suppository following ureteroscopic intervention is associated with reduced intravenous analgesic consumption.

MP4-01. Table 1. Patient demographics by treatment group

Patient demographics	Without B&O (n=22)	With B&O (n=22)	p
Age, yrs, median (range)	63 (29–81)	62 (18–83)	0.407
Female, n	13	11	0.545
Male, n	9	11	
ASA classification, median (range)	2.5 (1–4)	2 (1–4)	0.939
Procedure type			
Flexible ureteroscopy, n	13	13	1
Rigid ureteroscopy, n	9	9	
Intraoperative toradol, n	8	8	1

MP4-02

Dorsal onlay buccal mucosa graft in repair of radiated vesicourethral anastomotic strictures

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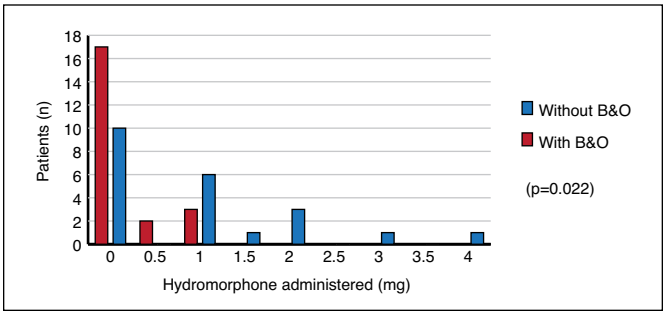
Introduction: Radiated vesicourethral anastomotic strictures combine the challenge of bladder neck dissection with the fear of poor healing due to radiation. As a result, many reported repairs describe complex abdominal and perineal approaches with high rates of complications and stricture recurrence. We propose the use of dorsal onlay buccal mucosa graft in repair of radiated urethrovesical anastomotic stricture as a less invasive, safe, and durable method of repair.

Methods: We retrospectively reviewed the records of all patients at our institution who underwent urethroplasty with buccal mucosa graft for vesicourethral anastomotic stricture after radiation. In all cases, urethroplasty was performed via perineal approach using Kulkarni-type one-sided urethral dissection, dorsal urethrotomy, and dorsal buccal mucosa only. Stricture recurrence was determined by uroflowmetry and patient reported symptoms. Continence was evaluated pre- and postoperatively.

Results: We identified 5 male patients with history of prostatectomy and external beam radiotherapy who presented with vesicourethral anastomotic stricture and underwent urethroplasty with buccal mucosa graft. Mean age was 63 years (51–70). Mean followup time was 17 months (5–27). Mean stricture length was 5 cm (3–8). Mean number of previous endoscopic interventions was 1 (0–2). Mean preoperative peak flow was 12 mL/second (5–19). Mean postoperative peak flow was 22 mL/second (16–24). All 5 patients report satisfactory urinary flow with minimal change in their postoperative peak flow. One patient developed stricture recurrence that was treated endoscopically. All 5 patients underwent cystoscopy postoperatively, which revealed viable buccal mucosa. Four patients reported incontinence preoperatively. Three of these patients subsequently underwent artificial urinary sphincter placement and reported regaining continence. One patient reported continence preoperatively and retained continence postoperatively.

Conclusions: We present an effective method of repair of vesicourethral anastomotic strictures with minimal complications. Buccal mucosa is a durable graft material in this setting with acceptable outcomes. Longer followup time and larger sample size are needed to evaluate long-term outcomes.



MP4-01. Fig. 1. Postoperative hydromorphone administration by treatment group.

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MP4-03

Defining hypogonadism using 3 different total testosterone cut points resulted in similarly improved post-clomiphene citrate semen analysis parameters in men with unexplained infertility.

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Introduction: Infertility is a distressing problem for many couples. It has been established that male factor infertility is the sole factor for infertility in at least 20–30% of couples.[1] The use of clomiphene citrate (CC) has been shown to positively influence semen sperm concentration[2] for those with unexplained infertility associated with hypogonadism. Unfortunately, the cut point for defining hypogonadism has not been defined for infertile men and is, therefore, provider-dependent with a total testosterone (TT) cut point of 264, 300, and 400 ng/dL all being used. Our hypothesis was that men with the lowest TT (264 or lower) would have the greatest improvement in both post-CC semen analysis (SA) and TT.

Methods: An IRB-approved chart review of 45 consecutive male patients presenting for infertility evaluation over a 12-month period was performed. All clients received CC (50 mg daily) to treat their unexplained infertility. We excluded patients with a baseline TT >400 ng/dL, lacking post-CC labs (SA or TT), or who received letrozole. 17 patients were evaluated with 6, 5, and 6 patients in the <265, 265–300, and 301–400 ng/dL groups, respectively. Paried t-tests were done to evaluate the differences in SA and TT pre- and post-CC treatment. A one-way ANOVA was performed to evaluate the difference between the three testosterone cut point groups in their post-CC treatment change in SA parameters (concentration and motility) and total testosterone.

Results: Although there was an increase in post-CC mean sperm concentration (53%; $p<0.05$) and motility (23%; $p<0.05$), there was no significant difference noted on ANOVA between the three total testosterone subgroups ($p=0.514$ and $p=0.3076$, respectively). On the other hand, for the post-CC TT, there was a significant difference between the three total testosterone subgroups ($p=0.0234$) with the greatest improvement in the 301–400 ng/dL group (201%; $p=0.0046$) and trending for the <264 ng/dL group (137%; $p=0.0557$).

Conclusions: For men with unexplained infertility, three TT cut points defining hypogonadism had a similarly improved sperm concentration and motility after CC treatment. Furthermore, the most robust TT response was seen in patients with a higher baseline TT of 301–400 ng/dL. Future studies should include a larger cohort, including a review of post-CC pregnancy and live birth rates.

References:
1. Khourdaji I, Lee H, Smith RP. Frontiers in hormone therapy for male infertility. *Transl Androl Urol* 2018;7(Suppl 3):S353-66. https://doi.org/10.21037/tau.2018.04.03
2. Bridges N, Trofimenko V, Fields S, et al. Male factor infertility and clomiphene citrate: A meta-analysis — the effect of clomiphene citrate on oligospermia. *Urol Pract* 2015;2:199-205. https://doi.org/10.1016/j.urpr.2014.10.007

MP4-04

Impact of fellowship training on hospital discharge data for women undergoing urinary incontinence procedures.

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Introduction: Urinary incontinence is a prevalent condition that is becoming recognized in more women regardless of the presence of traditional risk factors. Female pelvic medicine and reconstructive surgery (FPMRS) is a subspecialty of urologists and gynecologists with expertise in the management of pelvic floor disorders, including refractory incontinence. We hypothesized that patients hospitalized after incontinence procedures would have different characteristics based on the level of training of their surgeon. FPMRS surgeons may treat more complex patients in metropolitan areas and this may be associated with higher costs.

Methods: New York State Statewide Planning and Research Cooperative System (SPARCS) inpatient de-identified datasets were queried for women who underwent genitourinary incontinence procedures from 2009–2016. Descriptive statistics using Chi-square tests were performed to compare FPMRS-trained surgeons to non-FPMRS surgeons. Age, race, length of stay (LOS), severity of illness (major, moderate, mild), hospital service area, and cost were assessed.

Results: 1641 women met inclusion criteria. Patients undergoing incontinence procedures did not differ by age ($p=0.545$), however, they did differ by race ($p=0.001$), with FPMRS surgeons operating on more black women (10.3%) and fewer white women (67.0%) compared to non-fellowship trained surgeons (8.2%,75.0%). LOS did not differ between groups ($p=0.276$). Severity of patient illness did not differ significantly based on training ($p=0.193$), however, 31.0% of moderately complex patients were operated on by FPMRS-trained providers compared to 27.6% in the non-FPMRS group. Fellowship-trained surgeons concentrated near large cities, with 68.3% of all incontinence procedures in Manhattan performed by FPMRS-trained surgeons, vs. 39.6% in the Finger Lakes region or 4.5% in Western NY, for instance. Finally, cost differed significantly between groups ($p=0.000$), with 75.1% of non-FPMRS surgeons having total costs under $7500 vs. 53.7% under such cost in the FPMRS-trained group. Insurance payer did not differ by provider type ($p=0.157$).

Conclusions: FPMRS training did appear to lend itself to occupational preference in academic centers located in metropolitan areas. They treated a more diverse demographic of patients, but insurance type did not differ. Cost was expectedly higher, however, this was not influenced by age or reported severity of illness, nor was it explained by longer hospital stays. More work is needed to determine the clinical and economic impact of these data, particularly in regard to patient outcomes and the need for reoperation.

MP4-05

Outcomes of a fragile urethra in men with multiple artificial urinary sphincter revisions

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Introduction: The artificial urinary sphincter is an option for men who have severe urinary incontinence. AUS devices carry a high complication rate that may require removal and replacement of the device. Urethral risk factors, such as radiation and prior erosion and cuff size, can increase this risk. Men who have required multiple revisions have not been studied. The aim of this study was to evaluate the causes of multiple AUS revisions.

Methods: This is a multi-institutional, retrospective review of all patients undergoing AUS placement from 2000–2017. Revisions for devices who had erosions and/or infections were identified and these patients were included in our analysis. Demographics and baseline characteristics were obtained. Patients who had subsequent erosions/infection of AUS device were compared to those who did not.

Results: 35 patients who underwent AUS revisions were identified. Mean age at time of initial AUS was 73 years (54–94). 23 patients had a history of prostate cancer and 9 patients were treated for bladder cancer. 13 patients received external radiation. The most common etiology was prostatectomy (40%), followed by cystoprostatectomy (26%), TURP (11%), TURBN (9%), and trauma (9%). 6 patients underwent prior anti-SUI surgery. 29% of patients had diabetes, 63% hypertension, and 26% CAD. The mean BMI was 27.7 (19.9–35.8). All patients had erosion and 86% of those had infection as well. The average time to the first removal was 41 months (0.5–223). 23 (66%) patients underwent a second revision and replacement of AUS. Of those, 9 (39%) had subsequent erosions and/or infections requiring further revision or removal. Those who required further revisions were found to be more likely hypertensive ($p=0.049$) and had higher BMI ($p=0.012$). Age, prostate cancer status, bladder cancer status, history of radiation, etiology of SUI, previous anti-SUI surgeries, DM, and CVD were found to be not clinically significant. There was also no difference in initial cuff size or time to erosion/infection.

Conclusions: In men with previous revisions for AUS cuff erosion and infection, hypertension and obesity correlated with further failures and revisions. History of radiation and cuff size were not found to be significant. There is a higher rate of re-revision than primary AUS in these patients.

MP4-06

UroLume removal, urethral preservation, and dorsal onlay buccal mucosa graft urethroplasty for recurrent urethral stricture: A multi-institutional experience

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Introduction: We aimed to describe a multi-institutional experience in the removal of urethral stents (UroLume™) with urethral preservation and urethroplasty using dorsal buccal mucosa graft (BMG) onlay for repair of recurrent urethral stricture.

Methods: A retrospective, multi-institutional chart review was performed on patients who required urethral reconstruction involving the removal of a UroLume stent. All patients had undergone a dorsal onlay urethroplasty with BMG as described by Kulkarni or Barbagli, with the inclusion of a tine-by-tine urethral stent removal in a urethral preserving fashion via the dorsal urethrotomy. We excluded those who had prior urethroplasty or a different brand of urethral stent. Age, symptoms leading to surgery, location and number of stents, stricture length, length of followup, need for additional procedures, change in voiding parameters, and international prostate symptom score (IPSS) and quality of life scores were analyzed.

Results: 18 men with a mean age 63 years (range 36–76) who underwent urethral stent removal and dorsal onlay urethroplasty were included in the study. The symptoms in patients presenting for UroLume removal were recurrent urethral stricture in 14 (78%) patients, stent-associated pain in 8 (44%), and recurrent UTIs in 7 (39%). 16 patients had a single bulbar urethral stent and 2 patients had tandem double stents at a bulbar and membranous urethral location. Mean stricture length was 4.7 cm (range 3–11). At a mean followup of 41.4 months (range 6–187), no patient required an additional procedure for stricture recurrence. Significant improvement ($p<0.001$) was observed with respect to mean maximum flow rate (4 to 19 cc/sec), post-void residual (240 to 32 cc), IPSS (28 to 12), and quality of life score (5 to 1).

Conclusions: Urethral strictures associated with prior urethral stent placement can be effectively treated using dorsal approach for stent wire removal, urethral preservation, and urethroplasty with dorsal BMG onlay technique. Advantages of the approach include urethral preservation, versatility enabling treatment of any length of defect in any urethral location, and reproducibility.

MP4-07

Urodynamic findings of outlet obstruction in women with pelvic organ prolapse

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Introduction: Prevalence of pelvic organ prolapse is a common finding in women who have undergone childbirth, approaching 50% on physical examination in epidemiologic studies. The pelvic organ prolapse quantification system (POP Q) was developed in 1996, and has become the most widely used staging system for pelvic organ prolapse in urogynecologic literature, with greater than 60% of urologists adopting the system as of 2015. Previous studies have demonstrated increased incidences of urethral obstruction and occult detrusor overactivity in patients with higher degrees of prolapse, though never in combination with POP Q definitions. We aimed to evaluate for evidence of outlet obstruction on urodynamic testing (UDS) based on grade of prolapse as defined by POP Q score.

Methods: We reviewed all UDS reports between January 1, 2015 and December 31, 2017 by one of two providers who perform prolapse repair procedures. We identified female patients who were seen for complaint of symptomatic pelvic organ prolapse based on provider documentation and POP Q score. Patients seen for other diagnosis or with incomplete data were excluded. Data obtained from chart review included age, BMI, previous pelvic surgery, number of vaginal deliveries, diagnosis of diabetes mellitus, POP Q score, and UDS results. Outlet obstruction was defined using the bladder outlet obstruction index (BOOI). Chi-square analysis and two-sided t test were used to compare groups with significance at $p<0.05$.

Results: A total of 69 women met criteria for inclusion; 37 with stage 1 or 2 prolapse and 32 with stage 3 or 4 prolapse. Mean age was 62 for stage 1–2 group (range 42–86) and 67 for stage 3–4 group (range 41–91) ($p=0.053$). Average BMI was 29 in both groups. UDS was done both with and without pessary reduction of prolapse. Average post-void residual did not vary significantly in either non-reduced or reduced states ($p=0.22$, 0.48). Parity, proportion of patients with previous pelvic surgery, diabetes diagnosis, detrusor voiding pressures, detrusor overactivity on UDS, or stress incontinence on UDS did not vary significantly. Only one woman, who had stage 2 prolapse, met criteria for obstruction based on BOOI. Three were equivocal, and had stages 2, 3, and 4 prolapse.

Conclusions: Detrusor voiding pressures and post-void residuals were similar in patients with stages 1 and 2 prolapse when compared to patients with stage 3 and 4 prolapse. Higher stage of prolapse did not correlate with increased bladder outlet obstruction in either non-reduced or reduced states. These findings challenge previously held notions regarding the effects of prolapse on bladder emptying.

MP4-08

Long-term outcomes of sacral neuromodulation: 23-year experience

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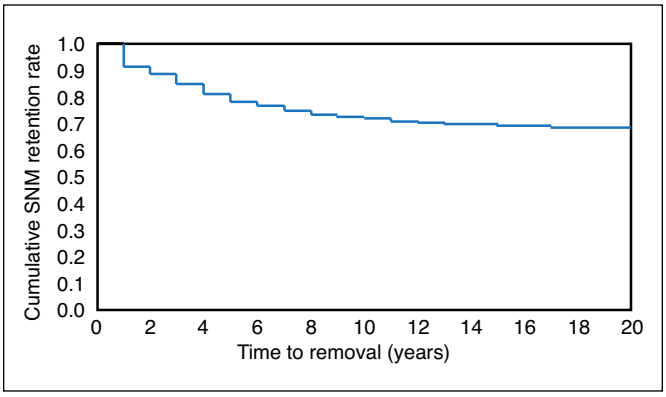
Introduction: Sacral neuromodulation (SNM) has been found effective for the treatment of "dry and wet" overactive bladder (OAB), bladder pain syndrome/interstitial cystitis (BPS/IC), and voiding dysfunction (VD). Our department was one of the first two in Canada that started SNM treatment in 1994. Several studies show the safety and efficacy of SNM at short- and medium-term followup. 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 lower urinary tract symptoms and voiding lower urinary tract



MP4-08. Fig. 1. Kaplan-Meier SNM retention plot.

symptoms. Secondary outcomes included number of revisions, reason for revision, complications, and rate of device removal.
Results: A total of 434 patients were included, with 373 (86%) female and 61 (14%) male patients. All patients underwent test phase and 241/434 (55%) patients eventually received a SNM implant. Mean age at time of implant was 49 years. Of the patients that received SNM implant, 118 (49%) had a diagnosis of BPS/IC, 24/241 (10%) with VD, 86/241 (36%) with OAB, and 13/241 (5%) with neurogenic lower urinary tract dysfunction (NLUTD). Mean followup time was 5.8 years (1 month–20.5 years). 76/241 (32%) devices were removed due to device failure or complication. 167/241 (69%) patients underwent at least one followup surgical revision, with routine battery or lead change being the most common procedure. The mean percentage improvement in symptoms on the last followup (mean 6.4 years) for patients with successful SNM was 69%. At the end of data collection, 166/241 (69%) devices remained in situ, with ongoing followup (Fig. 1).
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.

MP4-09
Predictors of revision surgery for penile prostheses: A high-volume, single-surgeon series

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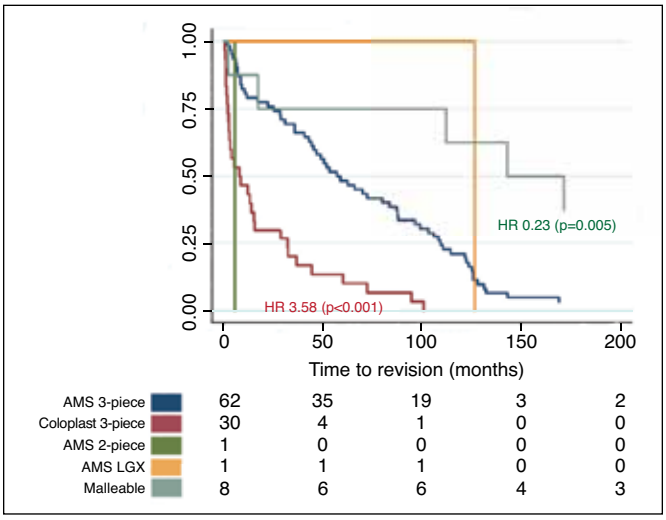
Western University

Introduction: Penile prosthesis (PP) implantation is the standard of care for men with erectile dysfunction refractory to medical management. Revision surgery for PP is necessary in up to 40% of cases over 15 years. This study aims to review the largest to date Canadian series of penile implant revisions performed by a single surgeon to identify patient, device, and intraoperative factors that are associated with need for revision surgery.
Methods: A retrospective review was performed for all patients who underwent first-time revision surgery for PP at our institution from 2006–2018. All revision surgeries were performed by a single surgeon at a tertiary care center. Patient characteristics, device factors, and intraoperative variables previously identified to be associated with revision surgery were collected and analyzed.
Results: During our study period, 980 penile prostheses were implanted and 112 revision surgeries (12.6%) were performed. Mean time to revision was 75.6 months. Revision surgeries were most commonly performed for mechanical failure (53.6%), followed by erosion (9.8%) and pain (9.8%). Infection accounted for 6.3% of revisions and 0.8% of primary implants. On multivariate analysis, patients with history of coronary artery disease (CAD) (OR 7.46; p=0.04) and immunosuppression (OR 11.32; p=0.02) were more likely to have PP infection and patients with longer surgeries had higher risk of erosion (OR 1.04; p=0.04). Implantation of Coloplast 3-piece PP was predictive of need for revision surgery (p<0.001), whereas malleable PP was protective of need for revision surgery (p=0.005) (Fig. 1).
Conclusions: Patients who undergo penile prosthesis implantation are at risk for requiring revision surgery. Risk factors for reoperation may include history of CAD, immunosuppression, length of procedure, and type of device. Patients at risk for requiring revision surgery should be identified, informed, and followed accordingly. The incidence of PP infection in our sample was lower than previously described rates. We believe this is explained by the high-volume, single-surgeon nature of this series and the specialized care for patients undergoing PP surgery provided at our institution.



