RPE-01

Diagnostic Dilemmas: A Multi-Institutional Retrospective Analysis of Adrenal Incidentaloma Pathology Based on Radiologic Size

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Introduction and Objective: Adrenal incidentalomas (AIs) are masses >1 cm found incidentally during radiographic imaging. They are present in up to 4.4% of patients undergoing CT scan, and incidence is increasing with usage and sensitivity of cross-sectional imaging. Most result in diagnosis of adrenal cortical adenoma, questioning guidelines recommending removal of all AIs with negative functional workup. This retrospective study analyzes histological outcome based on size of non-functional adrenal masses.

Methods: 10 years of data was analyzed from two academic institutions. Exclusion criteria included patients with positive functional workups, those who underwent adrenalectomy during nephrectomy, <18 years, and incomplete records. AI radiologic and histologic size, histologic outcome, laterality, imaging modality, gender, and age were collected. T-test was used for comparison of continuous variables, and the two-sided Fisher's exact or chi-square test were used to determine differences for categorical variables. Univariate analysis of each independent variable was performed using simple logistic regression.

Results: 73 adrenalectomies met the above inclusion criteria. 60 were detected on CT scan, 12 on MRI, and one on ultrasound. Eight of 73 cases resulted in malignant pathology, 3 of which were adrenocortical carcinoma (ACC). Each ACC measured >6 cm, with mean radiologic and pathologic sizes of 11.2 cm and 11.3 cm. Both radiologic and pathologic size were significant predictors of malignancy (p = 0.008 and 0.011).

Conclusions: Our results question the generally-accepted 4 cm cutoff for excision of metabolically-silent AIs. They suggest a 6 cm threshold would suffice to avoid removal of benign lesions while maintaining sensitivity for ACC.

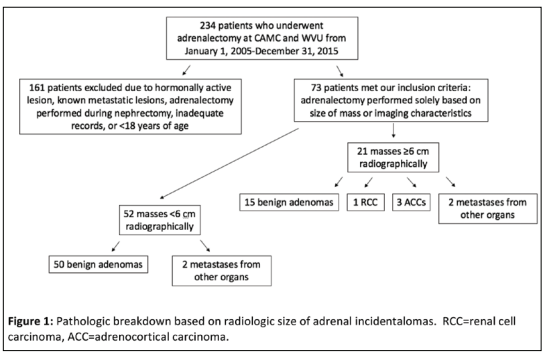

Figure 1: Pathologic breakdown based on radiologic size of adrenal incidentalomas. RCC=renal cell carcinoma, ACC=adrenocortical carcinoma.

Table 1: Demographics and Pathology Based on Radiologic and Pathologic Size

		<6	≥ 6	p-value
Radiological Size (cm)	Male	20 (38.46)	8 (38.10)	0.976
	Female	32 (61.54)	13 (61.90)	
	Age (years)	59.09 ± 11.81	56.33 ± 11.98	0.390
Pathologic Status Based on Radiologic Size	Adrenocortical carcinoma	0	3 (14.29)	0.008*
	Kidney cancer	0	1 (4.76)	
	Benign adenoma	50 (96.15)	15 (71.43)	
	Metastatic from other organ	2 (3.85)	2 (9.52)	
Pathological Size (cm)	Male	18 (38.30)	10 (38.46)	0.989
	Female	29 (61.70)	16 (61.54)	
	Age (years)	58.95 ± 12.01	56.96 ± 11.66	0.494
Pathologic Status Based on Pathologic Size	Adrenocortical carcinoma	0	3 (11.54)	0.011*
	Kidney cancer	0	1 (3.85)	
	Benign adenoma	46 (97.87)	19 (73.08)	
	Metastatic from other organ	1 (2.13)	3 (11.54)	

RPE-02

Risk of Secondary Malignancies After Pelvic Radiation: A Population-Based Analysis

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Introduction and Objective: Radiation therapy (RT) is an integral component of the multimodal therapy of pelvic malignancies, either as primary treatment or in combination with surgical resection. In addition to local treatment effects on nearby pelvic organs, RT has been established to be a risk factor for delayed secondary malignancies. In this study, we examine the rate of secondary malignancies following RT for primary pelvic malignancies.

Methods: Using the SEER (Surveillance, Epidemiology, and Ends Results) database, we retrospectively examined 2,102,192 patients with primary pelvic malignancies (prostate, bladder, uterine, rectal, cervical). For each disease site, we compared the rate of all secondary malignancies in radiated patients to non- radiated patients. Secondary malignancies were then stratified as pelvic and non-pelvic, in order to determine the effect of RT.

Results: A total of 2,102,192 patients were examined with a total of 113,322 patients developed secondary malignancies after RT (Table 1). After RT, 26,299 patients developed secondary pelvic malignancies (18,411 prostate, 1,026 bladder, 1,410 cervical, 2,179 uterine, 3,273 rectal) (Table 2). The overall relative risk (RR) of RT on developing a secondary malignancy was 1.79 (1.77-1.80 CI, P<0.0001), particularly in patients with prostate (RR 2.57), uterine (RR 1.24) and cervical cancer (1.09). The overall RR of RT on developing a secondary pelvic malignancy was 2.09 (2.06-2.13 CI, P<0.0001), particularly in patients with bladder (RR 6.90), prostate (RR 2.74), and uterine cancer (RR 1.21).

Conclusions: Radiation treatment for pelvic malignancies increases the risk of developing secondary malignancies over the patient's lifetime. Further work is needed to identify at risk populations.