MP4-09. Fig. 1. Kaplan-Meier survival analysis of penile prosthesis by device type.

MP4-10
Trends in the usage of contrast allergy prophylaxis for endourologic procedures

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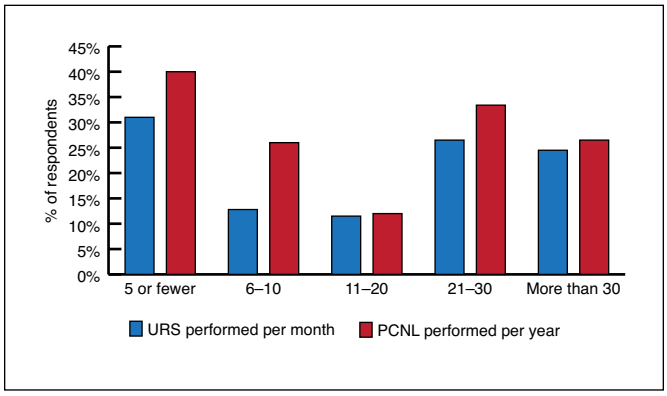
Introduction: The use of a prophylaxis regimen in patients with an intravenous (IV) contrast allergy prior to IV contrast administration for imaging studies is well-established. Conversely, there is little evidence on giving these patients prophylaxis prior to administration of contrast directly into the urinary tract. We aimed to characterize current practice patterns by urologists in the management of IV contrast allergy in the setting of endourologic procedures.
Methods: A survey was administered to all members of the Endourological Society to assess management of IV contrast allergy prior to ureteroscopy (URS) and percutaneous nephrolithotomy (PCNL). Treatment regimens, reports of adverse outcomes, and demographics of respondents were also collected. Data were analyzed using Chi-square tests.
Results: The response rate was 15% (325/2100). 21% and 28% of respondents reported giving prophylaxis prior to URS and PCNL, respectively. Approximately half reported giving prophylaxis only one hour prior to the procedure. Most respondents (77%) completed a fellowship, the most common being endourology. Chi-square analysis revealed a significant difference between giving prophylaxis for URS or PCNL and the respective case volumes (for URS X^2=8.3, p=0.004; for PCNL, X^2=8.5, p=0.003) where urologists with the lowest and highest case volumes were more likely to give prophylaxis (Fig. 1). There was no significant difference between giving prophylaxis for URS or PCNL and recency of residency, fellowship training, practice setting, or practice type.
Conclusions: Many urologists give prophylaxis for patients with IV contrast allergy prior to URS and PCNL. Further studies are needed to evaluate the necessity of prophylaxis, as well as to establish clear guidelines.



MP4-10. Fig. 1. Respondents giving prophylaxis by case volume.

MP4-10. Table 1. Respondent training and practice characteristics

Variable	Respondents
Residency time frame	
0–5 years ago	42 (14%)
6–10 years ago	68 (23%)
10 or more years ago	186 (63%)
Completed fellowship	224 (77%)
Endourology	194 (87%)
Oncology	11 (5%)
Reconstructive	3 (1%)
Transplant	3 (1%)
Research	2 (1%)
Other	10 (4%)
Fellowship time frame	
0–5 years ago	50 (23%)
6–10 years ago	63 (28%)
10 or more years ago	109 (49%)
Practice type	
Academic	183 (62%)
Non-academic hospital-based	56 (19%)
Private practice	55 (19%)
Practice surroundings	
Metropolitan	246 (84%)
Non-metropolitan	47 (16%)
URS performed per month	
5 or fewer	16 (5%)
6–10	78 (26%)
11–20	111 (38%)
21–30	49 (17%)
More than 30	41 (14%)
PCNL performed per year	
5 or fewer	50 (17%)
6–10	46 (16%)
11–20	58 (20%)
21–30	39 (13%)
More than 30	102 (35%)

MP4-11

Incidence and surgical management of concurrent adult acquired buried penis and urethral stricture disease

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Introduction: To describe the incidence and surgical management of coexistent adult acquired buried penis (AABP) and urethral stricture disease. AABP patients often have urinary dribbling with resultant chronic local moisture, infection, and inflammation that combine to cause urethral stricture disease. To date, no screening or surgical management algorithms have been described.

Methods: A multi-institutional, retrospective study was conducted of the surgical management strategies for patients with concurrent AABP and urethral stricture disease from 2010–2017. AABP patient demographics, physical exam findings, and comorbidities were compared between those with and without stricture disease to suggest those that would selectively benefit from screening for stricture disease.

MP4-10. Table 2. Respondent practices for contrast allergy pre-medication

Variable	Respondents	
	URS	PCNL
Respondents who pre-medicate (n=326)	67 (21%)	86 (28%)
Pre-medicate for what degree of contrast allergy? (n=55)		
Mild	23 (42%)	29 (36%)
Moderate	39 (71%)	60 (75%)
Severe	39 (71%)	64 (80%)
Pre-medication protocol used (n=55)		
1 hour	30 (55%)	39 (49%)
4 hour	9 (16%)	15 (19%)
13 hour	19 (35%)	29 (36%)
Witnessed allergic reaction to GU contrast procedure? (n=285)		
Mild	17 (6%)	17 (6%)
Moderate	15 (5%)	16 (6%)
Severe	5 (2%)	7 (3%)

Results: Of 42 patients surgically managed for AABP, 13 had urethral stricture disease (31.0%). Stricture location was universally in the anterior urethra. 61 (n=8) percent of strictures were 6 cm or longer and managed prior to AABP repair with Kulkarni urethroplasty. Patients with urethral stricture disease were significantly more likely to have clinically diagnosed lichen sclerosus (p=0.00019). There was no significant difference in BMI, age, or comorbidities between patients with and without urethral stricture disease.

Conclusions: Extensive anterior urethral stricture is common in patients with AABP. Clinical characteristics cannot predict stricture presence except possibly the presence of lichen sclerosus. Definitive stricture surgical options include extensive Johanson urethroplasty or Kulkarni urethroplasty. Kulkarni urethroplasty prior to AABP repair has the benefits

MP4-11. Table 1. Adult acquired buried penis stricture length, location, and surgical management

AABP-urethral stricture characteristics and management

Stricture location	Stricture length (cm)	Surgical management	Stricture management (compared to timing of AABP repair)
Penile	6	Kulkarni	Preop
Penile/meatal	12	Dilation	Preop
Penile	7	Kulkarni	Preop
Penile	3	1st stage Johanson	Simultaneous
Penile/meatal	13	Kulkarni	Preop
Distal penile	2	1st stage Johanson	Postop
Distal penile	2	Dilation	Simultaneous
Penile/bulbar	6	Kulkarni	Preop
Distal penile	2	1st stage Johanson	Simultaneous
Meatal	2	Dilation	Simultaneous
Penile	10	Kulkarni	Preop
Penile	6	Kulkarni	Preop
Penile/meatal	5	1st stage Johanson	Simultaneous

MP4-11. Table 2. AABP patient demographics, comorbidities, and physical exam findings with and without urethral stricture disease

	AABP	AABP & Stricture	p
Age (yr)	53.7	49.7	0.21
BMI (kg/m^2)	43.6	42.6	0.34
Lichen sclerosus (%)	71.4	17.2	**0.00019**
Comorbidites (%)			
OSA	38	38.5	0.49
DM	51.7	46.2	0.37
HTN	68.9	46.2	0.095

of a single-stage repair, good cosmetic outcome with meatal voiding, and dorsal graft placement to allow safe degloving of the penis in the subsequent AABP repair.

MP4-12

Stones, space, and Dr. Abraham T.K. Cockett: A history of urolithiasis and aerospace medicine

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Introduction: Homo sapiens have suffered from stone disease since ancient times, with the earliest evidence dating to the Stone Age (Mesolithic period). The history of urolithiasis has been documented on multiple continents with equal gender distribution. The once constant variable of gravity has now changed in the events of space travel beginning in the 20th century and has become a large contributing factor to the milieu effecting stone disease among astronauts. Abraham T.K. Cockett (1928–2011) was the former Chief of Experimental Surgery at the School of Aerospace Medicine during the John F. Kennedy presidential administration during the "space race" period of the 1960s.
Methods: The history of urolithiasis and aerospace medicine was reviewed with the assistance of the National Aeronautics and Space Administration (NASA) Historical Society and images were provided by the NASA Office of Communications, with searches performed through the NASA Historical Reference Collection and Technical Reports Server (NTRS). A PubMed database literature search was performed for Dr. Abraham T.K. Cockett from 1950–2011 and further historical information pertaining to his personal and professional life were obtained from the University of Rochester Department of Urology.
Results: Articles identified pertaining to aerospace medicine were examined in detail. Press releases, mission transcripts, speeches, and research manuscripts were organized for a coherent recognition of Dr. Cockett's work in the cultural setting of the "space race" during the Kennedy administration.
Conclusions: Urolithiasis accounts for a significant amount of pathology in astronauts from the beginning of the space program and will likely continue as a significant issue in future space travel by mechanisms distinctly postulated and described by Dr. Cockett.

MP4-13

Complete Y chromosome microdeletion: A case report and review of the literature

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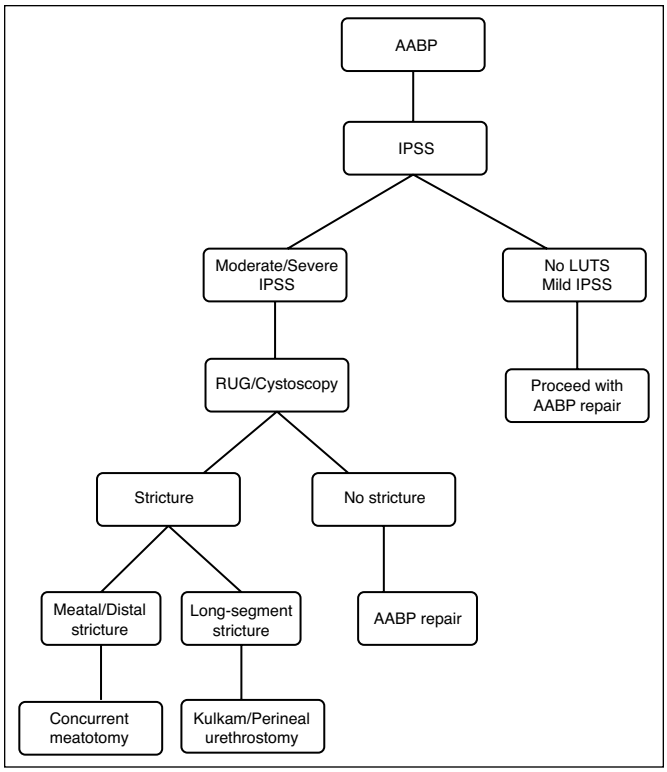
Introduction: Males presenting for male factor infertility evaluation that are found to have primary hypogonadism and subsequent azoospermia on semen analysis undergo genetic evaluation in standard practice. On rare occasion, a phenotypic male with sex determining region Y (SRY) negative 46, XX testicular disorder of sex development (DSD) may be observed. This is usually recognized early in life with hypospadias, cryptorchidism, or ambiguous genitalia. We present a case report of an adult phenotypic male with azoospermia found to have complete Y chromosome microdeletion with SRY negative 46, XX testicular DSD and review of the current literature.
Methods: A literature review was performed with emphasis on genetics, physiology, and embryology. A PubMed and MEDLINE database literature review from 1930–2017 was performed. We queried for SRY negative 46 XX DSD, complete Y chromosome microdeletion, SRY independent testicular development, and mechanisms of testicular development.
Results: There are two different genotypes with 46, XX testicular DSD that have been observed: SRY-negative and SRY-positive. The SRY region is responsible for expression of the SRY protein that contributes to male phenotype. Translocation of SRY region, duplication of SOX9 locus on chromosome 17 or overexpression of genes involved with testicular development are possible mechanisms. There is a novel gene, NR5A1, recently identified in testicular development independent of SRY and SOX9.
Conclusions: Previously, mechanisms for induction of testicular development in phenotypic males with SRY-negative 46, XX genotypes were unknown. Clinical findings can vary upon presentation to the urologist. There is promising research concentrating on new genes independent of SRY involved with testicular development.



MP4-11. Fig. 1. Suggested patient clinical evaluation and surgical management algorithm for AABP with concurrent urethral stricture disease.

MP4-14

OnabotulinumtoxinA is an effective and well-tolerated treatment for overactive bladder regardless of disease duration or body mass index

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Introduction: This pooled post hoc analysis was undertaken in patients with overactive bladder (OAB) and urinary incontinence (UI) to evaluate the efficacy and safety of onabotulinumtoxinA (onabotA) according to baseline OAB duration and body mass index (BMI).
Methods: OAB patients from 4 placebo-controlled clinical trials who received onabotA 100U were stratified by baseline OAB duration (5

MP4-14. Table 1. Treatment outcomes at week 12 after onabotA treatment

	Baseline OAB duration, y			Baseline BMI, kg/m²			
	<2 (n=279)	2–5 (n=641)	>5 (n=505)	<25 (n=317)	25–<30 (n=454)	30–<40 (n=502)	≥40 (n=153)
UI episodes/day							
Baseline	5.3	5.4	5.6	5.0	5.2	5.7	6.5
Mean change from baseline to week 12	-3.3	-2.9	-3.4	-2.8	-2.8	-3.4	-4.2
Proportion achieving 100% reduction in UI episodes/day at week 12, %	38.7	27.9	27.9	32.5	31.1	29.9	22.9
Proportion achieving ≥50% reduction in UI episodes/day at week 12, %	72.4	62.9	66.9	66.9	65.6	65.1	70.6
KHQ RL domain score							
Baseline	63.8	60.3	57.6	61.4	59.5	58.1	63.8
Change from baseline to week 12	-27.6	-22.0	-21.2	-24.0	-20.6	-21.7	-26.2
Proportion achieving/exceeding MID, %	63.4	57.1	60.6	62.1	54.6	61.2	62.7
KHQ SL domain score							
Baseline	51.6	51.3	54.8	49.9	51.4	53.0	60.0
Change from baseline to week 12	-23.5	-19.8	-21.8	-20.3	-19.1	-22.3	-25.9
Proportion achieving/exceeding MID, %	58.4	56.8	58.8	54.9	54.2	60.0	66.7
Incidence of CIC, %	6.1	4.4	5.0	4.7	5.3	5.4	2.6
Median CIC duration, d	64	74	68	64	68	74	120

[n=505] years) and BMI (2). All patients were inadequately managed with an anticholinergic. Assessments at week 12 following onabotA treatment included mean change in UI episodes/day, proportions of patients with 100% and ≥50% UI reduction, mean changes from baseline in King's Health Questionnaire (KHQ) role (RL) and social limitations (SL) domains, proportions of patients achieving or exceeding the minimally important difference (MID) for KHQ RL and SL, and incidence/duration of clean intermittent catheterization (CIC). Adverse events (AEs) were recorded.

Results: Robust reductions from baseline to week 12 in UI episodes/day were seen with onabotA across all OAB duration and BMI groups (range -2.8 to -4.2) (Table 1). At week 12, 22.9–38.7% of patients across all groups achieved complete continence (100% reduction in UI episodes/day), and most (range 62.9–72.4%) achieved a ≥50% reduction in UI episodes/day. Substantial improvements from baseline to week 12 were seen in KHQ RL and SL in all groups (range: -20.6 to -27.6 and -19.1 to -25.9, respectively) and were approximately 4–5 times the MID (-5 points). The majority of patients across all groups achieved or exceeded the MID for KHQ RL and SL (range 54.6–63.4% and 54.2–66.7%). CIC usage ranged from 2.6–6.1% (median duration, 64–120 days). AE rates were similar across all groups, and urinary tract infection was the most commonly reported AE.

Conclusions: Regardless of prior OAB duration or BMI, a robust treatment response was observed with onabotA, and no clinically meaningful difference was apparent across groups. OnabotA 100U was well-tolerated, with no increased risk of CIC observed across any of the groups.

MP4-15

Retreatment with onabotulinumtoxinA not associated with an increased risk of clean intermittent catheterization in patients with overactive bladder

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Introduction: In patients treated with onabotulinumtoxinA (onabotA) for overactive bladder (OAB), incomplete bladder emptying occasionally results in the need for clean intermittent catheterization (CIC). This post-hoc analysis of pooled placebo-controlled trials in OAB patients with urinary incontinence (UI) was undertaken to evaluate the incidence of CIC after onabotA retreatment.

Methods: OAB patients who were inadequately controlled with an anticholinergic (≥3 urgency UI episodes over a 3-day period and ≥8 micturitions per day) and who received onabotA 100U in any of 4 similarly designed placebo-controlled trials were included in this pooled post-hoc analysis. Patients could be retreated with open-label onabotA as needed/requested if they met predefined criteria, including ≥2 urgency UI episodes and ≤1 urgency UI-free day in a 3-day bladder diary. Also, the interval since their prior onabotA administration had to be ≥12 weeks. CIC usage was evaluated over the 12 weeks following initial treatment and also following retreatment.

Results: Overall CIC rates in the first 12 weeks following the initial treatment were 6.2% (51/825, median duration 85 days) with onabotA. In the 12 weeks after the second treatment, overall CIC rates were 5.5% (26/469) for patients who received onabotA in both treatments 1 and 2 (median duration 37 days); the majority of these patients started de novo CIC after treatment 2 (20/469, 4.3%). Six of the 469 patients (1.3%) who received two onabotA treatments required CIC within 12 weeks after each treatment. For patients who received their first onabotA treatment at treatment 2, the rate of CIC usage was 3.1% (18/582, median duration, 64 days). The mean post-void residual (PVR) volume 12 weeks after treatment 1 was 50.1±65.5 mL with onabotA and 24.3±34.8 mL with placebo. This was consistent 12 weeks after retreatment: 49.8±64.2 mL in patients who received onabotA in both treatments and 50.4±66.4 mL in patients receiving onabotA for the first time.

Conclusions: No increased risk of CIC was observed with onabotA retreatment in this large pooled population of OAB patients. The increase in PVR urine volume 12 weeks after onabotA treatment was minimal and remained consistent following retreatment. A limited number of patients required CIC after both initial onabotA treatment and retreatment.

MP4-16

MRI imaging of human bladder wall using intravesical novel contrast mixture: Applications in painful bladder syndrome/interstitial cystitis (PBS/IC)

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Introduction: There remains an unmet need for an imaging technique that will differentiate ulcerative IC from pelvic floor muscle spasticity in patients with painful bladder syndrome/interstitial cystitis (PBS/IC). MRI is a radiation-free imaging technique that demonstrates excellent contrast of pelvic tissues in 3D-anatomy. In this study, the clinical safety and feasibility of MRI enhanced with intravesical NCM in evaluating patients with PBS/IC was tested.

Methods: After giving informed consent, 6 women (ages 25–78) submitted to 3T MRI before and after intravesical NCM. The 6 women consisted of 2 controls, 2 with non-ulcerative PBS/IC, and 2 with ulcerative PBS/IC. NCM 50 ml was freshly prepared by diluting Gadobutrol (Gadovist, Bayer) 1:250 and Ferumoxytol (Feraheme, AMAG Pharmaceuticals) 1:104 in sterile water for injection (Fig. 1). Single slice of 5 mm thickness was acquired during single breath-hold of 17 seconds for each flip angle to minimize the motion and chemical shift artifacts. Quantitative T1 measurements were made from the differences in signal intensity of 20 pixels representing bladder wall in pre-contrast and post-contrast images.

Results: NCM instillation in subjects did not evoke pain or discomfort. Post-contrast bladder wall T1 relaxation times of ulcerative PBS/IC subjects were reduced from pre-contrast values by 44% compared to 18% for controls and non-ulcerative PBS/IC ($p<0.0001$ using two-way ANOVA followed by Tukey's test) (Fig. 2). NCM enhanced MRI increased the bladder wall CNR in all subjects by 4-fold in post-contrast images (57.84±32.01 vs. 12.34±9.63; $p<0.02$ using paired Student's t test) compared to pre-contrast images acquired with same parameters. Intravesical NCM increased CNR, thereby allowing accurate determination of significant bladder wall thinning from 3.39±0.74 mm to 2.93±0.8 mm ($p<0.05$).

Conclusions: NCM instillation achieves artifact-free differential contrast and spatial resolution of human bladder wall, which is not possible with instillation of injection of single contrast agents. These findings demonstrate the safety and feasibility of NCM enhanced MRI to characterize changes within the bladder wall for phenotyping PBS/IC.

MP4-17

Do different total testosterone cut points for hypogonadism impact male factor infertility parameters?

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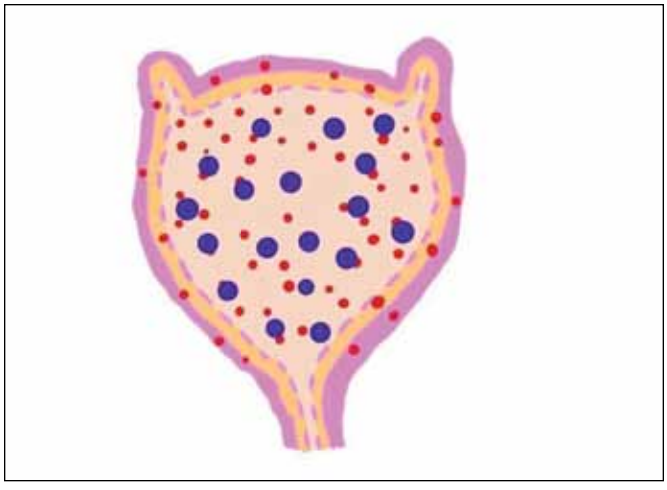
Introduction: Infertility can be a vexing problem for healthcare providers. 8–12% of couples worldwide will experience infertility, with 40–50% of this infertility due to male factors.[1] It is well-understood that hypogonadism has negative impacts on fertility, but establishing which total testosterone (T) level determines hypogonadism has been challenging. Convention has held that lower total T values correlate with worse parameters affecting male factor infertility. A variety of reference values to define hypogonadism are currently being used, including 264 ng/dL, 300 ng/dL, and 400 ng/dL. This study sought to determine if parameters, including sperm concentration, motility, morphology, and testosterone-to-estradiol ratio, varied depending on which reference value was used.

Methods: We performed an IRB-approved retrospective chart review of 115 consecutive males presenting to a community infertility clinic for evaluation of male factor infertility over a 12-month period. Comparative analyses of sperm concentration, motility, morphology, and testosterone-to-estradiol ratios were performed on overlapping populations of 28 males who were hypogonadal according to a cutoff of 264 ng/dL, 36 males according to a cutoff of 300 ng/dL, and 54 males according to a cutoff of 400 ng/dL.

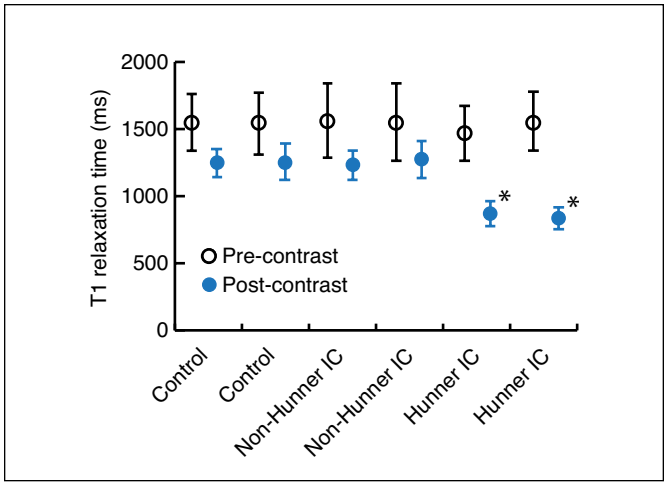
Results: The results of this study demonstrated no significant difference in study parameters (sperm concentration, motility, morphology, and testosterone-to-estradiol ratio) between the different cutoff values for hypogonadism. Furthermore, results showed that there was not a linear relationship between total T and the study parameters associated with male factor infertility.

Conclusions: Results of this study support previous research, which has shown no significant difference in male factor infertility parameters when using different cutoffs for total testosterone to define hypogonadism. This supports the idea that male factor infertility is a multifactorial problem, and that practitioners cannot reliably use hypogonadism (according to any reference level) as a measure of male factor infertility.

Reference:
1. Kumar N, Singh AK. Trends of male factor infertility, an important cause of infertility: A review of literature. *J Hum Reprod Sci* 2015;8:191-6. https://doi.org/10.4103/0974-1208.170370



MP4-16. Fig. 1. NCM is a mixture of 1:250 Gadolinium analog (Gadobutrol) (●) and 1:104 Ferumoxytol (●). The two contrast agents have different sizes and different contrast effects on spin-echo MRI.



MP4-16. Fig. 2. Post-contrast bladder wall T1 values (●) of Hunner type IC subjects were reduced from pre-contrast values (O) by 44% compared with 18% for controls and non-Hunner type IC, *$p<0.0001$.

MP4-18

24-hour urine parameters in nephrolithiasis patients with obstructive sleep apnea

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Introduction: Obstructive sleep apnea (OSA) plays a major role in insulin resistance, hypertension, dyslipidemia, hepatic steatosis, and atherosclerosis. Recent epidemiological evidence indicates an association between OSA and stone formation. This study aimed to evaluate 24-hour urine studies in a cohort of stone formers with OSA diagnosed by polysomnography.

Methods: We queried our institutional database from 2013–2017 and identified 1132 consecutive stone patients with 24-hour urine collections. We excluded patient with hyperparathyroidism, hypercalcemic disorders, renal tubular acidosis, and patients on diet and medications for their stone disease. Descriptive statistics were used to compare 24-hour urine parameters between patients with and without OSA. Logistic regression models were used to assess the association of OSA with different 24-hour urine parameters.

Results: After the exclusion criteria were applied, the cohort included 376 patients. 12% of the cohort had OSA. The mean age was 49 years and mean BMI was 28. Patients with OSA were older approximately 57 years old with a higher BMI of 35. They were significantly more likely to have DM (p<0.001) and HTN (p<0.001). On univariate analysis of 24-hour urine parameters, patients with OSA also had significantly higher urine sodium (p<0.001), lower urine pH (p=0.001), higher urine calcium (p=0.021), higher urine phosphorous (p<-0.001), and higher urine citrate (p=0.021) (Table 1). On multivariable logistic regression, OSA only remained associated with high 24-hour urine phosphorus (OR 2.4; p=0.05) while controlling for age, gender, HTN, DM, and BMI.

Conclusions: OSA is a prevalent condition among stone patients and has a significant impact on different 24-hour urine parameters. If validated in further prospective studies, our findings could help to understand the intricate relationship between metabolic syndrome, insulin resistance, OSA, and stone formation.

MP4-19

Sacral neuromodulation: Determining predictors of success

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Introduction: Refractory overactive bladder (OAB) has detrimental effects on quality of life, and patients often exhaust non-surgical treatment options with minimal improvement in their symptoms. Sacral neuromodulation (InterStim®) is a third-line, FDA-approved therapy for refractory OAB. We evaluated clinical and procedural characteristics of InterStim that predict short-term and long-term efficacy.

Methods: A retrospective chart review was performed on patients who underwent a staged InterStim procedure between January 1, 2007 and January 1, 2018. The clinical and procedural characteristics we evaluated include BMI, comorbidities, age, intraoperative motor responses, and operative time. Endpoints included placement of implantable pulse generator (completed Stage 2 InterStim procedure), InterStim lead revision, as well as patient-reported clinical responses at various timepoints. Using SAS 9.4 descriptive statistics, including mean and standard deviation for continuous variables and the frequency and percentage for categorical variables, were reported respectively. The Mann-Whitney U-test was used to compare mean differences and the Chi-square test was used to compare the percentage differences between two groups.

Results: We performed a retrospective analysis of 142 female subjects with a mean age of 62.9 years (SD ± 14.2). Mean operative time for stage 1 was 73.6 minutes (SD ± 20.7), and 75% had prior pelvic surgery. The mean BMI was 31 (SD ± 7.62). A total of 91.4% of patients had a successful Stage 1 InterStim trial and went onto Stage 2 InterStim, and 82% of these patients reported success at their first postoperative appointment. Furthermore, 75% reported continued success at their 3–6-month followup. Yet, 24% required InterStim lead revision for either lack of efficacy, pain, and/or infection. Intraoperative motor responses were analyzed and patients were divided into either group 1 (anal bellows and great toe dorsiflexion in either 1, 2, or 3 electrodes) or group 2 (anal bellows and great toe dorsiflexion in all 4 electrodes). There was no statistically significant difference between these 2 groups in the rates of patients that went onto complete Stage 2 InterStim, self-reported success, or required lead revision.

Conclusions: Sacral neuromodulation is well-established treatment for refractory OAB; however, there is limited literature on what characteristics predict patient success or failure with this therapy. The total number of electrode responses during intraoperative testing did not impact either short- or long-term success.

MP4-18. Table 1. A univariate analysis: values of 24-hour urine parameters in stone patients with and without OSA

	OSA (n=45)	No OSA (n=331)	p
pH	5.75	6.03	p=0.001
Sodium	224	161	p<0.001
Calcium	279	208	p=0.021
Phosphorous	1.2	0.8	p<0.001
Citrate	803	594	p=0.021

MP4-20

Nocturic void reduction and quality of life improvement with AV002, an emulsified microdose desmopressin nasal spray

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Associated Medical Professionals[1]; Advanced Urology Centers of NY[2]

Introduction: Nocturia is a highly prevalent, under-recognized condition associated with disrupted sleep, reduced productivity, and negative impacts on overall health and health-related quality of life. 88% of nocturia is caused by nocturnal polyuria (NP), the overproduction of urine by the kidneys at night. AV002 is an emulsified microdose desmopressin nasal spray approved for the treatment of nocturia due to NP. The efficacy of AV002 on achieving a reduction of ≥1 nocturic voids (NOVs) and safety were assessed in 2 Phase 3 randomized, double-blind pivotal studies. Patients' quality of life was assessed in one study.

Methods: Male and female patients ≥50 years old with NP at screening and a history of ≥2 NOVs per night for ≥6 months (n=1045) were randomized to AV002 1.66 mcg, AV002 0.83 mcg, or placebo and treated for 12 weeks. Patients completed 3 consecutive day voiding diaries weekly during screening and at weeks 1, 2, 3, 4, 6, 8, 10, 12, and 14 post-randomization. The proportion of patients achieving a reduction of ≥1 NOV was measured. Patients' level of concern about nocturia, tiredness, and drowsiness were reported via the Impact of Night Time Urination (INTU) health-related quality of life instrument. Safety evaluations included adverse events (AEs) and incidence of hyponatremia.

Results: The proportions of patients achieving a reduction of ≥1 NOV vs. baseline were 70%, 69% and 56% in the AV002 1.66 mcg, AV002 0.83 mcg, and placebo arms, respectively (p<0.05 for both AV002 doses vs. placebo). AV002 patients were 2.5–2.9 times more likely to report not at all concerned, tired, or drowsy due to nocturia compared to baseline. Incidence and severity of AEs in AV002-treated groups were similar to placebo. Incidence of severe hyponatremia (serum sodium ≤125 mEq/L) was low across all treatments: 1.5%, 0%, and 0.3% of AV002 1.66 mcg, AV002 0.83 mcg, and placebo patients, respectively.

Conclusions: ~70% of patients treated with AV002 achieved an average reduction of at least 1 nocturic void per night, and over half of the AV002 patients were no longer concerned about having to get up at night to urinate. No patients treated with 0.83 mcg (recommended starting dose for patients ≥65 years) had severe hyponatremia. These results confirm the efficacy and safety of AV002 and demonstrate improved quality of life measures in patients with nocturia secondary to nocturnal polyuria.

Moderated Poster Session 5: Education, Laparoscopy, Robotics, and Surgical Innovation

Moderators: Jason Y. Lee, MD; Peter Wang, MD, University of Western Ontario

MP5-01

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

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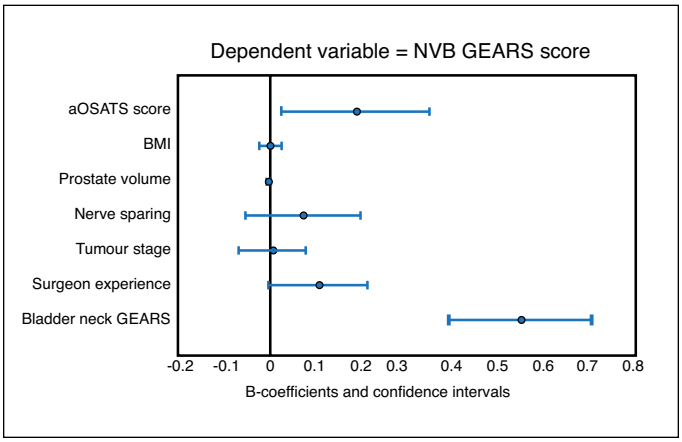
Introduction: Recent evidence suggests that the technical performance of the surgeon contributes to the variability in patient outcomes following robotic-assisted radical prostatectomy (RARP). However, our understanding of the bedside assistant's role remains limited. The objective of this study was to quantify and test the impact of assistant skill on surgical performance during a step of RARP.

Methods: Prospective, intraoperative video from consecutive RARP cases at three cancer-referral centers was collected. The neurovascular bundle step (NVB) was chosen for analysis. Expert surgical analysts scored the performance of the primary surgeon using the Global Evaluative Assessment of Robotic Skills (GEARS). Assistant performance was rated using a modification of the Objective Structured Assessment of Technical Skills (aOSATS), comprised of 4 of the 7 OSATS domains. Spearmans Rho correlations were used to test the relationship between assistant and surgeon technical performance, stratified by previous surgeon case experience, and linear regression was used to control for surgeon and patient-level effects.

Results: A total of 91 RARP cases had complete surgeon and assistant assessment data for analysis. 15 experienced faculty (>50 cases) and 22 trainee bedside assistants were included in the study. Trainee experience ranged from 0 cases as bedside assist to more than 30. Interrater reliability of the aOSATS was acceptable (0.71). aOSATS score was significantly associated with level of training (p=0.02). aOSATS score showed significant positive correlation with GEARS score, but only in surgeons with 100–249 case experience (Spearman's Rho = 0.56; p=0.01), and greater than 250 cases completed (Spearman's Rho = 0.32; p=0.03). On linear regression, aOSATS remained a significant predictor of surgeon GEARS score, controlling for patient- and surgeon-level factors, including the GEARS score of the bladder neck step.



MP5-01. Fig. 1. Multivariable linear regression.

Conclusions: This is the first study to investigate the impact of assistant technical skill on surgeon performance in RARP. Our prospective, multisurgeon approach adds robust validity evidence for a modified rating tool to quantify bedside assistant performance. Our hypothesis-generating data suggest that assistant skill has important implications on surgeons who have moved beyond the early RARP learning curve, and these findings should inform how best to integrate trainee surgeons into the robotic operating room.

MP5-02

Clinical trial failures in urology: Causes and predictors of early failure

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Introduction: Clinical trials serve as a critical source of information to guide evidence-based practices in urology. Conversely, trials that are prematurely abandoned consume resources and results are underreported in

MP5-02 Table 1. Multivariable Cox proportional hazard ratios for early trial failure

Parameter	Hazard ratio	95% hazard ratio confidence limits		p
Phase (the reference level is Early)				0.9655
Late	1.024	0.810	1.294	0.8408
Not provided	1.002	0.743	1.351	0.9913
Subspecialty (the reference level is Oncology)				<0.0001
Endo	1.643	1.021	2.643	0.0407
Female	1.597	1.194	2.135	0.0016
General	1.633	1.291	2.066	<0.0001
Infertility/Andrology	1.201	0.626	2.303	0.582
AUA Section (the reference level is Multi-Sectional)				0.0463
NE	0.736	0.537	1.008	0.0557
New England/New York	0.707	0.446	1.121	0.1404
North Central	0.593	0.421	0.836	0.0029
South Central	0.852	0.595	1.222	0.3839
SE	0.541	0.345	0.848	0.0074
Western	0.928	0.659	1.306	0.6686
International	0.805	0.6	1.082	0.1506
Mid-Atlantic	0.855	0.547	1.337	0.4912
Intervention type (the reference level is Other)				0.0820
Behavioral	1.374	0.634	2.977	0.421
Device	1.399	0.986	1.983	0.0599
Drug	0.95	0.761	1.187	0.6529
Genetic	0.714	0.43	1.185	0.1928

the literature. We sought to investigate causes of trial failures in urology and establish predictors of early failure.
Methods: We queried *ClinicalTrials.gov for* withdrawn or terminated urologic trials from 2006–2016, adapting a previously published natural language algorithm designed to capture clinical trials in urology. After removing duplicates, 1674 trials met screening criteria. Trials were screened by two investigators for applicability to urology and disputes were resolved by a third independent reviewer, with 616 trials meeting final inclusion criteria. Data extracted included: phase of trial, reason for failure, subspecialty, AUA sectional location, and intervention type. Univariable and multivariable Cox proportional hazards regression, Kaplan-Meier, and log rank tests were used to find factors associated with early trial failure, defined as termination before 25 months.
Results: The most frequent cause of trial failure was poor accrual (41.4%), followed by other (24.8%), inadequate budget (8.6%), and sponsor cancellation (7.6%). Trial phase and type of intervention were not predictive of early failure, whereas subspecialty and AUA section were ($p<0.05$). On multivariable analysis, endourology, female, and general urology trials failed at a higher rate than oncology. Among AUA sections, multisectional (i.e., trials spanning multiple sections) and the Western section had the highest rates of early failure, whereas North-central and Southeastern demonstrated the lowest rates.
Conclusions: Poor accrual accounts for the largest category of trial failures in urology. Oncology has the lowest rates of early trial failure across subspecialties and there were variable rates by AUA section.