PRIMARY MALIGNANCY TYPE	TOTAL NUMBER OF PATIENTS	Rate of Secondary Malignancy amongst RT patients Rate (%)	Rate of Secondary Malignancy amongst non-RT patients Rate (%)	RR	CI	P-value
ALL	2102192	113322/619186 (18.3)	151826/1483006 (10.2)	1.79	1.77-1.80	< 0.0001
BLADDER	315026	2444/18068 (13.5)	42317/296958 (14.3)	0.95	0.92-0.99	0.0071
CERVICAL	88809	3935/ 45747 (8.6)	3405/43062 (7.9)	1.09	1.04-1.14	< 0.0002
PROSTATE	1189108	90155/386147 (23.3)	73028/802961 (9.1)	2.57	2.54-2.60	< 0.0001
RECTAL/ANAL	259714	9739/98383 (9.9)	18743/161331 (11.6)	0.85	0.84-0.87	< 0.0001
UTERINE	249535	7049/70841 (9.9)	14333/178694 (8.0)	1.24	1.21-1.27	< 0.0001

Table 1: Rate of secondary malignancies after radiation

PRIMARY MALIGNANCY TYPE	TOTAL NUMBER OF PATIENTS	Rate of Secondary Pelvic Malignancy amongst RT patients Rate (%)	Rate of Secondary Pelvic Malignancy amongst non-RT patients Rate (%)	RR	CI	P-value
ALL	2102192	26299/619186 (4.2)	30076/1483006 (2.0)	2.09	2.06-2.13	< 0.0001
BLADDER	315026	1026/18068 (5.7)	2444/296958 (0.8)	6.9	6.42-7.41	< 0.0001
CERVICAL	88809	1410/45747 (3.1)	1551/43062 (3.6)	0.86	0.80-0.92	< 0.0001
PROSTATE	1189108	18411/386147 (4.8)	13970/802961 (1.7)	2.74	2.68-2.80	< 0.0001
RECTAL/ANAL	259714	3273/98383 (3.3)	7573/161331 (4.7)	0.71	0.68-0.74	< 0.0001
UTERINE	249535	2179/70841 (3.1)	4538/178694 (2.5)	1.21	1.15-1.27	0.27

Table 2: Rate of secondary pelvic malignancies after radiation

RPE-03

Don't Skirt the Question: Lead Bed Skirts in the OR, an Intervention

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Introduction and Objective: Fluoroscopy is an important tool in endourology and is often used throughout urologic training. Extrapolated data collected from our OR using real time dosimeters showed that despite using low dose technology, leaded aprons, and thyroid shields, the standard dose a resident receives over one year is 11% over the annual radiation dose limit to the eyes and near the annual dose limit for the entire body. The aim of our study is to reduce radiation exposure to the primary surgeon and anesthesia by installing a lead skirt around the operating table.

Methods: We placed a lead skirt around the operating table and used Radex One Quarta Geiger dosimeters at the level of the eyes, buttocks, anesthesia outer chest pocket, and adjacent to the x-ray tube to collect radiation exposure levels during procedures. We compared these data with data collected using the same configuration without a lead operating table skirt.

Results: Radiation exposure to various body parts during eighty-one endourologic procedures over a six-month period was tabulated. The highest amount of radiation received was to the eyes and buttocks. Installing a leaded skirt around the table attenuated the radiation scatter to all areas. Most notably, radiation to the eyes and buttocks was reduced by nearly 500% and 200%, respectively. This reflects a potential intervention that is simple and revolutionary in fluoroscopy.

Conclusions: Residents and anesthesia personnel are exposed to high amounts of radiation during fluoroscopic procedures. A lead skirt around the operating table significantly reduces radiation scatter in the operating room. This represents an inexpensive and innovative improvement to operating room safety and can be used across multiple specialties.

	Without Skirt (μgy)	With Skirt (μgy)
Glasses	8.42	1.46
Buttocks	1.53	0.7
Anesthesia lead chest	---	1.35
X-ray tube	13.41	5.68

Table 1. Radiation to various parts of the body. Dosimeters were placed during various endourologic procedures and the average values recorded from each body part listed.

RPE-05

The Impact of Covid-19 on Urologic Surgery Residency and Wellbeing in the US and EU

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Introduction and Objective: To assess changes to the experiences and wellbeing of urology trainees in the United States (US) and European Union (EU) during the COVID-19 pandemic.

Methods: A 72-item anonymous online survey was distributed September 2020 to urology residents of Italy, France, Portugal, and the United States. The survey assessed burnout, professional fulfillment, loneliness, depression and anxiety using validated questionnaires, as well as 38 COVID-19 specific questions and demographics. Two sample t-tests, chi-square tests, and paired t-tests were used to compare results.

Results: Two hundred twenty-three urology residents responded to the survey with an overall response rate of 16.5%. Surgical exposure was the largest educational concern for 81% of US and 48% of EU residents. E-learning was utilized by 100% of US and 57% of EU residents with two-thirds finding it equally or more useful than traditional didactics. With regards to well-being: 73% of US and 71% of EU residents reported good to excellent quality of life during the pandemic. No significant differences were seen comparing burnout, professional fulfillment, depression, anxiety, or loneliness among US or EU residents. Burnout was endorsed in 53% of residents. In the US and EU, significantly less time was spent in the hospital, clinic, and operating room ($p < 0.001$) and residents spent more time using telehealth and working from home during the pandemic. Residents spent more time on research projects, didactic lectures, non-medical hobbies, and non-medical reading during the pandemic. The majority of residents reported benefit from more schedule flexibility, improved work life balance, and increased time for family, hobbies, education, and research.

Conclusions: The COVID-19 pandemic has resulted in significant restructuring of residents' educational experience around the globe. Preservation of beneficial changes such as reduction of work hours and online learning should be pursued within this pandemic and beyond it.

RPE-04

Harnessing Choice Architecture in Urologic Practice: Implementation of an Opioid-Sparing Protocol Grounded in Cognitive Behavioral Theory

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Introduction and Objective: As many urologic procedures are performed minimally invasively, an opportunity exists to push forward initiatives to minimize postoperative opioid use. Here we report an effort to change entrenched clinical practice based on modern behavioral economics principles.

Methods: A quality improvement initiative to reduce inpatient opioid prescribing was launched at a tertiary cancer referral center. In phase I (December 2019-July 2020), providers were instructed to start patients on standing acetaminophen. In Phase II (beginning August 2020), education was provided to the entire care team and order sets were modified to reflect an opioid sparing protocol (OSP). We analyzed the proportion of minimally invasive surgery (MIS) prostatectomy and nephrectomy patients that adhered to an OSP during each phase and compared them to controls from the preceding 2 years.