MP5-03
Alvaro Morales: 40 years of Bacillus Calmette-Guérin, bladder cancer, and beyond
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Introduction: More than 40 years since Alvaro Morales published data showing efficacy of BCG in non-muscle-invasive bladder cancer, BCG remains the most studied, most effective, and longest continually used immunotherapy for any cancer. Although much is known about the drug, we explore the scientist behind its discovery.
Methods: We reviewed interviews, commentaries, and papers referencing Morales from 1976 to the present. Multiple interviews with Morales were conducted, as well as that of his contemporaries and researchers influenced by his publications.
Results: Morales was born and raised in the country of Columbia, and came to North America for surgical and urological training. Morales was a young academic faculty member at Queen's University in Kingston, Canada when he came across Zbar and Rapp's work at the National Cancer Institute regarding BCG, and was inspired to pursue a research study revolving around bladder cancer. However, Morales's first grant to the NCI was rejected and labeled by one reviewer as "a throwback from the stone age of tumor immunology." A second application, to the Cancer Research Institute of New York, was successful. At Queen's, Morales, along with Eidinger and Bruce, published data showing a decrease in recurrence rate of NMIBT in 1976. A 1978 grant from the NCI followed, which led to 2 seminal randomized control trials performed by Southwest Oncology Group and Memorial Sloan Kettering Cancer Center looking at the role of intravesical BCG in the treatment of carcinoma in situ. Morales also delved deeply into andrology and sexual medicine, and with his research team, developed one of the first centrally acting erectogenic oral drugs.
Conclusions: With his seminal publication in 1976 noting that weekly intravesical BCG administration decreased bladder cancer recurrence, Dr. Morales paved the way for the Food and Drug Administration approval of BCG for CIS treatment in 1990. Dr. Morales changed the course of urology with his bold ideas, passion for innovation, numerous publications, and time spent on committees and editorial boards. He is a living legend.

MP5-04
A qualitative assessment of urologic call coverage at a multi-hospital academic residency training program
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Introduction: At our institution, junior residents (PGY-2 and -3) cover inpatients and consultations for 5 hospitals from 6:30 pm to 5:30 am every 5–7 nights from home. Residents then complete a regular work period the following day, per the current Accreditation Council for Graduate Medical Educations (ACGME) policy for home call. Due to concerns about patient safety and physician fatigue, our institution is planning a transition to a "night float" system, where a dedicated resident provides night coverage for one month at a time and is off duty during the day. In the context of this planned transition, we aim to evaluate the current home call system to help guide future quality improvement programs.
Methods: A survey was administered to junior residents, senior residents (PGY-4+), and faculty to evaluate the current home call system based on 4 domains using a 5-point Likert scale (1-very poor to 5-very good): patient care, communication, quality of life, and resident education. The survey also assessed preferred system for night coverage. Finally, junior residents were queried on duty-hour compliance based on current ACGME policy for weekly and daily work hours.
Results: Our response rates were 73% (8/11), 70% (7/10), and 60% (12/20) for junior residents, senior residents, and faculty, respectively. Residents (94%, all levels) preferred transition to a new call system, compared to 45% of faculty (Table 1). Higher level of training was associated with increased positivity of ratings across all domains. 63% (5/8) and 88% (7/8) of junior residents reported at least one violation of the 80-hour work week rule and the 8-hour shift rule in the past month.
Conclusions: This study highlights key areas for quality improvement in providing night coverage for this 5-hospital system affiliative. Ongoing work will assess these domains after transitioning to the night float system.

MP5-05
Patient-specific 3D imaging and 3D printed models enhance preoperative planning for percutaneous nephrolithomy
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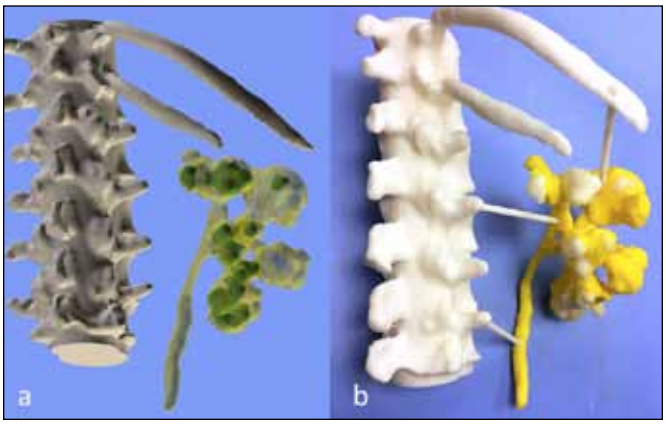
University of Rochester
Introduction: When planning for percutaneous nephrolithotomy (PCNL), surgeons face an amalgam of complex anatomy, varied treatment options, and poor radiological representation while relying only on 2D imaging. While expert surgeons can reliably co-register patient's imaging to their anatomy mentally, this task is challenging and subject to error for novices. This process may be enhanced by use of patient-specific 3D representations. We aim to compare two patient-specific 3D modalities, a virtual model (VM) and tactile 3D printed models (PM), as adjuncts to the gold standard non-contrast CT scan (NCCT) for PCNL conceptualization in novices.
Methods: VMs of 4 patients that underwent PCNL for treatment of complex renal stones were created by converting DICOM images into stereolithography files (Fig. 1A). The VMs were specific to each patient and included the pelvicalyceal system (PCS), calculi, spine, and last 2 ribs. VMs can be manipulated in all dimensions and the PCS made transparent. VMs were 3D-printed into tactile 3D PMs (Fig.1B). A total of 8 urology residents (PGY1-6) completed a questionnaire assessing anatomical and procedural knowledge for each PCNL case, first after viewing standard NCCT and then again after viewing one of the two model types. Resident responses for each modality were compared with expert NCCT answers to assess accuracy. A cumulative probability score was used to compare mean correlation scores across model types using Chi-square resident impressions of models were gathered via a 5-point Likert style survey.
Results: VMs were used 17 times and the PMs 15 times after NCCT to assess 4 different patients. Accuracy for assessing stone burden and location was highest for PMs (0.87 vs. 0.82; $p=0.18$). VMs had higher score for anatomical relationships than PM or NCCT (0.59 vs. 0.36 vs. 0.31), but 5/7 residents ranked the VM as the more useful adjunct to NCCT.

MP5-04. Table 1. Survey responses by level of training

Domain	Sub-domain	PGY 1–3	PGY 4–6	Faculty
Preference (%)	Home call	13%	0%	30%
	Night float	87%	100%	45%
	No preference	0%	0%	25%
Patient care (mean on 5-point scale)	Continuity of care	2.0	2.4	3.7
	Compassion of care	1.7	2.0	3.6
	Patient safety	2.3	2.0	3.7
	Impact on patient outcomes	2.1	2.4	3.9
	Impact on day team efficiency	1.6	2.0	3.4
Communication (mean on 5-point scale)	With nursing	2.4	3.4	3.9
	With other services	2.4	3.0	3.7
	With day team	3.0	3.4	4.0
	Existence of clear hand-off procedure	3.3	3.7	4.3
Quality of Life (mean on 5-point scale)	Time for loved ones	1.4	1.7	2.8
	Time for hobbies	1.3	2.0	2.8
	Overall quality of life	1.6	2.0	2.9
	Adequately rested following call shift	1.7	1.7	2.7
Education (mean on 5-point scale)	Support	2.7	3.0	3.6
	Autonomy	3.1	3.0	2.6
	Accountability	3.1	3.4	4.0
	Time to read	1.1	1.1	3.4
	Surgical case volume	2.7	3.4	3.7
	Time for research	1.4	1.1	2.8
Duty hour compliance (% with ≥1 violations in 1 month)	80-hour work week	63%	N/A	N/A
	8-hour shift	88%	N/A	N/A

Conclusions: Patient-specific 3D-printed and virtual models are complementary technologies that hold promise as adjuncts to NCCT in PCNL planning. These learning tools may expedite the learning curve for PCNL, helping trainees transition better from 2D imaging into the 3D space of the operating room.



MP5-05. Fig. 1. (a) Virtual 3D Model (VM); and ***(b)*** 3D printed model (PM) from the same patient.

MP5-06

Trainee's experience with three different percutaneous nephrolithotomy (PCNL) access simulations: A comparative analysis.

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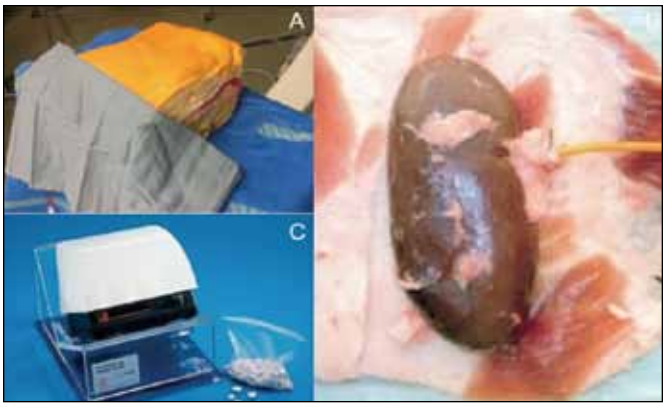
University of Rochester

Introduction: Surgical simulation is a promising method to expedite the learning curve in PCNL, however, the ideal modality has not been established, especially from the trainee's perspective. We previously created a multilayered hydrogel model for PCNL using 3D printing technology, which can be reproduced and modified for different skill levels. We aimed to compare the performance of our hydrogel simulator to both a porcine animal model with well-established high tissue fidelity and a commercially available silicone bench-top simulator.

Methods: Models based on anatomy of 4 patients were 3D printed after converting DICOM images into stereolithography files. Multilayered hydrogel models were constructed using our previously described technique (Fig. 1A). Porcine models incorporating fresh specimens were obtained from Cook Medical (Fig. 1B). Both models included the pelvicalyceal system, spine, and ribs and required fluoroscopic guidance. The PCNL trainer is a benchtop, translucent nephrolithotomy slab and lightbox that simulates the x-ray imaging (Limbs & Things, Bristol, U.K.) (Fig. 1C). 10 urology residents (PGY1–6) participated in simulations using each model type to gain percutaneous access and dilate, after which a 5-point Likert style questionnaire was used to assess impressions of each model. Responses for were compared using t-tests.

Results: Responses to 10 Likert-style questions were obtained from each resident for each model, except for 1 resident for the benchtop model. Both hydrogel and porcine models significantly outperformed the silicone model, with mean scores of 4.2 and 4.0, respectively, vs. 2.2 (all p values <0.0001). Trends favored hydrogel models for simulation activities (4.7 vs.



MP5-06. Fig. 1. (A) Patient-specific multilayered hydrogel model using 3D printed components; ***(B)*** porcine model (Cook Medical); and ***(C)*** bottom-lit silicone bench-top percutaneous nephrolithotomy trainer (Limbs & Things, Bristol, U.K.

4.2; p=0.85) and tissue quality (4.1 vs. 3.6; p=0.99) for porcine models. There were no statistically significant differences in impressions of the two models; however, residents reported better anatomical accuracy in the hydrogel model and tissue quality in the porcine model. 7/10 residents felt the hydrogel model was most beneficial to learn PCNL access.
Conclusions: Our current hydrogel PCNL simulation is comparable to porcine models in terms of anatomical accuracy, procedural fidelity, and tissue fidelity, but holds distinct advantages in terms of reproducibility, modifiability, and practicality.

MP5-07

Smart imaging: An innovative strategy utilizing molecular chemical imaging to differentiate anatomical structures in genitourinary surgery

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Introduction: Visualization of critical structures, such as ureter, blood vessels, and lymph nodes during surgery can be challenging due to anatomical variations, prior treatments, and surgical complexity. Likewise, identification of prostatic neurovascular bundles (NVBs) can be difficult in nerve-sparing procedures such as radical prostatectomy (RP). Misidentification of structures can lead to iatrogenic injuries or impaired postoperative function. To augment a surgeon's ability to discriminate different structures, a contrast-free intraoperative device capable of detecting different anatomical structures in real-time is an unmet clinical need. We have developed a Molecular Chemical Imaging endoscope (MCI-E), which combines molecular spectroscopy and digital imaging into a non-contact sensing strategy that provides "*smart imaging.*" Smart imaging exploits machine learning and computer vision approach to provide improved situational awareness – the awareness of things.
Methods: MCI-E uses liquid crystal tunable filters capable of collecting hyperspectral images and videos in the visible and near-infrared spectrum. For in vivo studies, MCI-E employs a rigid endoscope on a porcine surgical model. For *ex vivo* studies, MCI employs a macro lens to evaluate human prostate removed after RP. To evaluate the performance of MCI-E, tissue detection score images and videos exhibiting contrast between target and surrounding tissues were quantified with the signal-to-noise ratio (SNR), area under the ROC curve (AUC), sensitivity (Sn) and specificity (Sp).
Results: Analysis of 21 prostates imaged ex vivo demonstrated that MCI could distinguish prostate capsule from surrounding tissue with 94% Sn, 87% Sp, and 0.93 AUC. Vas deferens were differentiated with 94% Sn and 92% Sp, and 0.95 AUC. In vivo testing results showed NVBs could be visualized with a contrast SNR of 3.1 and AUC of 0.98. Pelvic vasculature of different sizes could be distinguished, with representative contrast measuring 4.6 SNR and 1.00 AUC. Lymph nodes showed contrast with SNR of 5.6 and AUC of 0.98. Real-time, high-contrast MCI-E video output demonstrated the potential of this new imaging modality to augment a surgeon's ability to discriminate structures in challenging anatomical situations.
Conclusions: Initial in vivo MCI-E experiments indicate that this strategy can supplement a surgeon's conventional view of a surgical procedure, enabling enhanced visualization of critical structures in real-time without contrast agents.

MP5-08

Patient and procedure-specific factors on robotic-assisted perioperative times: A target for quality improvement

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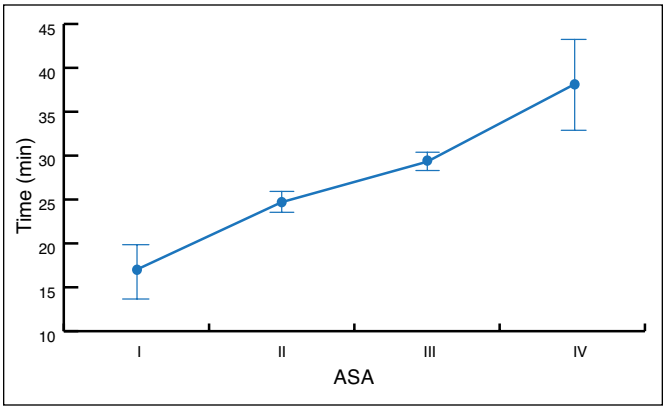
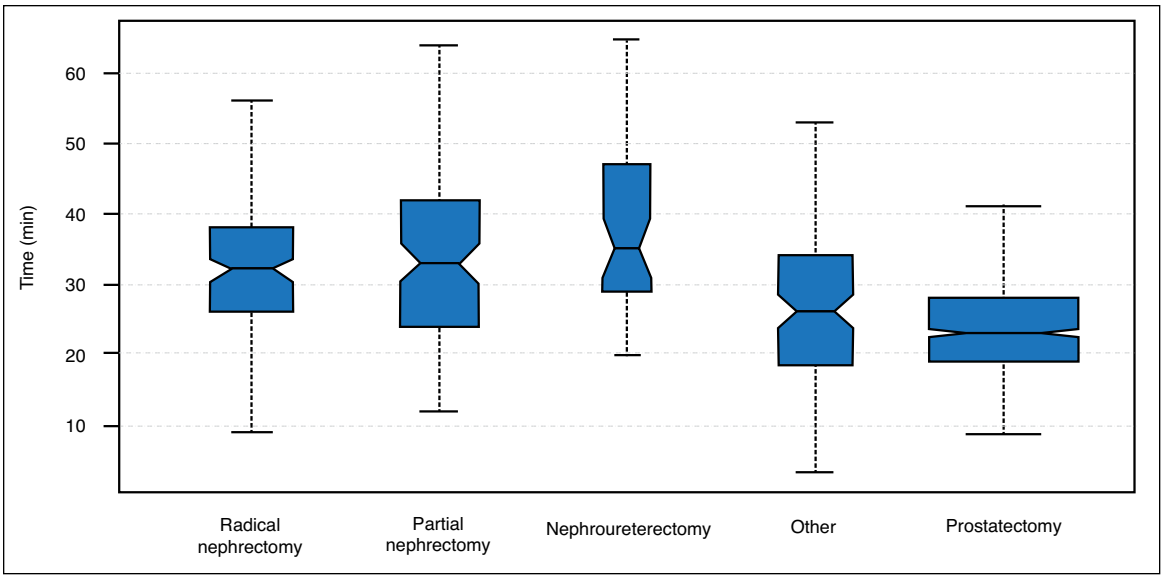
Introduction: Robotic-assisted techniques are widespread in urology. However, preparation time for robotic cases can hinder OR efficiency. Quality improvement (QI) studies in robotic-assisted surgery have focused on cost reduction, outcome improvement, and reducing operative times. Perioperative times are another opportunity for QI. Our objective was to characterize non-operative OR times in robotic urology cases and to determine the effect of patient- and procedure-specific characteristics.
Methods: Patients undergoing robotic-assisted urology procedures at our institution had routine perioperative collection of demographic data and OR time stamps. Following IRB approval, we retrospectively reviewed preoperative times (including robot setup time) and postoperative times from our OR database. Multivariable analysis was used to assess the influence of independent categorical variables — sex, smoking history, American Society of Anesthesiologists (ASA) physical status classification — and continuous variables — age, BMI, Charlson Comorbidity Index (CCI) — on perioperative times.
Results: A total of 808 patients undergoing 816 robotic-assisted procedures over a 5-year period (2013–2018) met inclusion criteria. Increasing ASA and CCI, and a positive smoking history were significantly associated with an increase in perioperative times, in particular robot setup times. Additionally, robot setup times varied greatly based on procedure type.
Conclusions: Our data demonstrate that greater patient complexity prolongs preoperative times in robotic cases. There is also tremendous variability of robot setup times based on procedure-specific characteristics. These data suggest that reducing non-operative OR times in complex patients is a good target for QI.



MP5-08. Fig. 1. Robot setup time across ASA classification.



MP5-08. Fig. 2. Robot setup time across procedure.

MP5-09
Gender disparities in financial relationships between industry and academic urologists

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Introduction: Even as the number of female urologists in the United States has been growing, gender inequalities persist in the medical profession. We conducted this study to examine if there are gender disparities in the relationships between pharmaceutical companies and academic urologists.

Methods: We constructed a comprehensive database of all current, full-time urology faculty from the online websites of the US urology academic residency programs. We collected information on gender, academic rank, and fellowship training. Industry contributions received in 2016 were collected through the CMS Open Payment database. We used Wilcoxon rank sum test to compare the industry payments by academic rank or fellowship type for each gender.

Results: Of the 1657 academic urologists, 1433 (86%) were men and 224 (14%) were women. In 2016, industry provided a total of $16 232 187 in payments to academic urologists. $15 893 543 (97.9%) of funds went to male academic urologists. Male urologists received greater industry contributions compared to female urologists (median, $222 vs. $129; p<0.001). Contributions were significantly greater for men vs. women at assistant professor and professor academic ranks (median, $192 vs. $98; p=0.049, and $258 vs. $148; p=0.04, respectively), but not for associate professors (median, $235 vs. $224; p=0.23) Non-fellowship-trained male urologists received greater contributions compared to non-fellowship-trained female urologists (median, $340 vs. $202; p=0.02). All fellowship-trained urologists had similar industry contributions, except those trained in endourology/minimally invasive/robotic urology, where male urologists received more than female urologists (median, $414 vs. $63; p=0.03). All fellowship types did not have statistically differences in industry payments by gender, except for endo fellowships, which a greater contribution of industry payments to males compared to females (median, $414 vs. $63; p=0.03) (Table).

MP5-09. Table 1. Characteristics of industry payments by fellowship traininng of academic urologists

	Men		Women		
Fellowship type	**n (%)**	**Median $ (IQR)**	**n (%)**	**Median $ (IQR)**	**p**
Fellowship-trained					
Andro	68 (73)	385 (0–3233)	4 (50)	74 (0–354)	0.061
Dyn	12 (83)	743 (149–9474)	39 (85)	525 (20–2357)	0.275
Endo	158 (88)	414 (71–3393)	13 (87)	63 (3–454)	**0.03**
Neuro	10 (77)	7907 (47–199 989)	1 (100)	194 (194–194)	0.394
Onc	250 (78)	275 (13–2664)	11 (69)	265 (0–1399)	0.206
Ped	104 (53)	4 (0–196)	26 (49)	0 (0–145)	0.335
Recon	58 (88)	531 (158–2657)	16 (89)	560 (173–1043)	0.577
Research	11 (64)	573 (0–9749)	0 (0)	0 (0–0)	0.132
Transplant	9 (64)	89 (0–182)	0 (0)	—	—
No fellowship	340 (77)	202 (14–880)	44 (68)	82 (0–419)	**0.02**

n represents the number of academic faculty who received industry payments. Fellowship training was organized into the following major urologic subspecialties: Andro (andrology/male infertility), Dyn (urodynamics/female urology), Endo (endourology/minimally invasive/robotic urology), Neurourology, Onc (urologic oncology), Ped (pediatrics), Recon (trauma and reconstructive urology), Research, Transplant. P values were determined by the Wilcoxon rank sum test for continuous variables. Significance was set at p<0.05.

Conclusions: Industry payments disproportionately are given to men compared to women in academic urology. These differences persist for females who are assistant professors and professors in urology. These gender disparities in industry payments do not exist between fellowship-trained urologists, except for those trained in endourology/minimally invasive/robotic urology.

MP5-10

Resident exposure to open vs. robotic cystectomy at academic medical centers in the era of robotic surgery

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Introduction: As evidenced by well-established trends in radical prostatectomy, urologic surgery is shifting toward less invasive, robotic-assisted surgery. As a result, robotic training has become an increasingly important feature of urology residency. This raises the question of whether proficiency in robotic surgery is being achieved at the expense of training in open surgery. The objective of this study to determine trends in surgical approach, robotic vs. open, toward radical cystectomy at academic medical centers to characterize the resident experience.

Methods: Data from the National Cancer Database was obtained for all patients who underwent cystectomy at academic or research programs as part of treatment for bladder cancer between 2010 and 2015. For each year, patients were grouped by surgical approach: open, laparoscopic, or robotic. Patient demographics and disease states were compared between years. The absolute number of cystectomies performed using each surgical approach and the percentage of total cystectomies performed using each surgical approach was observed over time. National and regional trends were assessed.

Results: A total of 16 630 patients underwent cystectomy at an academic or research program as part of treatment for bladder cancer between 2010 and 2015. In 2010, of 2640 cystectomies performed, 1967 (74%) were performed open, 175 (7%) were performed laparoscopically, and 498 (19%) were performed robotically. In 2015, of 2762 cystectomies performed, 1754 (64%) were performed open, 224 (8%) were performed laparoscopically, and 784 (28%) were performed robotically. Nationally, between 2010 and 2015, an increasing trend was observed in robotic cystectomies and a decreasing trend was observed in open cystectomies. The percentage of robotic cystectomies increased by 9%, while the percentage of open cystectomies decreased by 10%. The absolute number of robotic cystectomies increased by 57% while the absolute number open cystectomies decreased by 12%. This trend was observed in all geographic regions, except in the Mountain region, where no change was observed in robotic cystectomies and the percentage open cystectomies increased by 3%. The decreasing trend in open cystectomies was most pronounced in the West South Central region, where the percentage of open cystectomies decreased by 24%. In all other regions, the percentage of open cystectomies decreased by 4–20%.

Conclusions: The number of open cystectomies performed at academic medical centers has decreased nationally between 2010 and 2015. Used as a surrogate for the urology resident experience, this data suggests that training in open surgery is decreasing rapidly.

MP5-11

Trajectory of surgeons' eye movement during robot-assisted surgery: Feasibility analysis

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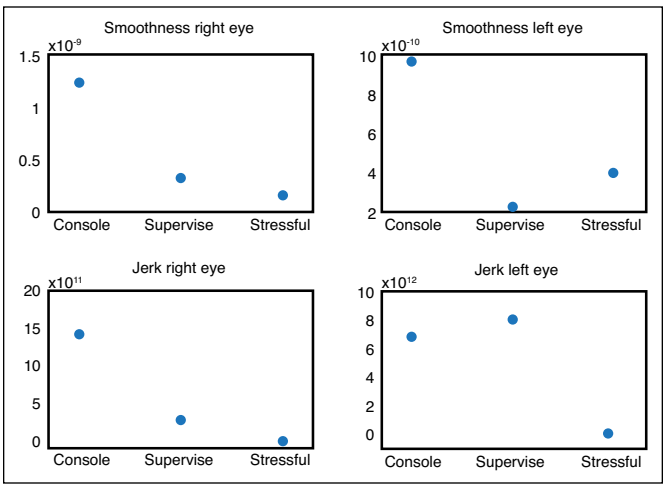
Introduction: Body movements are controlled by the central nervous system (CNS) and can be defined using trajectories and biological laws, previously used for rehabilitation areas. Whether such methods can be applied in surgery to differentiate technical performance is yet to be defined.

Methods: Eye movement (TobiiPro2, frequency 50 Hz) of an expert surgeon (>3000 robot-assisted surgeries [RAS]) while performing and supervising 8 lymph node dissections (LNDs) was evaluated based on IRB approved protocol. Power spectral analysis was used to extract eye gaze trajectory smoothness level and jerk score, which were compared across LNDs, performed and supervised, using analysis of variance (ANOVA) test.

Results: Right eye trajectory jerk level was significantly different between performing and supervising pLNDs (p=0.0001). Among performed LNDs, there was a difference between LNDs without intraoperative complications and one procedure with intraoperative bleeding (p=0.0001). The expert surgeon's right eye movements were more jerky during performance compared to supervision and also while performing stressful procedures (bleeding). While expert surgeon reacts quickly, it seems he has enough experience to manage the complication with low demand for cognitive resources.

Conclusions: We report, to our knowledge, the first study that evaluates real-time dynamic measurements of console surgeon's eye movement trajectory in the operating room. These features may provide a deeper understanding about the psychological and cognitive status of the surgeons, and help separate levels of expertise.



MP5-11. Fig. 1.

MP5-11. Table 1. Smoothness and jerk level for trajectories extracted from expert surgeon's right and left eyes while performing pLND operation on console

Function	Recording	Smoothness right	Smoothness left	Jerk right	Jerk left
Console	1	9.27×10^{-10}	9.48×10^{-10}	4.04×10^{11}	7.12×10^{11}
Console	2	3.84×10^{-11}	4.45×10^{-11}	2.48×10^{12}	6.11×10^{12}
Console	3	3.6×10^{-10}	4.8×10^{-10}	2.05×10^{12}	1.75×10^{13}
Console	4	7.49×10^{-10}	6.82×10^{-10}	8.15×10^{11}	4.03×10^{12}
Console	5	3.8×10^{-9}	2.9×10^{-9}	8.8×10^{10}	4.1×10^{11}
Console	6	1.6×10^{-9}	8.013×10^{-10}	2.8×10^{12}	1.2×10^{13}
Average		**1.3×10^{-9}**	**9.8×10^{-10}**	**1.4×10^{12}**	**6.8×10^{12}**

MP5-11. Table 2. Smoothness and jerk level for trajectories extracted from expert surgeon's right and left eyes while supervising pLND

Function	Recording	Smoothness right	Smoothness left	Jerk right	Jerk left
Supervision	1	$5.3x10^{-10}$	$3.03x10^{-10}$	$1.4x10^{11}$	$3.9x10^{12}$
Supervision	2	$1.39x10^{-10}$	$1.33x10^{-10}$	$4.54x10^{11}$	$1.23x10^{13}$
Average		**$3.34x10^{-10}$**	**$2.18x10^{-10}$**	**$2.97x10^{11}$**	**$8.1\ x10^{12}$**

MP5-11. Table 3. Smoothness and jerk level for trajectories extracted from expert surgeon's right and left eyes while performing stressful pLND operation on console

Function	Recording	Smoothness right	Smoothness left	Jerk right	Jerk left
Intra-operative complication	1	$1.68x10^{-10}$	$4.05x10^{-10}$	$9.7x10^{9}$	$1.3x10^{10}$

MP5-12

A urinary diversion technique using retubularized bowel harvested from prior augmentation cystoplasty

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Introduction: We describe a technique to produce a urinary conduit by harvesting and retubularizing a bowel segment previously used to perform augmentation cystoplasty.

Methods: This procedure has been performed in two patients. Surgical time, estimated blood loss, hospital stay, return of bowel function, and postoperative complications are reported as short-term results. Change in renal function and radiographic findings are reported as intermediate-term outcomes.

Results: One patient had a prior sigmoid colon augmentation cystoplasty and one patient had a ileal augmentation cystoplasty. The operative times were 360 minutes and 390 minutes, respectively. Both patients underwent supratrigonal cystectomy. Estimated blood loss was 350 cc in the first case and 300 cc in the second. The first patient had a return of bowel function in 2 days and a total hospital stay of 2 days. The second patient had return of bowel function in 2 days and a hospital stay of 3 days. There were no postoperative complications in the first patient, while the second patient had a persistent fluid collection requiring parenteral antibiotics, percutaneous drainage and readmission. The first patient has a stable eGFR (>90) at 18 months and had no hydronephrosis, and bilateral reflux on loopogram at 12 months followup. The second patient had no hydronephrosis on CT imaging and stable eGFR (>90) at 12 months followup.

Conclusions: In this initial experience, a segment of bowel harvested from an augmentation cystoplasty was retubularized to create a urinary conduit. This technique allowed keeping GI system in continuity, thus avoiding inherent associated with additional bowel harvest and re-anastomosis. A larger series and longer followup will determine the reliability of this technique.

MP5-13

International, multi-institutional experience with transurethral ventral buccal mucosa graft (BMG) inlay for treatment of distal urethral strictures

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Introduction: We aimed to present an international, multi-institutional study of a patient cohort with distal urethral strictures treated with a previously described transurethral buccal mucosa graft inlay urethroplasty technique.

Methods: A retrospective, multi-institutional study of consecutive patients with fossa navicularis strictures treated with a transurethral ventral BMG inlay urethroplasty technique was conducted. Patients who underwent concurrent urethroplasty of other urethral segments were excluded. Patient demographics, stricture characteristics, perioperative (surgical time, EBL, hospital stay), and postoperative clinical and patient-reported outcomes were analyzed. The primary postoperative outcomes were stricture recurrence and complications. Secondary outcomes were change in maximum urinary flow rate (Qmax), PVR, IPSS, SHIM, and global response assessment (GRA) questionnaire responses.

Results: 58 men underwent the described repair at 10 institutions between 3/2014 and 3/2018; 53 met the inclusion criteria (Table 1). Mean operative time and EBL were 90 min (25–160) and 30 ml (5–110), respectively. 43 men completed ≥12 months followup. At a mean followup of 18 months (12–50), 40 patients (92.5%) remained stricture-free. Mean Qmax improved from 6 to 20 ml/sec.

Conclusions: Transurethral ventral BMG inlay urethroplasty is a feasible option for treatment of FNS. This novel surgical technique is an effective treatment alternative for men with distal urethral strictures. In this initial multi-institutional experience, 92.5% of patients were recurrence-free at intermediate-term followup. This single-stage technique allows for avoiding skin incision or urethral mobilization. It helps to prevent glans dehiscence and fistula formation, and avoids the use of genital skin flaps especially in patients affected with lichen sclerosus.

MP5-13. Table 1. Clinical characteristics

Mean Age, years (range)	53 (17–75)
Mean BMI, kg/m² (range)	29 (19–46)
Diabetes	19%
Smoking	25%
Etiology	
Lichen sclerosus	40%
Instrumentation	25%
Trauma	15%
Unknown	7.5%
Hypospadias	7.5%
Idiopathic	5%
Prior failed dilations	70% (0–10)
Prior DVIU	9%
Prior urethroplasty	23%
Stricture length, cm (range)	2.2 (1–5)

MP5-14

Trends in the utilization of partial adrenalectomy over time

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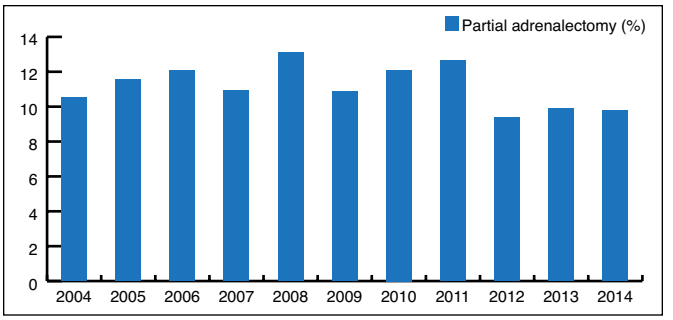
Introduction: The role of partial adrenalectomy has been established with equivalent oncologic outcomes and the avoidance of steroid replacement therapy. We hypothesize that the proportion of partial adrenalectomies has increased over time.

Methods: The National Cancer Database Endocrine Tumor Participant Use File was queried to identify all primary adrenal surgeries between 2004 and 2015 in the United States at participating institutions. Using surgical codes partial adrenalectomies were identified. The proportion of partial adrenalectomies was plotted over time.

Results: 581 partial adrenalectomies were performed between 2004 and 2015. The mean proportion of partial adrenalectomies performed between 2004 and 2015 was 11.4%. The minimum performed was 9.7% in 2013 and the maximum was 13.3% in 2009.

Conclusions: We did not find an increased trend in the utilization of partial adrenalectomy. Further study is warranted to understand the lack of adoption of this established treatment.



MP5-14. Fig. 1. Proportion of partial adrenalectomies performed by year.

MP5-15

Does incorporation of robot-assisted intracorporeal neobladder impact health-related quality of life outcomes? A matched analysis

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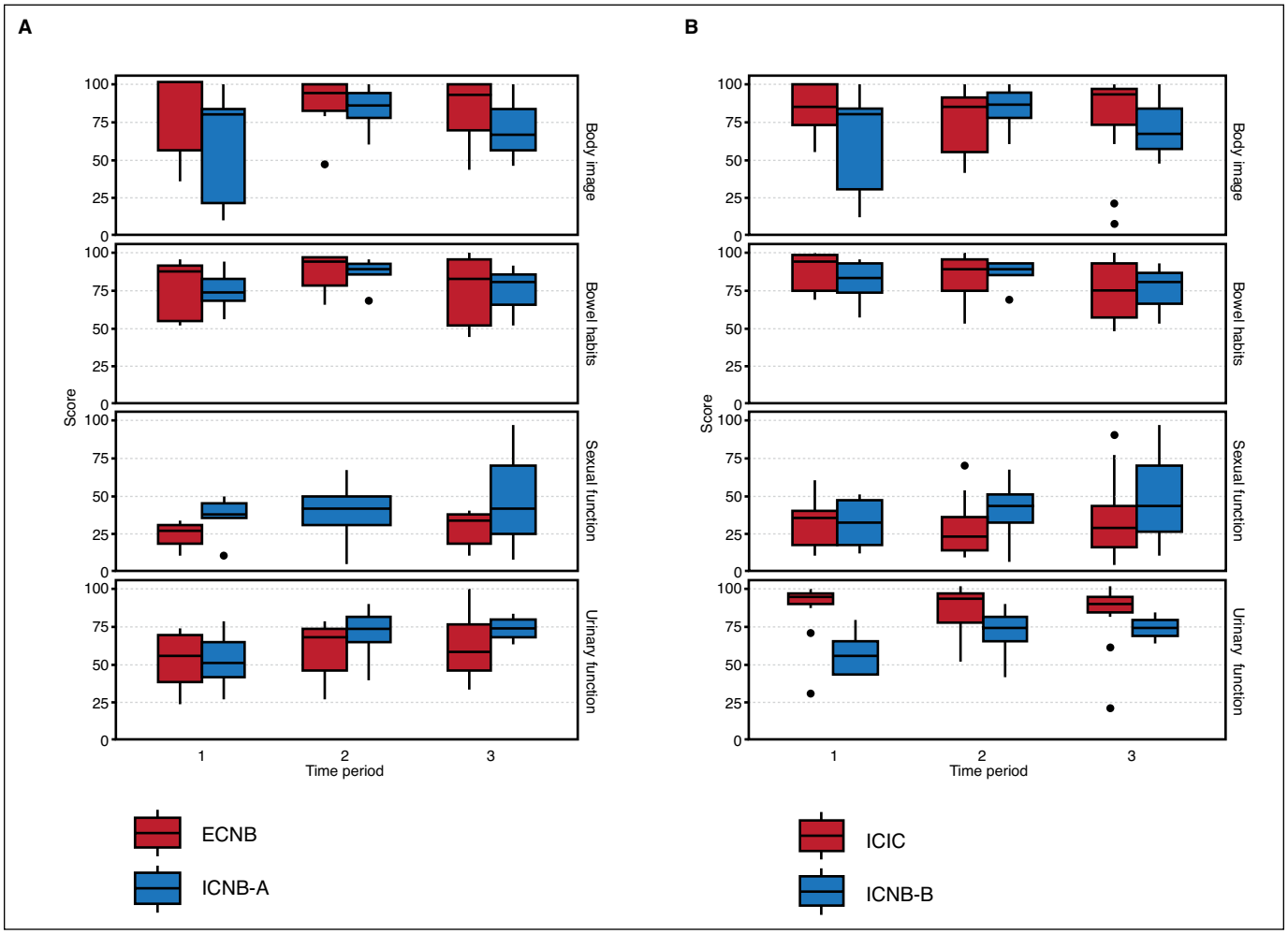
Roswell Park Comprehensive Cancer Center[1]; Roswell Park Cancer Institute Department of Urology[2]; University at Buffalo[3]; State University of New York at Buffalo[4]



MP5-15. Fig. 1.