Results: 303, 153, and 839 patients underwent MIS during the phase I, phase II, and control periods respectively. The proportion of patients adhering to an OSP increased from 16% at the beginning of phase I to 76% at the end of phase II (p-trend<0.001). The median total oral morphine equivalents (OME) for oral opioids declined from 20 mg and 40 mg during the control period for prostatectomy and nephrectomy patients respectively to 0 mg for both groups (p-trends<0.001). Multivariable logistic regression adjusting for history of anxiety or depression, surgery type, age and gender, found that patients received 22% and 81% less OME during phase I and II respectively (p<0.001; p<0.001).

Conclusions: Adherence to an OSP is most effective when initiatives incorporate the entire care team and are supported by nudge therapy-based structural changes. Using these strategies, most patients following urologic MIS can dramatically reduce or eliminate opioid use postoperatively.

Table 1: Post-operative Opioid Utilization following MIS Prostatectomy and Nephrectomy

		Prostatectomy					Nephrectomy				
		Baseline	Phase I	Phase II	p-trend	p-value	Baseline	Phase I	Phase II	p-trend	p-value
N		524	183	83			315	120	70		
Required Oral Narcotics	Yes	425 (81.1%)	99 (54.1%)	11 (13.3%)	<0.001	<0.001	278 (88.3%)	96 (80.0%)	26 (37.1%)	<0.001	<0.001
	No	99 (18.9%)	84 (45.9%)	72 (86.7%)			37 (11.7%)	24 (20.0%)	44 (62.9%)		
Total Oral Opioid (OME)		20 (10, 30)	7.5 (0, 30)	0 (0, 0)	<0.001	<0.001	40 (20, 67.5)	37.5 (15, 67.5)	0 (0, 10)	<0.001	<0.001
Total Oral Opioid of Patients requiring Oral Opioids (OME)		20 (15, 35)	22.5 (15, 37.5)	10 (7.5, 30)	0.6	0.05	45 (20, 70)	45 (24.5, 78.5)	23.8 (7.5, 35.0)	0.01	<0.001
Total Parenteral Opioid (OME)		1.34 (0, 2.68)	0 (0, 2.68)	0 (0,0)	<0.001	<0.001	1.34 (0, 2.68)	0 (0, 2.68)	0 (0, 0)	<0.001	<0.001
Total Parenteral Opioid after POD 0 (OME)		0 (0, 1.34)	0 (0, 0)	0 (0, 0)	<0.001	<0.001	2.68 (1.34, 6.7)	2.68 (1.34,5.4)	0 (0,0)	<0.001	<0.001
Oral Narcotics Ordered	Yes	521 (99.4%)	179 (97.8%)	22 (26.5%)	<0.001	<0.001	314 (99.7%)	118 (98.3%)	32 (45.7%)	<0.001	<0.001
	No	3 (0.6%)	4 (2.2%)	61 (73.5%)			1 (0.3%)	2 (1.7%)	38 (54.3%)		
Acetaminophen-Opioid Combination Ordered	Yes	423 (80.7%)	10 (5.5%)	0 (0.0%)	<0.001	<0.001	271 (86.0%)	11 (9.2%)	0 (0.0%)	<0.001	<0.001
	No	101 (19.3%)	173 (94.5%)	83 (100.0%)			44 (14.0%)	109 (90.8%)	70 (100.0%)		

RPE-06

Surgical Preparation in the Next Generation: YouTube Domination?
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Introduction and Objective: Urology trainees now have an array of digital materials and videos to use in conjunction with standard print sources for educational preparation for surgery. We investigate: 1) the degree to which urology trainees use video sources; 2) the types of source used; and 3) how these are combined with traditional print materials.

Methods: An IRB approved 13 question RedCap survey was distributed to 145 American College of Graduate Medical Education accredited Urology residency programs via email to the program coordinator who distributed the survey to their respective urology resident. Social media was used to recruit participants. Results were collected anonymously and analyzed.

Results: 108 urologic residents completed the survey. The most common print sources include Hinman's Atlas of Urologic Surgery (90%), Campbell-Walsh-Wein Urology (75%), and the AUA Core Curriculum (70%). The majority (90%) reported using a video source for surgical preparation. The most common video sources reported include YouTube (93%), the AUA Core Curriculum Videos (84%), and institutional or attending specific videos (46%). The criteria by which residents selected videos were video quality (81%), length of video (58%), and institution from which the video was published (37%). Video preparation was reported mostly commonly for minimally invasive surgery (95%), subspecialty procedures (81%) and open procedures (75%). When asked to rank their top three sources (print and video), 25% of residents reported YouTube as their top source, and 58% included it in their top three. Interestingly, while 77% of residents reported that they were aware the AUA Core Curriculum contains a video section, only 24% of residents were aware of the AUA YouTube channel.

Conclusions: The majority of urologic residents use video resources to prepare for surgeries with a heavy reliance on YouTube. AUA curated video sources should be highlighted in the resident curriculum as the quality and educational content of YouTube videos can vary.

MP1-01

Comparative Outcomes of Salvage Retzius-sparing Versus Standard Robotic Prostatectomy: an International, Multi-surgeon Series
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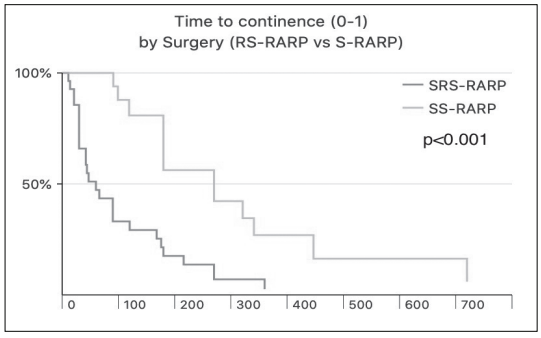
Introduction and Objective: Recurrence following non-surgical prostate cancer treatment is common, however salvage prostatectomy (SRP) is rare due to perceived risks. We compared outcomes of salvage Retzius-sparing robotic- assisted radical prostatectomy (SRS-RARP) with salvage standard robotic-assisted radical prostatectomy (SS-RARP).