Introduction: Intracorporeal orthotopic neobladder substitution has been incorporated in clinical practice with changes in technique to assist with robot-assisted approach. There is lack of sufficient evidence for the equality of patient-related results with this novel over the traditional open approach. We aimed to perform a matched comparison between different types of diversion after robot-assisted radical cystectomy (RARC).
Methods: Retrospective review of patients who underwent RARC in our institution was performed. Patients were divided into 3 groups: intracorporeal neobladder (ICNB), extracorporeal neobladder (ECNB), intracorporeal ileal conduit (ICIC). Propensity score match for patient and disease characteristics was performed. QoL was assessed using the Bladder Cancer Index (BCI, and European Organization for Research and Treatment of Cancer Body Image scale (BIS) questionnaires were used to evaluate health-related QoL at 3 time points after RARC: early (3–6 m), intermediate (6–12 m), and late (>12 m). ICNB was compared to ECNB, then another comparison between ICNB and ICIC was performed. Logistic regression model was used to evaluate predictors of better QoL for all domains at each time point.
Results: 11 patients in each of the ICNB and ECNB groups and 22 patients ICIC were identified. There was no significant difference in perioperative and pathologic outcomes between all groups. Compared to ECNB, ICNB was not inferior in urinary, bowel, sexual function, and body image domains at all time points (Fig. 1A). On the other hand, urinary function scores in ICIC was significantly better than ICNB (94 vs. 54; p=0.006) early after surgery, but this difference decreased with time (92 vs. 73; p=0.06 at 6–12 months) and (90 vs. 73; p=0.20 at >12 months) (Fig. 1B). Early after RARC, type of diversion (ileal conduit, mean +30 points) was associated with better urinary function scores. On intermediate followup, males demonstrated higher urinary function scores. The effect of these 2 variables diminished after 1 year of followup.
Conclusions: Incorporation of ICNB (initial experience and technique evolution) were not associated with changes in QoL after RARC. The difference between ICNB and ICIC diminished at 1 year.

MP5-16
Does early Foley catheter removal lead to earlier discharge times?

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Introduction: Healthcare costs in the United States continue to rise, with inpatient hospitalizations representing a significant portion of spending. Decreasing hospital length of stay (LOS) has been identified as a potential cost saving measure. Inpatient management of indwelling Foley catheters (FC) potentially represents a target for intervention. Common sense would dictate that earlier FC removal could reasonably lead to earlier discharge times and therefore, shorter LOS. This has been borne out in several studies, where early FC removal after surgery has been associated with shortened LOS, mostly in the setting of enhanced recovery after surgery (ERAS) protocols. This study aims to determine whether early FC removal in a general inpatient population is associated with earlier discharge times.
Methods: A retrospective chart review of 798 patients admitted to a tertiary care center from July 2016 to December 2016 that required FC placement. Baseline demographics and data specific to LOS, FC placement, and FC removal were collected. Patients who were discharged greater than one day after FC removal were excluded. The primary outcome measured was same-day discharge after FC removal. Logistic regression models were constructed for identification of factors associated with same-day discharge.
Results: 3499 patient encounters were identified, of which 798 met the inclusion criteria. Median age was 61 years (range 16–98) and 69.6% were admitted to a surgical service. Discharge was completed on the day of FC removal in 31.0% of patients. Median FC removal time was 9:45 am (IQR 7:48–12:00). Admission to a surgical service was associated with earlier FC removal times (p<0.05), with median removal times of 8:50 am for surgical patients and 11:10 am for medical patients. FC removal prior to 9, 10, or 11 am was not associated with increases in same-day discharge (p=0.543, p=0.593, and p=0.710, respectively). Late FC removal after 2 pm was also not associated with a decrease in same-day discharge (p=0.163).
Conclusions: Early FC removal has been shown to be beneficial in reducing LOS for patients following ERAS protocols. It remains to be seen whether FC removal time is temporally related to a delay in discharge in general inpatient populations. Patients admitted to surgical services are more likely to undergo early FC removal, however, the time of FC removal did not appear to be associated with a same-day discharge.

MP5-17
Intraoperative technical event mapping in open and robotic partial nephrectomy: Two roads to the same destination

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Introduction: While open partial nephrectomy (OPN) has been considered the "gold standard," the use of robotic partial nephrectomy (RPN) has been steadily increasing. It is currently unknown whether the visual and motor enhancements of the robotic system result in improved intraoperative performance and patient safety. We sought to examine the frequency and type of intraoperative events in OPN and RPN using the Generic Error Rating Tool (GERT), a validated technical performance assessment tool.
Methods: We prospectively collected intraoperative video of OPN and RPN from 12 different surgeons at 3 quaternary care hospitals from January 2016 to December 2017 in Toronto, Canada. Intraoperative events were rated using the GERT by 3 surgeons trained in video rating. We analyzed the number, type, and severity of events for OPN and RPN overall and by procedural step. We performed multivariable linear regression to examine the predictors of overall number of severe and intermediate events. Our primary exposure variable was surgical method. Other predictors included patient comorbidities, tumor factors, and the overall Objective Assessment of Technical Skills (OSATS) score.
Results: Overall 83 videos (36 open and 47 robotic) from 12 different surgeons were rated using the GERT. In total, 169 severe events occurred in 83 cases. Bleeding was the most common type of event, accounting for 90% of events. On univariate analysis, OPN had three times as many severe bleeding events compared to RPN (2.5 per case vs. 0.8 per case). On multivariable analysis, using a robotic technique for partial nephrectomy resulted in 1.8 fewer severe intraoperative events per case than open surgery (B=1.8; 95% CI 1.0, 2.6).
Conclusions: Performing partial nephrectomy robotically results in a lower number of severe events compared to OPN. Furthermore, most events occur during dissection and reconstruction steps. While this suggests that RPN could be a safer surgery compared to OPN, future studies should examine the relationship between GERT assessment and patient safety.

MP5-18
Effects of Rezūm® on lower urinary tract symptoms, with a focus on urgency: A single-center, prospective analysis

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Introduction: Rezūm® is an office procedure using convective thermal energy that is used in the treatment of benign prostatic hyperplasia (BPH). We studied the effects of one-time treatment with Rezūm in a single office setting. We hypothesize both an improvement in QOL and overall urinary symptoms, with urgency improving the least.
Methods: A prospective review of 46 consecutive patients from a single urologist office who underwent one-time treatment of Rezūm was performed. Our primary outcomes are the interval change of International Prostate Symptom Score (IPSS) and quality of life (QOL). Our secondary outcomes include changes in post-void residuals (PVR), max flow rate (Qmax), and the severity of individual lower urinary tract symptoms (LUTS) from the IPSS questionnaire. Baseline IPSS, QOL, and PVR data was collected from 41 patients prior to treatment. Of the same 41 patients from which baseline data was collected, follow up occurred at 0–3 months (n=22), 3–6 months (n=28), and 6–9 months (n=9) intervals.

The baseline data was compared using t-tests, with the measures collected at those 3 intervals post-Rezūm.
Results: The initial QOL score was a 3.9 and decreased (improvement) significantly at 3–6 months (2.5; p=0.002) and at 6–9 months (2.2; p=0.0056). Baseline IPSS of 20.6 steadily decreased at 0–3 months (15.6; p=0.016), at 3–6 months (10.3; p <0.0001), and at 6–9 months (9.6; p =0.00046). PVR improved from baseline at each of the 3 intervals from an initial 229 ml, with the greatest reduction at 3–6 months (85.8 ml; p =0.0011). Qmax improved from an initial 8.1 ml/s at 10.2, 9, and 15.4 ml/s, respectively, but none were statistically significant. Of the individual components of the IPSS, the most bothersome at baseline was urgency. All symptoms improved at each interval compared to baseline. At 0–3 months post-Rezūm, the two symptoms that improved significantly were weak stream (p=0.029) and straining (p=0.0044). All symptoms improved significantly at 3–6 months, with the greatest being intermittency and the lowest being nocturia. At 6–9 months, urgency did not improve significantly compared with the other symptoms. The greatest improvement at 6–9 months was incomplete emptying.
Conclusions: One-time, in-office treatment with Rezūm provides significant improvements of LUTS and QOL in patients with BPH, as hypothesized. Furthermore, as expected, our data shows least improvement in urgency at greater than 6 months after treatment. Rezūm also improves PVR and Qmax to a lesser extent, and remains an effective alternative to other surgical treatments of BPH.

MP5-19
Does a learning curve exist for treating lower urinary tract symptoms with Rezūm®?
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Introduction: Rezūm® is a minimally invasive treatment for benign prostatic hyperplasia (BPH). As in all surgical procedures, physician training and variability may have an effect on patient outcomes. We evaluated whether a single urologist using Rezūm produced differences in patient outcomes, based upon when they received treatment, to assess whether a learning curve exists. Our hypothesis is that Rezūm is a relatively uncomplicated procedure for which a provider can be effectively trained and produce consistent results.
Methods: Our data was collected from 46 consecutive patients in a single office setting where one-time treatment with Rezūm was performed. Baseline data including International Prostate Symptom Score (IPSS) and quality of life (QOL) were measured as surrogates for disease burden, for a separate prospective analysis. Using the same patient set, QOL scores (n=21) and IPSS scores (n=22) were collected at baseline and at 0–3 months followup. Additional followup IPSS and QOL scores (n=26) were recorded at 3–6 months. Significant patients (n=15, 71%) from the first interval followed up at the second interval as well. Patients were allocated 1:1 into two groups on whether they were the first set to receive treatment without considerable experience, or a second set to receive treatment after 2–3 months of experience. Comparisons between the changes in QOL and IPSS scores were made, using t-tests, between the two groups at both interval followups.
Results: The change in QOL 0–3 months after treatment did not vary significantly (p=0.835), between the first 11 to have been treated and the next 10. Of note, at 3–6 months followup, both QOL and IPSS scores had improved significantly compared to baseline, but this improvement was not dependent on when treatment was given. The first group (n=13) had the same improvement in QOL at 3–6 months (p=0.910) as the second group (n=13). Differences in IPSS scores at 0–3 months and 3–6 months post-Rezūm were not significantly different in either group (p=0.757 and p=0.544, respectively). In order to control for variability, IPSS scores and QOL were shown to be similar in all groups, at baseline and at both interval followups. Likewise, factors such as initial prostate size and number of injections were shown to have no discrepancy among all groups.
Conclusions: Our evidence shows that patients had no difference in outcomes whether they received treatment early in the physician's training with Rezūm or after sufficient exposure. Rezūm has shown to have relatively few risks and is becoming a cost-effective, practical, and effective alternative to other surgical options for the treatment of BPH.

MP5-20
Evaluation of leadership and communication skills among graduating Canadian urology residents
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Introduction: The leader and communicator roles are 2 of the 7 roles identified by the Royal College as part of the framework of abilities that are essential to graduating residents. However, as of yet, there is no objective way of evaluating these roles. The goal of our study was to assess the leader and communicator roles in graduating urology residents using a validated self-assessment form developed for business students.
Methods: Chief residents (n=36) were evaluated with 2 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. The same surveys were administered through email to the residents' program directors in a blinded fashion to see if program directors agreed with the residents' self- assessment. The response rate for program directors 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 program directors of their own residents' skills.
Conclusions: This objective way of evaluating the leader and communicator roles reveals that graduating urology residents score better than business students in communication but lower in management skills. Self-assessments by residents did not differ much from evaluations by their program directors.

MP5-21
Understanding implicit bias and its potential impacts in urology
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Introduction: Implicit bias is a well-described psychological mechanism of how a person's attitudes and stereotypes can impact their perceptions and subsequent actions. These experiences are gathered passively and manifest in the everyday world unconsciously. Gender and racial disparities in healthcare are also convincingly documented in medical literature, but most all providers would say they would not actively treat one group unfairly from another. Investigating and understanding how one would unconsciously act differently than they believe their morals would direct them is necessary to ensure all groups get the equal care they deserve.
Methods: Literature from medical, as well as social science journals, were reviewed from peer-reviewed data and studies. Personal discussions were had with community leaders about their ideas on the etiology and potential fixes for implicit bias in healthcare delivery.
Results: A large body of data exists showing disparities in healthcare delivery to non-whites and females in many circumstances. Implicit bias has been proven to exist in controlled research models using physicians as test subjects. Potential reversal strategies for implicit biases have been shown to be effective, such as having open discussions about the topic with their contemporaries and being actively conscious of possible biases going into patient interactions. There is a paucity of data, however, looking into implicit biases impacts in urology.
Conclusions: Disparities in care based on race and gender, as well as implicit biases in healthcare delivery, are proven entities, despite individual providers not having explicit biases. This is likely due to a systems issue and societal treatment of different groups, which can trickle down and eventually impact the end target patient-provider dynamic. There are various techniques to address and limit implicit bias in healthcare delivery if the provider, as well as the rest of their team, is willing to actively attempt to change. These strategies are starting to be investigated in the urology realm.

MP5-22

Early postoperative outcomes of transfeminine genital reconstructive surgery using a modified vaginoplasty technique

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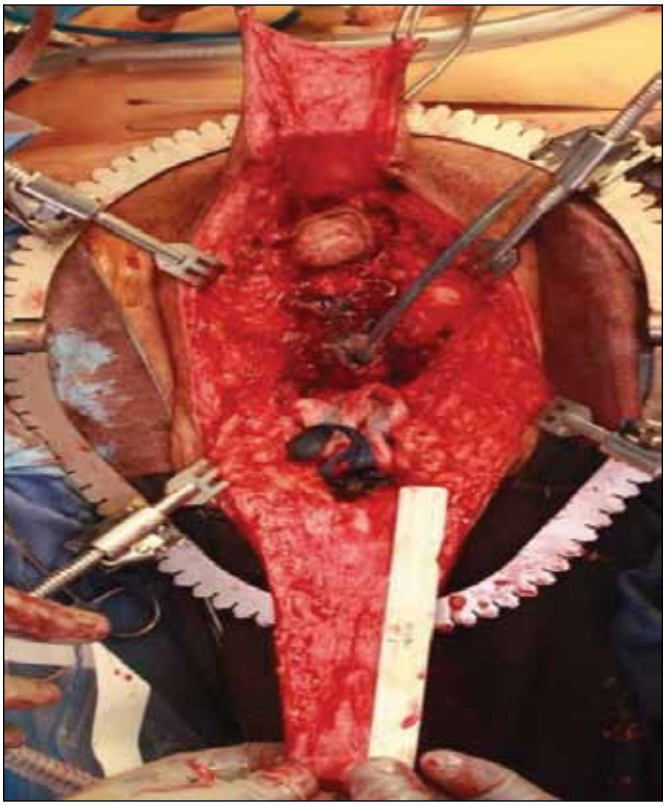
Introduction: Transfeminine genital reconstructive surgery is an important part of gender affirmation for many transwomen. Currently, there are several different techniques performed for the creation of a neovagina, including penile inversion and intestinal vaginoplasty. Surgical outcomes have been previously reported, however, patient-reported outcomes are limited. The aim of this study is to further investigate patient-reported outcomes of a robotic-assisted double flap vaginoplasty technique developed at SUNY Upstate Medical University.

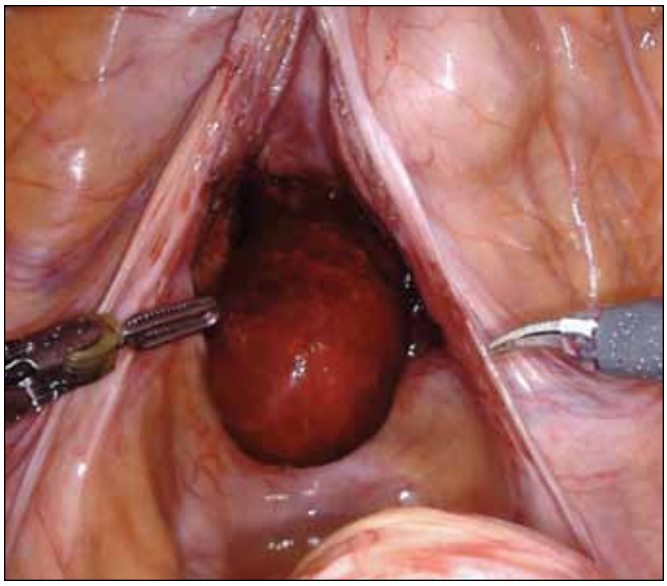
Methods: All patients who underwent transfeminine genital reconstructive surgery at our institution from September 2017 to April 2018 were identified. All patients who presented to a followup office visit were asked to fill out a set of questionnaires, including Global Response Assessment (GRA), Female Genital Self Image Scale (FGSIS), and Surgical Satisfaction Questionnaire (SSQ-8).

Results: A total of 8 patients pursued transfeminine genital reconstructive surgery between September 2017 and April 2018. One patient was lost to followup due to out-of-town status. The average time from surgery to followup was 11 weeks. 4 of 7 patients reported that the surgery markedly improved the condition of their genitalia. In addition, the majority of patients reported they felt positive about their genitals, were satisfied with the appearance of their genitals, and thought their genitals worked the way they were supposed to work. Compared to biological women, the results were comparable for all categories of the FGSIS. All patients stated they would likely recommend the surgery to someone else.

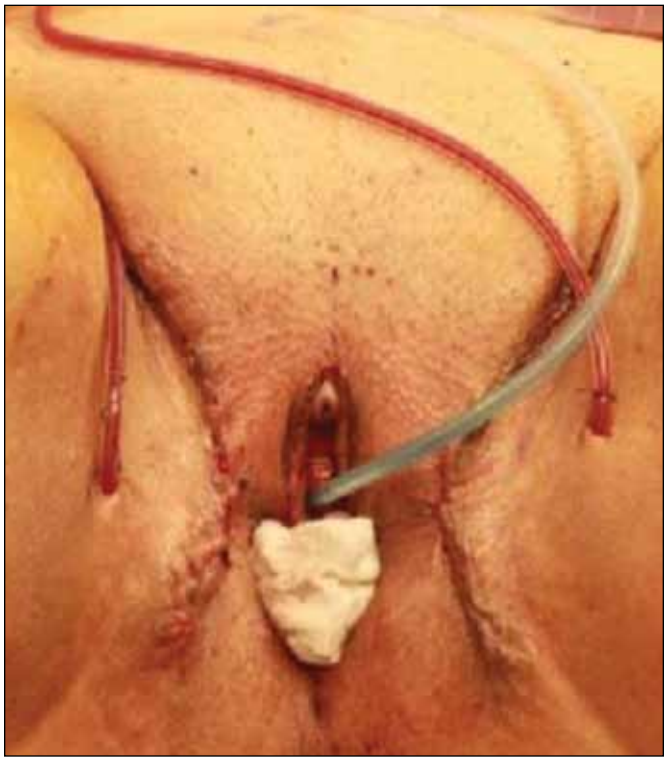
Conclusions: At our institution, early postoperative outcomes of patients who underwent the modified vaginoplasty technique showed that the majority of patients were satisfied with the functional and esthetic results.



MP5-22. Fig. 1. Double flap vaginoplasty.



MP5-22. Fig. 2. Robotic dissection for creation of vaginal cavity.



MP5-22. Fig. 3. Postoperative image.

Moderated Poster Session 6: Oncology – Prostate

Moderators: Oussama M. Darwish, MD, University at Buffalo-VA Western NY Healthcare System; Hani H. Rashid, MD, University of Rochester Medical Center, Rochester, NY

MP6-01
Utilization of SpaceOAR during prostate brachytherapy

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Introduction: SpaceOAR is a hydrogel that is inserted between the anterior rectal wall and posterior prostate with the goal of reducing the radiation dose delivered to the rectum after prostate brachytherapy. The present study reports data on usage of SpaceOAR on patients undergoing Cesium 131 prostate brachytherapy at a single institution.

Methods: Patients undergoing combination therapy (external beam radiation followed by prostate brachytherapy) had SpaceOAR placed at the time of the prostate brachytherapy procedure in hopes of reducing the bowel morbidity commonly associated with this procedure. Morbidity was assessed using the Expanded Prostate Cancer Index Composite (EPIC) bowel surveys. Patients were followed for 18 months. EPIC scores were evaluated at 2 and 4 weeks as well as 3, 6, 9, and 12 months.

Results: 42 patients were included in the study. 16 (38%) patients had intermediate-risk prostate cancer and 26 (62%) had high-risk prostate cancer. All patients underwent both EBRT and prostate brachytherapy. The mean EPIC preoperative bowel summary score was 90.6. The mean postoperative EPIC bowel summary score was 74.6 two weeks after the procedure and returned to 90.9 at four weeks after the procedure. EPIC bowel bother score was 89.5 preoperatively, decreased to 73.0 at two weeks and increased to 92.1 four weeks after the procedure. EPIC bowel function score was 91.8 preoperatively, decreased to 76.1 at two weeks and increased to 89.7 four weeks after the procedure. EPIC scores at 12 months for bowel summary, bowel bother, and bowel function were 92.9, 91.1, and 94.6, respectively.

Conclusions: The present study demonstrates promising results in limiting bowel morbidity with the use of SpaceOAR in patients undergoing external beam radiation therapy followed by prostate brachytherapy. Our results demonstrate minimal bowel morbidity after the procedure with a quick return to baseline which was maintained one year after completion of radiation.

MP6-02
Fluorescent androgens can be used to track androgen metabolism in prostate cancer

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Roswell Park Comprehensive Cancer Center[1]

Introduction: Men with advanced prostate cancer (CaP) receive androgen-deprivation therapy (ADT), which lowers circulating testosterone (T) levels, impairs androgen receptor (AR) activation and CaP regresses. However, ADT is palliative and CaP recurs as lethal castration-recurrent/resistant CaP (CRPC). One mechanism that provides CaP resistance to ADT is intratumoral synthesis of dihydrotestosterone (DHT) that occurs via the front-door and primary and secondary back-door androgen metabolism pathways. Androgen metabolism enzyme inhibitors, such as dutasteride or abiraterone, impair enzyme activity and lower CaP tissue T or DHT levels. CaP cells switch androgen metabolism pathways to overcome inhibition and maintain T or DHT levels sufficient to activate AR. When CaP cells change androgen metabolism and which pathways are preferred to overcome inhibition remains unknown. The objective was to characterize androgen metabolism using fluorescent coumarin-labeled androgens.

Methods: Androgen sensitive LAPC-4, VCaP and LNCaP, castration-recurrent CWR-R1 and 22rv1, and androgen-independent PC-3 cell lines were used. ImageStream, a hybrid technique of flow cytometry and fluorescent-microscopy, was used to assess CaP cell uptake of fluorescent-androgen derivatives of androsterone, androstanedione, androstanediol, or dihydrotestosterone. Liquid chromatography-tandem mass spectrometry (LC-MS/MS) was used to measure androgen and fluorescent-androgen metabolism. 3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide (MTT) was used to assess cell growth and quantitative real-time polymerase chain reaction (qRT-PCR) was used to determine if kallikrein-related peptidase 2 (KLK2) and prostate-specific antigen (PSA), were upregulated.

Results: ImageStream revealed all four fluorescent-derivatives were taken up by all CaP cell lines. LC-MS/MS revealed fluorescent-androsterone and fluorescent-androstaneidol were metabolized to fluorescent-5α-dione or DHT, respectively. Fluorescent-DHT maintained CaP growth during androgen deprivation by serum-free complete media and stimulated AR-regulated gene transcription, as measured using MTT and qRT-PCR analysis, respectively.

Conclusions: Fluorescent androgens synthesized using coumarin produced functional fluorescent androgens that were recognized by appropriate enzymes, maintained CaP survival during androgen deprivation, and stimulated AR activation. Fluorescent androgens can be used to monitor cell line and probably CaP xenograft androgen metabolism.

MP6-03
Outcomes of radical prostatectomy following initial active surveillance

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University Health Network[1]; University of Toronto[2]; Loma Linda University Health[3]; Princess Margaret Cancer Center/University Health Network[4]; University Health Network/Surgical Oncology[5]; Schulich School of Medicine[6]; Sinai Health System[7]; Princess Margaret Cancer Center[8]; Division of Urology, University Health Network[9]

Introduction: We aimed to provide long-term oncologic outcomes for men with prostate cancer (PCa) progressing on active surveillance (AS) to radical prostatectomy (RP).

Methods: Men on AS (1995–2011) for PCa progressing to RP, initial cohort n=41, were matched to age and prostate-specific antigen (PSA) matched men undergoing immediate RP after a diagnosis of low-risk disease who were candidates for AS (group 1) and men with de novo Gleason 7 disease (group 2) to determine whether patients on AS have potentially adverse oncologic outcomes. Additionally, we report pathologic findings in all men on AS (1992–2015) progressing to RP (till 7/2017), overall cohort n=294.

Results: 294 patients on AS underwent RP after a median of 29.06 months (IQR 17.4–48.2) after diagnosis. The majority of patients (70%) had T2 disease, GS ≤7 (96%) and negative surgical margin (77%). The cumulative rate of adverse pathology was 40% (119/294). On univariate logistic regression model, age and PSA at diagnosis were predictors of adverse pathology at RP, however, on multivariate model, age was the only significant predictor of adverse pathology. In the overall cohort, at a median of 6.5 years (IQR 4.7–8.9) from RP, BCR was 10%. In the initial cohort, patients progressing to Gleason 7 on AS did not demonstrate a higher BCR compared to control group 2 (8% vs. 28%; p=0.04). Nine patients died,1 prostate cancer-related,

and 2 patients are currently being treated for metastatic disease during followup. There was no difference in oncological outcomes (BCR, OS, and CSS rate) between delayed RP and immediate RP cohort.
Conclusions: Radical prostatectomy after a period of active surveillance does not appear to result in adverse oncological outcomes compared to patients with a similar preoperative risk.

MP6-04

Internal validation and correlation of two different PSA assays for prostate cancer screening in community-based men

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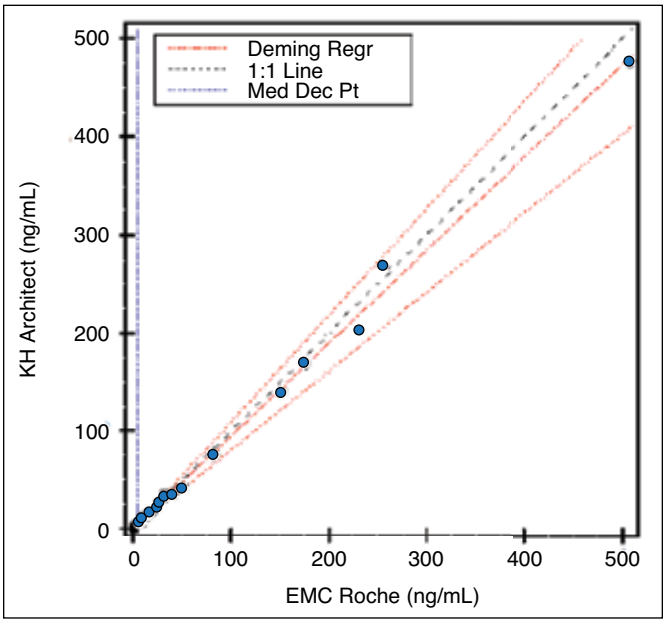
Introduction: The prostate-specific antigen (PSA) test is a blood test used in the diagnosis and management of prostate cancer. There are over 20 PSA assays in use in the U.S., and studies have been mixed regarding correlations between PSA assays. Two different assay have been used within two local hospital systems that have merged laboratory operations. Our goal is to define how comparable these assays are and present it from a clinical perceptive to urologists.
Methods: With IRB approval, a prospective review was performed, focusing on males 45 years of age and older who underwent serum PSA testing at our laboratory facilities from March 1 to June 1, 2014. Specimens were processed using the Abbott Architect total PSA and the Roche Modular Analytics E170 total PSA. Inclusion criteria included PSA values obtained at both facilities from March 1, 2014 to June 1, 2014. Exclusion criteria included PSA values that were "undetectable" by either assay test. The data was analyzed using Deming and linear regression analysis.
Results: 441 serum samples were collected within the 4-month inclusion period, with 414 PSAs fitting the inclusion criteria, from the de-identified database. The data was stratified by PSA <4 ng/ml (n=367), 4–10 ng/ml (n=33), and PSA 10 ng/ml (n=14). Deming regression analysis of the data was performed yielding a R^2 of 0.997, with a standard error of 1.657. The subgroup regression analysis was as follows: PSA <4 ng/ml had a R^2 of 0.974 with a standard error of 0.15. PSA 4–10 ng/ml had a R^2 of 0.852 with a standard error of 0.65. PSA >10 ng/ml had a R^2 of 0.986 with a standard error of 2.22.
Conclusions: The PSA range that urologists are most concerned with in prostate cancer screening is 4–10 ng/ml. Our data would suggest that at best an 85% correlation exists between the two assay tests within this range. For a physician following individual patients longitudinally, this relationship is too weak to recommend interchanging the tests with confidence. Additionally, we describe a successful model for use when combining laboratories using disparate assays, perhaps even to generate conversion factors between assay tests.



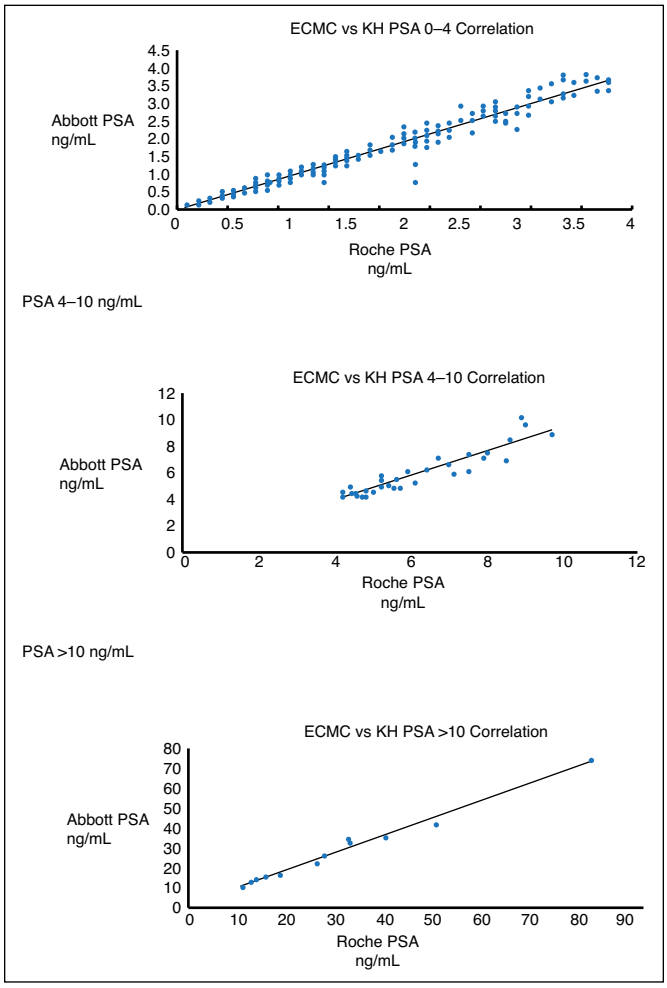
MP6-04. Fig. 1.

MP6-05

Obesity and metabolic syndrome correlate with earlier biochemical recurrence in high-risk prostate cancer patients who underwent robotic-assisted laparoscopic prostatectomy

A. Samiei[1], R. Miller[1], J. Lyne[1], J. Cohen[1], S.S. Mao[2]
Allegheny Health Network, Division of Urology[1]; Allegheny Health Network, Cancer Institute[2]

Introduction: Obesity and metabolic syndrome (MetS) have become widespread in our society, and have been linked to a higher incidence of prostate cancer (PCa), but the relationship of BMI to treatment outcome has yielded mixed results. There are a lack of comparative studies investigating the association between obesity or MetS and biochemical recurrence (BCR) following robotic-assisted laparoscopic prostatectomy (RALP). We examined the correlation between timing and incidence of BCR with MetS and BMI in a cohort of patients with high-risk PCa who underwent RALP.
Methods: A retrospective study of 726 patients who underwent RALP at a single center from 2007–2015 was conducted. Parameters including pre-



MP6-04. Fig. 2.

operative BMI, fasting glucose, lipid profile, blood pressure, PSA, Gleason score, pathologic stage, time to BCR, and surgical margin status were analyzed. High-risk was defined according to the National Comprehensive Cancer Network (NCCN) guideline. WHO classification was used for MetS criteria, and BCR was defined as two consecutive PSA levels ≥0.2 ng/mL postoperatively.

Results: A total of 189 high-risk patients were included in this study with the median age of 60 (interquartile range [IQR] 56–65) years old. The median followup from surgery was 34 (IQR 21–54) months. Obesity (BMI ≥30) and MetS were found in 46.5% and 40.7% of patients, respectively. BCR was observed in 52.3% of patients, with the median time to BCR of 9 (IQR 3–15) months. Patients with BMI ≥30 relapsed earlier than those with BMI <30 with the mean time to BCR of 9.5 vs. 15 months (p=0.032). The difference of BCR rate was consistently observed at 6 months (14.3% vs. 8.4%; p=0.015), at 12 months (19.5% vs. 14.2%; p=0.025), and at 24 months (24.3% vs. 18%; p<0.01) from the time of surgery. The presence of MetS also correlated with a shorter time to BCR (9.8 vs. 15.2 months; p=0.04). The BCR rate was significantly higher in those with MetS compared to those without at 6 months (14.2% vs. 8%; p=0.02), at 12 months (21.7% vs. 11.6%; p<0.01), and at 24 months (29.6% vs. 12.2%; p=0.01) from the time of surgery. There was no statistical difference between positive surgical margin in obese and non-obese patients (23.8% vs. 18.5%; p=0.15).

Conclusions: Obesity and MetS increased the risk of BCR with shorter time to BCR in high-risk PCa patients following RALP. This difference was seen independent of margin status, suggesting a potential interplay between obesity/MetS and cancer progression following extirpative surgery for PCa.

MP6-06

The impact of the location of the positive surgical margin on oncological outcome in intermediate-risk prostate cancer patients

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Introduction: The presence of positive surgical margin (PSM) at radical prostatectomy (RP) has been linked to potential disease recurrence. However, not all of those patients with PSM develop biochemical recurrence (BCR). Therefore, the oncological implication of PSM at RP is not well-defined. We investigated the association of BCR with the location of the PSM in intermediate-risk PCa patients who underwent robotic-assisted laparoscopic prostatectomy (RALP) or open radical prostatectomy(ORP).

Methods: We retrospectively reviewed the records of 677 patients with intermediate-risk PCa who underwent RP(466 RALP and 211 ORP) in a single center from 2003–2015. Parameters, including PSA, Gleason score, pathologic stage, BCR, the number and location of PSM, including apical (AP), bladder neck(BN), or peripheral (Peri) margin, were analyzed. Intermediate-risk was defined according to the National Comprehensive Cancer Network (NCCN) guideline. BCR was defined as a two consecutive rise of postoperative PSA level ≥0.2 ng/mL.

Results: Among 677 patients, 131 (19.3%) had a PSM. The median followup time was 45 months (interquartile range [IQR] 17–71). The median age was 61 (IQR 56–66) years old. The PSM rate was comparable between RALP (90/466,19.3%) and ORP (41/211,19.4%) groups. In the RALP group, the most common site of single PSM was the AP (53.4%), followed by the Peri (25.5%) and BN (5.5%). Multifocal PSM was observed in 15.6% of patients. In the ORP group, the most common site of single PSM was Peri (39%), followed by AP (29.2%) and BN (7.3%). Multifocal PSM was observed in 24.5% of patients. There was less BCR in RALP than ORP (10.9% vs. 18.4%; p< 0.01) group among patients with PSM. BCR was significantly lower in patients with unifocal PSM in RALP group than ORP (19.7% vs. 40%; p=0.031). Although PSM in apex was more common in RALP group, less BCR was observed than in ORP group (18.7% vs. 50%; p<0.03). Peripheral PSM led to numerically less but no statistically different BCR in RALP group than in ORP group (17.4% vs. 31.2%; p=0.32). PSM in BN predicts high risk of BCR in both groups (40% and 33%). Multifocal PSM led to similar rate of BCR in both groups (14.2% and 18.1; p = 0.7).

Conclusions: Although RALP and ORP may lead to a similar rate of PSM, the rate of BCR is lower in RALP in our study. The unifocal (especially AP) PSM in RALP group resulted in less BCR compared to ORP group, perhaps partly due to improved dexterity in RALP and potentially more adequate resection. Bladder neck PSM represents higher risk for BCR in both groups.

MP6-07

Low incidence of microsurges in prostate cancer patients treated with polymer delivered, subcutaneously administered leuprolide acetate

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Introduction: In prostate cancer therapy, achieving and maintaining effective testosterone (T) suppression to the level attained with surgical castration is the cornerstone of androgen-deprivation therapy (ADT). Consistent drug delivery with long-acting leuprolide acetate (LA) formulations is important in providing continuous T suppression throughout the course of treatment without T rising above castration level (T breakthrough). Pivotal studies have shown treatment with polymer-delivered, subcutaneously administered LA (SC-LA) resulted in a low incidence of T breakthroughs (0-3.4%), which may have implications for improving survival free of progression. To assess the stable release of SC-LA and consistent control of T levels in prostate cancer patients, the incidence of microsurges was evaluated in 4 pivotal trials.

Methods: Eugonadal prostate cancer patients (age 40–86 years) who achieved medical castration (T <50 ng/dL) while on the first injection of SC-LA 7.5, 22.5, 30, or 45 mg, lasting 1, 3, 4, or 6 months, respectively, in 4 open-label, fixed-dose, pivotal trials were evaluated for microsurges (n=423). A microsurge was defined as an absolute increase in T level of at least 25 ng/dL during the 4-week period after the second study dose was administered. T was measured 2–4 times on day 0 and once on days 1, 3, 7, 14, 28, and 35 following the second injection. The 45 mg group had an additional measurement taken on day 2.

Results: Across individual studies, 0.9–3.4% of patients experienced a microsurge after the second SC-LA dose (Table 1). Of the 8 patients who experienced a microsurge, 6 (75%) remained castrated at the peak of the surge. Pooled analysis showed 1.9% of patients who achieved T <50 ng/dL before the second injection experienced a microsurge during the acute period after the second dose.

Conclusions: Subcutaneous leuprolide acetate achieves consistent and prolonged drug delivery, resulting in a very low incidence of T breakthroughs and microsurges in prostate cancer patients. Limiting the occurrence of T levels above the castration threshold may have clinical implications with respect to prolonged survival free of progression.

MP6-07. Table 1. Low T microsurge data

Formulation	1-month (n=113)	3-month (n=115)	4-month (n=88)	6-month (n=108)
Microsurge, % (n)	0.9% (1)	1.7% (2)	3.4% (3)	1.9% (2)
Microsurge with peak T>50 ng/dL, % (n)	0	0	2.3% (2)	0

MP6-08

PIRADS score and perineural Iinvasion detected on MR/US fusion biopsy predict performance of selection criteria for hemablative focal therapy in patients with Iintermediate-risk prostate cancer

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Introduction: MR/US fusion biopsy (FB) is used to guide patient selection for focal therapy (FT) in prostate cancer (PCa). However, the optimal selection criteria for FT are not well-understood. In patients who underwent FB followed by radical prostatectomy (RP) for intermediate-risk PCa, we assessed the performance of theoretical selection criteria for prostatic hemiablation (HA) and factors on biopsy that may predict failure of these criteria to adequately treat clinically significant disease.