Methods: We identified 40 SRS-RARP vs. 32 SS-RARP across 9 centers internationally. Cox proportional hazards model and Kaplan-Meier curves investigated factors associated with risk of incontinence and time to continence. Logistic regression models were constructed to assess factors associated with postoperative pad use and robotic console time.

Results: Median follow-up was 23 vs. 36 months for SRS-RARP vs. SS-RARP. Median console time (130 vs. 175 minutes, p=0.014) and EBL (100 vs. 150 mL, p=0.039) favored SRS-RARP. There were no differences in complication rates (12.5% vs. 28.1%, p=0.096), PSM (57.5% vs. 65.6%, p=0.482), BCR (23.1% vs. 37.5%, p=0.185), or postoperative ADT (12.8% vs. 15.6%, p=0.735). SRS-RARP had improved continence vs. SS-RARP (78.4% vs. 43.8%, p<0.001 for 0-1 pad, 54.1% vs. 6.3%, p<0.001 for 0 pad), lower mean pads per day (0.57 vs. 2.03, p<0.001), and earlier median return to continence (47 vs. 180 days, p=0.008). SRS-RARP was associated with less risk of incontinence (HR 0.36, 0.15-0.89, p<0.028) and decreased pad per day usage (PE -1.73, standard error 0.42, p<0.001). Lymph node dissection (PE 50.6, standard error 14.6, p<0.001) and primary treatment with SBRT (PE 86.9, standard error 37.2, p=0.032) were associated with longer console time.

Conclusions: SRS-RARP is a feasible salvage option with significantly improved urinary function outcomes. This may warrant a paradigm shift to increased utilization of SRS-RARP to manage the large number of men who will fail non-surgical primary treatment for prostate cancer.



MP1-02

Does Deferred Prostatectomy for Grade Group 1 and 2 Increase Risk of Adverse Pathology?

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Introduction and Objective: To compare the pathological outcomes among patients with grade group (GG) 1 and GG2 prostate cancer initially managed with active surveillance (AS) who later underwent radical prostatectomy (RP) versus risk-matched patients who underwent immediate RP.

Methods: Our prospectively maintained institutional database was queried for patients who enrolled in active surveillance from 2007-2020 with GG1 and GG2. All patients received combined MRI-targeted and systematic biopsies at the time of AS enrollment and surveillance biopsies. Patients who discontinued AS and underwent RP after AS were then compared to NCCN risk-matched patients who underwent immediate prostatectomy at our institution. Logistic regression analysis identified potential predictors of adverse pathology upon radical prostatectomy.

Results: 486 patients were enrolled in AS, and 83 patients underwent RP after discontinuing AS. Of these, 27 (32.5%) patients were on AS with GG2 disease and 56 (67.9%) patients were on AS with GG1 disease. Median time to prostatectomy among AS patients was 39 months (IQR: 28-64). There was no difference in rates of any adverse pathology among these patients versus risk-matched patients who underwent immediate prostatectomy (median 4 months (IQR: 3-5) from diagnosis) (42/83 (51%) vs. 192/387 (50%); p = 0.9) (Figure 1). On multivariable regression analyses, pre-operative PSAD (OR: 1.20 [CI: 1.04-1.42]; p<0.001) and having intermediate unfavorable (OR: 3.42 [1.18-12.5]: p =0.036]), high and very high risk disease at final biopsy (OR: 16.8 [5.71-62.3]: p<0.001) were independent predictors of adverse pathology (C-statistic = 0.81). Time to RP did not predict adverse pathology.

Conclusions: In well-studied AS patients with MRI and combined biopsy, at a median of 39 months of surveillance, patients with GG1 and GG2 disease are not disadvantaged by enrolling in AS.

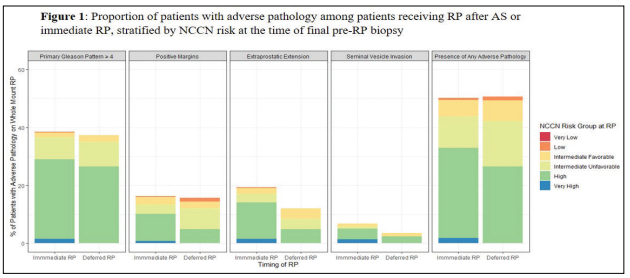

Figure 1: Proportion of patients with adverse pathology among patients receiving RP after AS or immediate RP, stratified by NCCN risk at the time of final pre-RP biopsy

MP1-03

Factors Associated with Use of Active Surveillance in NCCN Favorable Intermediate-Risk Prostate Cancer Patients Who Received a 17-gene Genomic Prostate Score Result

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Introduction and Objective: This observational study retrospectively evaluated the association between use of active surveillance (AS) and relevant covariates in patients with NCCN favorable intermediate-risk (FIR) prostate cancer (PCa) who received the 17-gene Genomic Prostate Score® (GPSTM) molecular assay.

Methods: Data were collected from patient charts at 7 urology practices in the United States. Eligible patients had localized PCa classified as FIR per NCCN guidelines and received a GPS report between May 2017 and April 2019. Higher GPS results (scale: 0-100) are associated with higher risk of adverse outcomes. The proportions of patients selecting active surveillance was calculated with 95% confidence intervals (CI). Uni- and multivariable logistic regression analyses were performed to determine the association between AS selection and relevant covariates.

Results: 324 eligible patients had 3 to 48 biopsy cores (median 12); 79% had grade group 2 tumors, 19% had PSA 10-20 ng/mL, and 2% were clinical stage T2b. GPS results for 76 patients were <20, 195 were 20-40, and 53 were >40. Overall, 31% (95% CI 26%, 36%) selected AS, with percentages decreasing as GPS results increased. In univariable models, Gleason Score, percent positive cores, PSA, and GPS result were significantly associated with AS selection. In a multivariable model including these variables, percent positive cores and the GPS result remained significantly associated with AS selection (Table 1).