Methods: In a retrospectively maintained, single-institution multiparametric MRI (mpMRI) database (n=1001), 290 patients were found who had undergone FB , including both targeted biopsy (TB) and systematic biopsy (SB). Clinico-pathologic variables were assessed on FB to determine who met theoretical selection criteria for HA, defined as unilateral intermediate risk PCa per NCCN criteria (Grade Group [GG] 2 or 3 with prostate-specific antigen [PSA] <20). Performance of the selection criteria was assessed by examining pathologic specimens in patients who also underwent RP (Table 1). HA selection failure on RP was defined as presence of contralateral GG≥2 or the presence of high risk disease (any GG≥4 or extraprostatic extension [EPE]).

Results: Of the 290 patients who underwent FB, 78 met our selection criteria for HA. Of 31 patients eligible for HA who also underwent RP, 20 had HA selection failure on final histopathology (positive predictive value of 0.32). Contralateral GG ≥2 alone was found in 9 cases, EPE alone in 6 cases, both EPE and contralateral GG ≥2 in 4 cases, and missed GG ≥4 in 2 cases. Perineural invasion (PNI) on SB (p=0.082) and PIRADS score (p=0.049) were both predictive of HA selection failure on univariable analysis (Table 1). PNI and cribriform on TB (p=0.013 and 0.034, respectively) both predicted only presence of EPE on RP. Positive predictive value of HA selection criteria improved to 0.67 when PIRADS 5 and PNI on FB were also excluded.

Conclusions: In an analysis of theoretical HA selection criteria in patients with intermediate-risk PCa on MR/US fusion biopsy who also underwent RP, presence of PNI on SB and higher PIRADS score predictive of HA selection failure based on final histopathology. PNI and PIRADS score should be taken into consideration when selecting patients for FT in prospective clinical trials.

MP6-08. Table 1. Clinical, pathologic, and imaging variables available after fusion biopsy assessed for correlation with performance of theoretical hemiablation selection on radical prostatectomy specimen

	Successful HA selection on RP (IQR)	Hemiablation selection failure on RP (IQR)	p
n	11	20	
Age, median years (IQR)	67.0 (61.3, 68.1)	67.44 (62.8, 71.5)	0.688*
PSA (ng/ml)	5.7 (5.1, 8.2)	8.50 (6.3,11.4)	1*
PSAD (ng/ml/ml)	0.11 (0.10, 0.19)	0.17 (0.11, 0.3)	1*
DRE, n			0.667**
Normal	10	19	
Abnormal	1	1	
MRI prostate volume, median ml	36.4 (29.5, 61.3)	51.1 (34.0, 67.0)	0.411*
PIRADS, n			0.049**
3	2	0	
4	6	10	
5	3	10	
Index lesion size, median mm	15.0 (11.5, 18.5)	14.0 (11.0, 18.3)	0.677*
MRI capsular abutment, n			0.472*
No	9	15	
Yes	2	5	
Overall grade Group on FB, n			0.432*
2	9	14	
3	2	6	
Max % core inv (SB)	5.0 (2.5, 30.0)	22.5 (5.0, 42.5)	0.174*
Max % core inv (TB)	20.0 (5.0, 30.0)	27.5 (5.8, 42.5)	1*
No pos cores (SB)	1.0 (0.5, 3.0)	2.0 (1.0, 3.0)	1*
No pos cores (TB)	2.0 (2.0, 3.0)	2.5 (2.0, 3.3)	1*
Crib present (SB), n			0.639**
No	9	12	
Yes	2	8	
Crib present (TB), n			0.472**
No	9	15	
Yes	2	5	
PNI present (SB), n			0.082**
No	10	10	
Yes	1	10	
PNI present (TB), n			0.429**
No	10	16	
Yes	1	4	

*Mann-Whitney U; **Chi-square.

MP6-09

Utilization of multiparametric magnetic resonance imaging in the Medicare prostate cancer population on active surveillance

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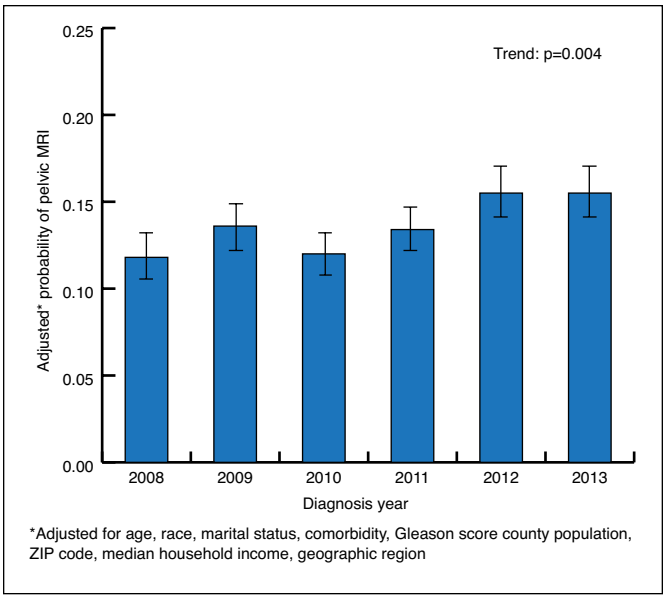
Department of Urology, University of Pittsburgh School of Medicine[1]; Department of Medicine, University of Pittsburgh School of Medicine[2]; UPMC[3]; University of Pittsburgh School of Medicin°e[4]; Department of Urology, Emory University School of Medicine[5]; Department of Radiology, University of Pittsburgh School of Medicine[6]

Introduction: Multiparametric magnetic resonance imaging (mpMRI) has emerged as an important tool that may improve risk stratification of prostate cancer patients entering active surveillance and decrease the need for repeated biopsies. However, the extent to which mpMRI has been used in active surveillance has not been well-established. We sought to characterize the utilization of mpMRI in active surveillance patients and to examine factors associated with its use.

Methods: Using Surveillance, Epidemiology, and End Results (SEER)-Medicare data, we identified patients with prostate cancer diagnosed between 2008 and 2013 managed with active surveillance. Patients were separated into two groups: active surveillance without mpMRI and active surveillance with mpMRI. A multivariable logistic regression model evaluated which patient factors were associated with receiving mpMRI.



MP6-09. Fig. 1. Adjusted* probability of active surveillance patients receiving mpMRI by year of diagnosis.

Results: We identified 9467 prostate cancer patients on active surveillance. 86% (n=8178) of active surveillance patients did not receive mpMRI, whereas 14% (n=1289) of active surveillance patients did receive mpMRI. Between 2008 and 2013, the probability of receiving mpMRI increased by 3.7% (p=0.004; test for trend) (Fig. 1). Multivariable analysis demonstrated that patients who were younger, white, married, healthier, had greater median income, lived in more populated communities, lived in the northeast or west, and had a more recent prostate cancer diagnosis were more likely to receive mpMRI (all p<0.03). Gleason score and education level were not associated with receiving or not receiving mpMRI (all p>0.6).
Conclusions: From 2008–2013, the use of mpMRI in active surveillance prostate cancer increased, with an overall usage rate of 14%. Future studies are warranted to examine barriers to mpMRI use, cost-effectiveness, and the efficacy of incorporating this imaging modality into active surveillance protocols.

MP6-10

Reverse stage migration in men undergoing radical prostatectomy: Association with the 2012 U.S. Preventive Services Task Force prostate cancer screening recommendation

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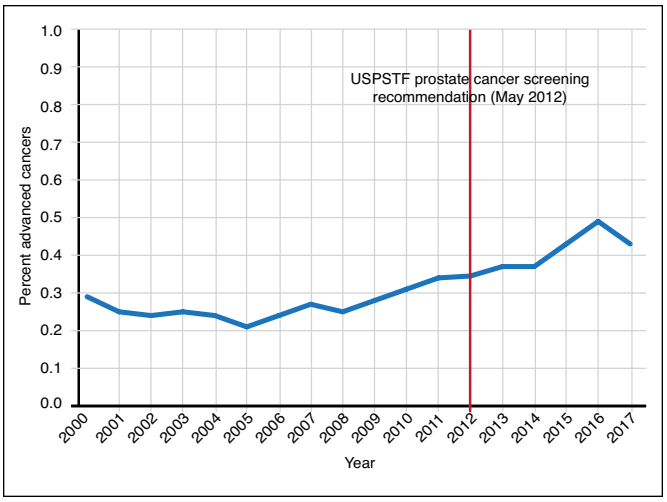
Introduction: In 2012, the United States Preventive Services Task Force (USPSTF) recommended against routine prostate cancer screening for all men. We aim to determine whether this recommendation is associated with reverse stage migration, wherein patients present with more advanced disease.
Methods: We conducted a serial cohort study using a prospective database of 3182 men undergoing radical retropubic prostatectomy (RRP) by a single surgeon from 2000–2017. The exposure of interest was publication of the USPSTF prostate cancer screening recommendation statement (May 2012). Our primary outcome was the rate of advanced cancer, defined as tumor stage ≥pT3 and/or nodal stage ≥pN1. We compared patients who underwent RRP before and after publication. We also performed sensitivity analyses to account for 1) publication of a draft recommendation in October 2011; and 2) adoption of active surveillance throughout the study period. We adjusted for active surveillance by excluding all clinically low-risk cancers. We fit a multivariable logistic regression model to



MP6-10. Fig. 1. Advanced pathologic stage by year.

determine the association between advanced cancer rates and publication of the USPSTF recommendation and advanced cancer, controlling for age and preoperative prostate-specific antigen (PSA).
Results: Patients who underwent RRP after May 2012 had significantly higher rates of advanced cancer (40% vs. 27%; p<0.0001). Similar results were obtained when accounting for the draft recommendation and recommendation adoption (39% vs. 26%; p<0.0001) and when accounting for active surveillance (47% vs. 40%; p<0.0001). On multivariable analysis, undergoing RRP after publication of the recommendation remained significantly associated with advanced cancer (OR 1.6; 95% CI 1.3–2.0).
Conclusions: We show reverse stage migration in men undergoing RRP toward more advanced cancers after publication of the 2012 USPSTF prostate cancer screening recommendation, which raises concern regarding abandoning screening practices. The 2018 update to the USPSTF prostate cancer screening recommendation may mitigate this effect.

MP6-11

The 17-gene RT-PCR prostate assay: Clinical experience in 29 000 patients with clinically low-risk prostate cancer

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Introduction: The 17-gene Oncotype DX® Genomic Prostate Score™ (GPS™ assay, Genomic Health Inc., Redwood City, CA) is a biopsy-based gene expression assay specifically developed for clinically low-risk prostate cancer (PCa): NCCN very low (VL), low (L), and favorable intermediate (Int). When combined with baseline NCCN risk, it has been clinically validated to predict the risk of adverse pathology (AP) at time of diagnosis to help guide informed treatment decisions, including active surveillance.
Methods: We present results based on 29 000 commercial samples that passed pathology review and RT-PCR quality measures. Lab failure rate for the GPS assay is <1% when the minimum tissue requirement is met and average turnaround time from sample receipt is 8.5 days (90% within 14 days). GPS result (scaled 0–100) was calculated based on a validated algorithm with 12 PCa-related genes across 4 pathways and 5 reference genes. Ordering physicians provided NCCN risk classification or clinical factors required for its calculation. Descriptive statistics for clinicopathologic variables were calculated.
Results: In the 29 000 reports issued, the median GPS result was 24 (IQR 17–33, range 0–100), with median values of 22, 22, and 29 for NCCN VL, L, and Int, respectively. 98% of submitted Gleason scores were ≤3+4. The median age was 65 years (range 30–93), with 55% ≥65. Of the patients whose NCCN classification was provided (n=28 366), 27% were VL, 39% L, and 34% Int risk. Overall, NCCN+GPS risk category was different from the original NCCN risk category for 26% of patients. In the

NCCN L group, half of patients had a different risk categorization after GPS testing, with 15% moved to Int and 35% to VL. The individualized risk of AP (high-grade [GS ≥4+3] or high stage [≥T3]) had a median of 14% (range 5–41%) for VL, 23% (range 10–64%) for L, and 43% (range 17–82%) for Int risk disease. Regardless of NCCN risk group, the average risk of AP by GPS quartiles was 18%, 24%, 31%, and 46%. The median risk of AP for age <65 was 23% (range 5–82%), while for age ≥65 was 28% (range 5–82%).

Conclusions: GPS results in the first 29 000 biopsy samples displayed a broad range of AP risk, confirming a wide spectrum of individual tumor biology within current clinical risk groups. Over one in four men tested had a resulting risk assignment that differed from his original NCCN risk group. Use of GPS testing improves risk refinement, and provides physicians and patients personalized information to guide informed treatment decisions for initial disease management.

MP6-12

Real-world use of radium-223 in patients with castration-resistant prostate cancer and bone metastases

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Introduction: Radium-223 dichloride (radium-223), an alpha-emitting agent that mimics calcium and preferentially targets bone metastases, is FDA approved for the treatment of metastatic castration-resistant prostate cancer (CRPC). However, it is less used compared to other agents, particularly those that target the androgen receptor pathway. We report our experience and outcomes of men with CRPC and bone metastases treated with radium-223.

Methods: We performed a retrospective analysis of men with CRPC and bone metastases that were treated with radium-223 at our center. We examined demographic information, radium-223 therapy details, overall survival, biochemical responses, and adverse events.

Results: A total of 60 patients were treated with radium-223 during our study period. Median age was 73 years; median PSA and ALP prior to radium-223 therapy were 99 mg/L and 154 U/L, respectively. The majority of patients had received previous therapies including docetaxel (62% of patients), abiraterone (72%), and enzalutamide (68%). Only 42% of patients had received all 6 cycles of radium-223. Median overall survival for patients receiving radium-223 was 8.2 months (Fig. 1A). Subgroup analysis showed that patients who had all 6 cycles of radium-223 (13.6 mo) compared to those who had <6 cycles (5.7 mo) had longer overall survival (HR 0.57; p<0.001) (Fig. 1B). Subgroup analysis with previous docetaxel, abiraterone, and enzalutamide use did not result in any change in overall survival. A total of 13 of patients (22%) who received radium-223 had a >25% reduction in PSA and 33 patients (55%) had a >25% reduction in ALP. There was a 72% adverse events rate and 42% grade 3–4 adverse events rate (Table 1). The most common adverse events included fatigue (42%), followed by anemia (32%), nausea (28%), diarrhea (17%), and thrombocytopenia (15%).

Conclusions: Radium-223 appears to be effective and well-tolerated in our patient population that had previous CRPC treatments, including docetaxel, abiraterone, and enzalutamide. Men who had all 6 cycles of radium-223 had better overall survival than those who did not. Larger prospective studies are required to validate our findings.

MP6-13

Use of subcutaneous low-suction frains for the prevention of wound-related complications in obese renal transplant recipients

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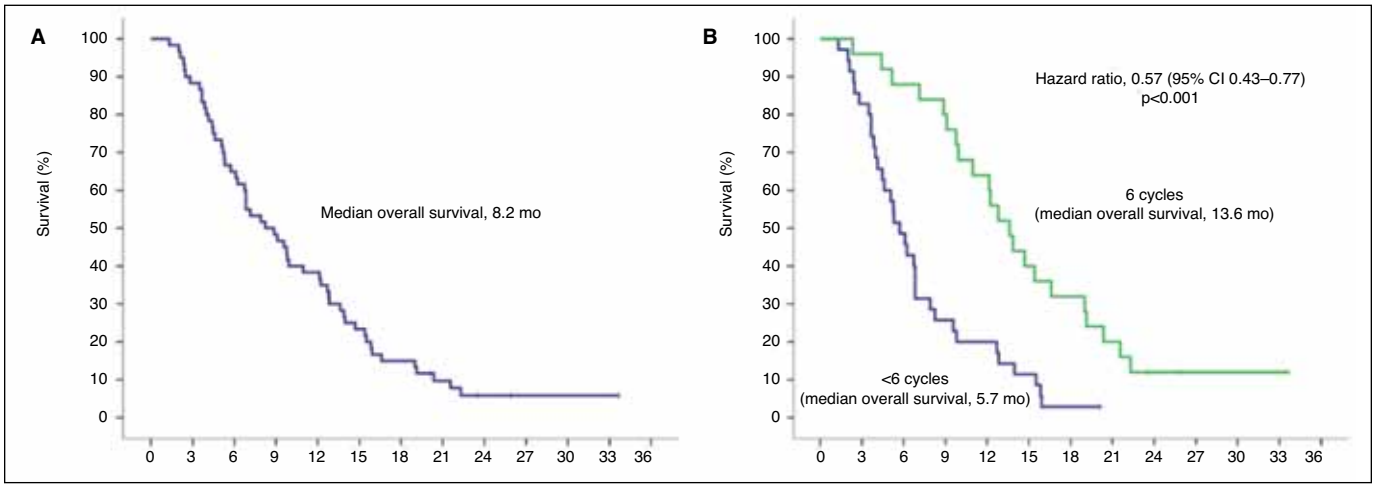
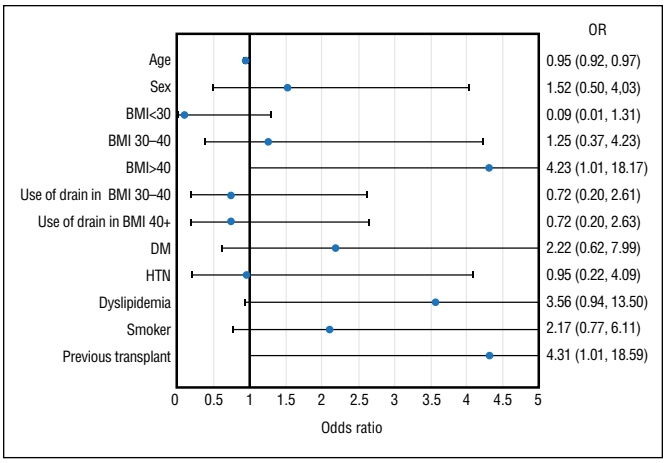
Introduction: Postoperative wound complications in the kidney transplant population are common and include infection, hematoma, lymphocele, dehiscence, and hernia. These complications are especially prevalent in patients with elevated body mass index (BMI) and contribute to longer hospital stays, higher readmission rates, and return trips to the emergency department. Any intervention that may reduce the risk of wound complications is worth exploring and some surgeons at our center have started using extrafascial, low-suction (Jackson-Pratt) drains in patients with elevated BMI as a prophylactic strategy. We set out to determine whether the placement of these drains at the time of kidney transplantation is protective against wound related complications in the postoperative period.

Methods: A retrospective chart review of all patients who underwent renal transplantation at The Ottawa Hospital between January 1, 2016 and January 20, 2018 was conducted. Patient demographics, type and severity of complications, and drain use were recorded. Simple and multivariate regression analysis was performed to determine the relationship between drain use and wound infections.

Results: A total of 208 patients were included in the study, with 47% (n=97) being obese (BMI 30–40) or morbidly obese (BMI >40). Drains were used in 54 individuals (26%), 38 (70%) of whom were obese or morbidly obese. With simple logistic regression, patients with a BMI from 30–40 and 40+ had a significant decrease in wound infection with the use of a JP drain (OR 0.29; 95% CI 0.13–0.64 and OR 0.11; 95%



MP6-12. Fig. 1.



MP6-13. Fig. 1.

CI 0.04–0.29, respectively). With multivariate analysis, only previous transplant was an independent predictor of wound infections (OR 4.314; 95% CI 1.01–18.59).

Conclusions: Wound infections are lowered in obese patients with drains; however, the role of drains in this finding remains uncertain. A prospective, randomized, controlled study is warranted to further investigate this relationship.