Conclusions: Percent positive cores and the GPS result appear associated with AS use after controlling for relevant clinical variables in NCCN FIR PCa patients.

Table 1. Univariable and multivariable logistic regression models evaluating the association between AS selection (vs immediate treatment) and relevant covariates (N = 324).

Model	Variable	OR	95% CI	p-value
Univariable models				
1	GPS result (vs 20–40)			
	0–19	3.78	2.18 to 6.64	<.001
	41–100	0.17	0.04 to 0.47	0.003
2	Gleason Score 3+4 (vs 3+3)	0.38	0.22 to 0.66	<.001
3	PSA 10–20 ng/mL (vs < 10)	2.41	1.36 to 4.26	0.002
4	>16.7% positive cores (vs ≤16.7%)	0.49	0.30 to 0.80	0.005
5	Age at diagnosis (vs 65–74)			
	< 55	0.48	0.11 to 1.52	0.260
	55–64	1.55	0.91 to 2.64	0.108
	≥ 75	1.67	0.81 to 3.40	0.157
6	Clinical stage T2 (vs T1)	0.67	0.28 to 1.48	0.350
7	Ethnicity / Race (vs White)			
	Hispanic or Latino	1.71	0.88 to 3.26	0.106
	Black or African American	1.02	0.47 to 2.11	0.950
	Asian / NHOPI / Unknown	0.68	0.28 to 1.52	0.375
8	PSA density ≥ 0.15 ng/cm^3 (vs < 0.15)[a]	0.98	0.61 to 1.59	0.946
Multivariable model				
	GPS result (vs 20–40)			
	0–19	3.39	1.91 to 6.08	<.001
	41–100	0.18	0.04 to 0.53	0.006
	>16.7% positive cores (vs ≤16.7%)	0.56	0.32 to 0.95	0.032
	Gleason Score 3+4 (vs 3+3)	0.56	0.10 to 2.82	0.475
	PSA 10–20 ng/mL (vs < 10)	0.77	0.13 to 4.08	0.756

[a] N = 310

MP1-04

A Review of SpaceOAR Complications and Influential Patient Characteristics

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Introduction and Objective: Approved by the FDA in 2015, SpaceOAR injections are a recent advancement to minimize rectal toxicity for prostate cancer treatment with radiotherapy. There is a paucity of literature examining complications of the procedure. We reviewed our experience of SpaceOAR placement for occurrence of complications and examined patient characteristics related to outcomes.

Methods: We conducted a retrospective review of 233 patients who underwent SpaceOAR placement at our academic hospital by four surgeons and one radiation oncologist between 2018-2021. Variables such as demographics, oncologic parameters, radiation plan, and radiographic assessment of hydrogel placement were recorded. The Charlson Comorbidity Index (CCI) was used to assess comorbidity risk.

Results: Of the 233 patients who received SpaceOAR, 25 (10.7%) experienced toxicity. All complications were mild (Grades 1-2) and transient. 7 patients experienced pelvic pain post placement, 5 experienced hematuria, 1 experienced rectal bleeding, 1 experienced urinary retention requiring straight catheterization, 8 experienced lower urinary tract symptoms, 1 experienced mild stress urinary incontinence, 1 experienced pelvic fullness, 2 experienced hemorrhoids, 4 experienced a change in bowel frequency, and 1 experienced a TIA a few hours after placement. For patients who experienced complications, the average CCI was 3.16; in the group without complications, the average CCI was 3.56 (p=NS). The patients without complications did have a higher BMI on average compared to those with (28.9 vs. 26.78, respectively (p=0.039145)). A total of 16 patients (6.9%) had some portion of the hydrogel injected into the rectal wall, which was never clinically significant.

Conclusions: SpaceOAR placement is well tolerated with a low incidence of toxicity or related complications. Toxicity was mild (Grades 1-2) and transient in the majority of patients. Injection of hydrogel into the rectal wall was infrequent and was not clinically significant. Overall, the procedure is well tolerated with low rates of procedure-related toxicity.

MP1-05

Do 5-alpha Reductase Inhibitors Effect the Diagnostic Accuracy of MRI-Fusion Biopsies?

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Introduction and Objective: Use of 5-alpha reductase inhibitors (5-ARIs) in prevention of prostate cancer has been examined from many angles. We aimed to test the hypothesis that reduced prostate size by the use of 5-ARIs may increase the diagnostic rate of MRI-fusion prostate biopsies.

Methods: Retrospective review of one institution identified 215 consecutive MRI-fusion biopsies, 25 of which, were noted to be taking a 5-ARI at time of biopsy. Chi squared and Fischer tests were used to assess the significance of differences between biopsy results of each set of patients.

Results: 52% of the patients on 5-ARIs had positive MRI-fusion biopsies (77% clinically significantly positive, defined as greater than grade group 1, and 23% insignificant), and 48% were negative. Of patients not taking 5-ARIs, 64% had cancer (41% significantly positive and 59% insignificant) and 36% were negative. There was no difference in rates of cancer detection in any core based on whether a patient was taking a 5-ARI, chi square 1.4, p=.23. There was also no difference in cancer detection in MRI regions of interest (ROI) alone in those taking a 5-ARI and those who were not, Chi square .33, p=.23. There was a significant difference in detection of significant cancers vs. insignificant in patients taking 5-ARIs, Fisher exact test value of .0179, $p<.05$; when comparing patients with significant vs. insignificant cancer found in the ROI, the Fisher exact test value was .131 <.05.

Conclusions: Although 5-ARIs do not impact accuracy of MRI-fusion biopsies in our small study, more significant cancers were found in patients on 5-ARIs when considering all cores. It may be that with a larger patient population, further differences would be borne out. We continue to collect data to further explore this as it may influence the use of these medications around diagnostic testing in the future.

MP1-06

Comparing MRI/US Fusion to Standard Prostate Biopsy in Determining Grade Reclassification at Confirmatory Biopsy in a Multi-Institutional Active Surveillance Cohort: A Pennsylvania Urology Regional Collaborative (PURC) Analysis

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Introduction and Objective: Active surveillance (AS) has emerged as the optimal management of low-risk prostate cancer (CaP) patients, relying on an accurate confirmatory biopsy to stratify disease risk. Conflicting literature exists regarding whether multiparametric (mp) MRI/fusion biopsy improves detection of clinically significant cancers compared to standard 12-core trans rectal ultrasound (TRUS) at time of confirmatory AS biopsy. We aimed to analyze a prospectively maintained multi-institutional AS database to compare clinically significant reclassification rates between biopsy groups at confirmatory biopsy.

Methods: The Pennsylvania Urological Regional Collaborative (PURC) database, a prospectively maintained consortium CaP database, was retrospectively queried for all low-risk CaP men on AS. Patients were categorized by modality of confirmatory biopsy (either standard 12 core TRUS prostate biopsy or mpMRI targeted/ultrasound fusion prostate biopsy). The primary outcome of interest was grade group reclassification at the time of confirmatory biopsy.

Results: The study cohort included 469 low risk men on AS, with 339 (72%) undergoing standard 12-core TRUS confirmatory biopsy and 130 (28%) undergoing fusion confirmatory biopsy. There were no differences between groups at index biopsy, regarding demographic or disease characteristics. (Table 1) Clinically significant grade reclassification, defined as GG2 or greater, was seen on 42% (54) of mpMRI biopsies vs. only 22% (74) of standard biopsies ($p < 0.001$). (Table 2)

Conclusions: The use of mp-MRI for AS confirmatory biopsy, compared to standard 12-core TRUS biopsy, improved the detection of clinically significant cancer. These findings suggest the value of MRI/US fusion biopsy to appropriately identify higher risk men on AS who may benefit from definitive treatment.

Table 1: Patient and Disease Information at Index Biopsy

Confirmatory Biopsy Group	Standard Biopsy (n=339)	mpMRI Biopsy (n=130)	P-Value
Age (#, %)			0.81
50-59	52 (15)	22 (17)	
60-69	181 (53)	71 (55)	
70-79	106 (31)	37 (28)	
Race (#, %)			0.51
African American	71 (21)	31 (24)	
Asian	11 (3)	2 (2)	
Caucasian	246 (73)	95 (73)	
Other	11 (3)	2 (2)	
Family History (#, %)			0.06
1st Degree Relative	70 (21)	31 (24)	
2nd Degree Relative	18 (5)	8 (6)	
None	213 (63)	88 (68)	
Unknown	28 (8)	2 (2)	
History of MI (#, %)	9 (3)	3 (2)	0.83
History of CVD (#, %)	4 (1)	4 (3)	0.16
History of COPD (#, %)	12 (4)	6 (5)	0.59
Index PSA (Median, IQR)	5.0 (4.3-6.2)	5.2 (4.1-6.6)	0.57
Total Cores (Median, IQR)	12 (12-12)	12 (12-12)	0.19
Positive Cores (Median, IQR)	1 (1-3)	2 (1-3)	0.10
Greatest % Involvement of Core (Median, IQR)	10 (5-20.5)	11.5 (5-30)	0.13
Perineural Invasion (#, %)	12 (4)	8 (6)	0.54
Gland Volume (cc, Median, IQR)	42 (33-55)	40 (32-54)	0.55
Interval Time Between Biopsies (yr, Median, IQR)	1.0 (0.6 – 1.10)	0.80 (0.6-1.10)	0.47
Biopsy Results (#, %)			< 0.001
GG1 → Benign	112 (33)	21 (16)	
GG1 → GG1	153 (45)	55 (42)	
GG1 → GG2	49 (14)	35 (27)	
GG1 → GG3	18 (5)	11 (8)	
GG1 → GG4	6 (2)	6 (5)	
GG1 → GG5	1 (0)	2 (2)	
Clinically Significant Upstage (#, %)			< 0.001
GG1 → Benign or GG1	265 (78)	76 (58)	
GG1 → GG2 or Greater	74 (22)	54 (42)	

Table 2: Biopsy Outcomes at Time of Confirmatory Biopsy

Confirmatory Biopsy Group	Standard Biopsy (n=339)	mpMRI Biopsy (n=130)	P-Value
Interval Time Between Biopsies (yr, Median, IQR)	1.0 (0.6 – 1.10)	0.80 (0.6-1.10)	0.47
Biopsy Results (#, %)			< 0.001
GG1 → Benign	112 (33)	21 (16)	
GG1 → GG1	153 (45)	55 (42)	
GG1 → GG2	49 (14)	35 (27)	
GG1 → GG3	18 (5)	11 (8)	
GG1 → GG4	6 (2)	6 (5)	
GG1 → GG5	1 (0)	2 (2)	
Clinically Significant Upstage (#, %)			< 0.001
GG1 → Benign or GG1	265 (78)	76 (58)	
GG1 → GG2 or Greater	74 (22)	54 (42)	

MP1-07

PSA Density is Complementary to Prostate MRI PI-RADS Scoring System for Stratifying Clinically Significant Prostatic Malignancies

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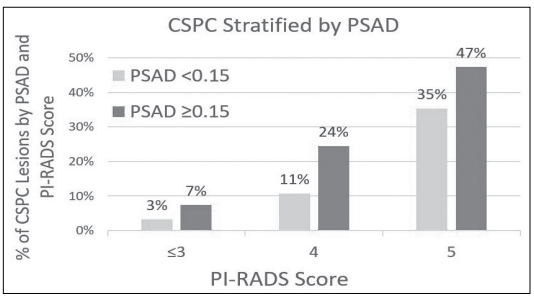
Introduction and Objective: While PSA has traditionally been used for prostate cancer(PCa) risk stratification, prostate MRI has more recently allowed improved diagnosis of clinically significant PCa(CSPC). However, it is not well described if these two tests are complementary to each other. The objective of this study was to determine if prostate MRI and PSA can provide complementary insights into PCa risk-stratification.

Methods: Biopsy results were reviewed from 327 patients who underwent MR/US fusion targeted prostate biopsy. Each biopsy sample from the lesions was given a Gleason grade (GG) and pathologic outcomes were stratified by various parameters, including PI-RADS v2 score. CSPC was defined as Gleason score ≥7. Logistic regression was used to determine OR with 95%CI.

Results: A total of 709 lesions were analyzed. We found PSA density (PSAD) and PIRADS-score provided complementary predictive value for diagnosis of CSPC (AUC PSAD: 0.67, PIRADS: 0.72, combined: 0.78, p<0.001). When using a PSAD cut-off of ≥0.15 ng/ml/cc, 24% of all PIRADS-4 and 47% of all PIRADS-5 lesions were found to have CSPC, compared to 11% of PIRADS-4 and 35% of PIRADS-5 lesions with PSAD<0.15 (figure 1). When controlling for PIRADS-score, age, and race, multivariate analysis showed that PSAD was independently associated with CSPC using the cutoff of ≥0.15 ng/ml/cc (OR 2.24, 95%CI 1.41-3.54, p<0.001). This finding was also supported when performing multivariate analysis controlling for PIRADs, age and race using PSAD as a continuous variable (OR 1.03 per 0.01 PSAD increase, 95% CI 1.02-105, p<0.001).

Conclusions: PSAD appears to be a useful marker that can stratify the risk of CSPC in a complementary manner to prostate MRI. Further studies are warranted to help determine optimal PSAD cut-offs by PI-RADS scores to optimize CSPC predictions.



MP1-08

Sagacity of Same Day Discharge: Incidence and Timing of Postoperative Adverse Events Following Minimally Invasive Urologic Surgery

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Introduction and Objective: Among efforts to judiciously utilize resources and contain cost, is a push to reduce postoperative length of stay, resulting in several groups promoting same day discharge (SDDC) for patients undergoing minimally invasive prostatectomy (MIP) and minimally invasive partial nephrectomy (MIpN). We aimed to 1) describe the incidence and timing of adverse events and 2) compare the incidence of these outcomes for patients undergoing SDDC and non-SDDC following MIP and MIpN.

Methods: We review the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database for patients undergoing MIP and MIpN from 2015 to 2019. The primary outcomes were to describe the incidence of adverse events, readmission, reoperation, and death and the timing of these outcomes after surgery. We compared the incidence of outcomes of interest between patients undergoing same day discharge (SDDC) vs. non-SDDC using the chi-squared test.

Results: A total of 64,975 patients underwent MIP (46,869) and MIpN (18,106), of which 650 (1%) had a SDDC. We noted 4,593 complications in 3,560 (5.5%) patients. Compared with non-SDDC patients, SDDC patients had similar incidence of any complication (5.2% vs. 5.4%, p=0.830), reoperation (0.9% vs. 1.3%, p=0.372), readmission (3.5% vs. 4.4%, p=0.268), or death (0.16% vs. 0.13%, p=0.836). With regards to timing of adverse events, 984/1057 (93%) blood transfusions, 59/129 (46%) myocardial infarctions, 40/86 (47%) cardiac arrests, 91/397 (23%) reoperations, 219/2857 (8%) readmissions, and 14/87 (16%) deaths occurred within 2 days of the index surgery.

Conclusions: The perioperative period for patients undergoing MIP and MIpN remains a critical period in which serious adverse events do occur. Same day discharge may be a viable option for select patients, but a period of observation to ensure patients safety should remain the standard of care for most individuals undergoing MIP and MIpN.

MP1-09

Financial Toxicity of Prostate Cancer Survivorship: a National Cross-Sectional Assessment of Indirect Financial Burden

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Introduction and Objective: Financial toxicity as a consequence of cancer has only recently been assessed in prostate cancer (PCa). No current studies evaluate indirect costs of PCa survivorship. We aim to describe patient-reported indirect financial burden within a cross-sectional cohort of PCa survivors across the United States.

Methods: Using Medical Expenditure Panel Survey (MEPS) data from the Agency for Healthcare Research and Quality (AHRQ), we identified 264 PCa survivors who completed the Cancer Self Administered Questionnaire (CSAQ) in 2016 and 2017. We assessed the presence and specific themes of indirect financial burden, an affirmative response to questions endorsing burden in employment, work ability, and insurance as a consequence of the subject's cancer.

Results: Overall, 31.4% (n=83) men endorsed ≥1 measure indicating some degree of indirect financial burden. The 5 most common were extended time off from work, changes to work schedule, extended paid time off, interference with physical tasks, and less productivity at work since PCa diagnosis (Figure 1). Younger age (p<0.05), health insurance type (p<0.05), and caregiver presence (p<0.05) were noted in men with indirect financial burden (Table 1). Upon logistic regression, age (OR 0.98, 95%CI 0.96-0.99, p<0.05) and caregiver presence (OR 2.29, 95%CI 1.71-5.00, p<0.05) remained significant.

Conclusions: In this novel analysis, nearly 1/3 of men report some degree of indirect financial burden. We identify several commonly endorsed domains, including physical and mental disturbances at work and extended leave from work. In understanding the intricacies of cancer financial toxicity, it is important to consider indirect sequelae of diagnoses and treatments to provide patient-centered care.

Table 1. Prostate Cancer Survivors by Indirect Financial Burden

		No Indirect Financial Burden	Indirect Financial Burden	Total	p-value
		N=181	N=83		
Age		76 (68-82)	69 (63-74)		<0.001
Race	Hispanic	17 (68%)	8 (32%)	25	0.91
	Non-Hispanic White	123 (70%)	53 (30%)	176	
	Non-Hispanic Black	34 (65%)	18 (35%)	52	
	Non-Hispanic Asian	3 (75%)	1 (25%)	4	
	Non-Hispanic Multiple Race/Ethnicity	4 (57%)	3 (43%)	7	
Education	<= High School	77 (70.0%)	33 (30.0%)	110	0.69
	>= Some college	104 (67.5%)	50 (32.5%)	154	
Marital Status	Not Married	77 (75.5%)	25 (24.5%)	102	0.058
	Married	104 (64.2%)	58 (35.8%)	162	
No. of Comorbidities	0	11 (73.3%)	4 (26.7%)	15	0.37
	1	22 (56.4%)	17 (43.6%)	39	
	2	34 (69.4%)	15 (30.6%)	49	
	3+	114 (70.8%)	47 (29.2%)	161	
Additional Cancer	No	167 (69.3%)	74 (30.7%)	241	0.48
	Yes	14 (60.9%)	9 (39.1%)	23	
Last Cancer Treatment	Less than 1 year ago	14 (67%)	7 (33%)	21	0.85
	1 to 3 years ago	12 (57%)	9 (43%)	21	
	3 to 5 years ago	12 (60%)	8 (40%)	20	
	5 to 10 years ago	40 (73%)	15 (27%)	55	
	10 to 20 years ago	35 (70%)	15 (30%)	50	
	More than 20 years ago	8 (62%)	5 (38%)	13	
	No treatment for cancer to date	13 (68%)	6 (32%)	19	
	Not answered	47 (72%)	18 (28%)	65	
Currently Treated for Cancer	No	148 (68.2%)	69 (31.8%)	217	1.00
	Yes	30 (69.8%)	13 (30.2%)	43	
	Not Answered	3 (75.0%)	1 (25.0%)	4	
Cancer Recurrence	No	123 (67.6%)	59 (32.4%)	182	0.31
	Yes	7 (53.8%)	6 (46.2%)	13	
	No Answer	22 (76%)	7 (24%)	29	
Health Insurance	Medicare Only	46 (81%)	11 (19%)	57	<0.001
	Medicaid Only	8 (80%)	2 (20%)	10	
	Private Only	44 (49%)	45 (51%)	89	
	Medicaid + supplement	1 (50%)	1 (50%)	2	
	Medicare + supplement	34 (87%)	5 (13%)	39	
	Other	21 (66%)	11 (34%)	32	
	No insurance	5 (83%)	1 (17%)	6	
	No Answer	22 (76%)	7 (24%)	29	
				0	
Family income quartile, $	Q1(Less than 22k)	49 (74%)	17 (26%)	66	0.25
	Q2(22k to 51k)	43 (66%)	22 (34%)	65	
	Q3(51k to 92k)	48 (74%)	17 (26%)	65	
	Q4(Greater than 92k)	41 (60%)	27 (40%)	68	
Census Region	Not Answered	5 (100.0%)	0 (0.0%)	5	0.40
	Northeast	34 (64.2%)	19 (35.8%)	53	
	Midwest	41 (69.5%)	18 (30.5%)	59	
	South	72 (72.0%)	28 (28.0%)	100	
	West	29 (61.7%)	18 (38.3%)	47	
Caregiver	No	127 (77.5%)	37 (22.5%)	164	<0.001
	Yes	54 (54%)	46 (46%)	100	

Data are presented as n (row %).
MEPS CSAQ Questions included: 9-11, 13-19, 30-31, 33-44, 47b, 47c

MP1-10

Large Scale Implementation of Opioid Prescription Reduction after Robotic Prostatectomy – 2 year Evaluation from the Pennsylvania Urologic Regional Collaborative (PURC)

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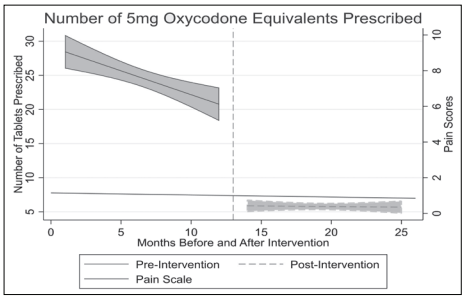
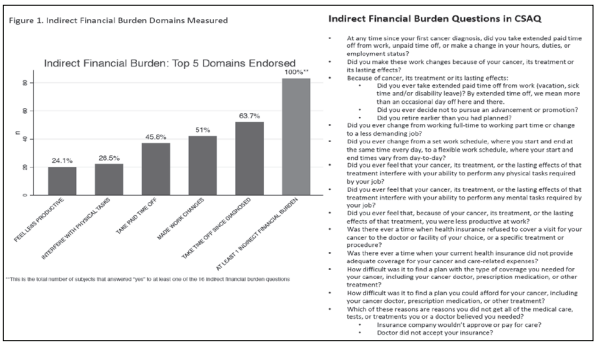
Introduction and Objective: Diversion of post-operative medication is a major contributor to opioid misuse. It is necessary for urologists to help combat the opioid epidemic while still providing effective pain management. The objective of this study is to evaluate the impact of implementing an opioid reduction protocol for robotic prostatectomy (RALP) within a regional collaborative where opioid abuse is endemic.

Methods: An opioid reduction protocol was implemented for patients undergoing RALP at three institutions within the Pennsylvania Urologic Regional Collaborative (PURC). We compared prescribing practices 12 months before and after the intervention, with a one-month washout period. We measured opioid prescriptions on discharge and patient reported pain levels at their first post-operative visit. All opioid prescriptions were converted into equivalents of oxycodone 5mg tablets. Pain scores were captured with a visual analog scale of 0-10.

Results: Overall, 1,518 patients underwent RALP, with a median age of 63.6 years (IQR 58.4-68.0). For the 12 months before implementation, a median of 20 oxycodone 5mg tablets were prescribed on discharge (IQR 14-30) and after this decreased to a median of 0 tablets (IQR 0-14, p<0.001). Despite the decrease in opioid prescriptions, there were no significant changes in pain scores (median value 0/10, p=0.78, Fig. 1). Overall, 14 less opioid tablets were prescribed per RALP, leading to a total of 10,248 less opioid tablets in Pennsylvania over a 1-year period.

Conclusions: Adequate pain control is feasible without opiates for the majority of patients undergoing RALP, allowing for significant reductions in the number of opioids entering the community. Urologists have an important role in reducing opioid oversupply. Policies to encourage opioid stewardship should be designed to encourage adoption of such programmatic change.





MP1-11

Analyzing Recent Medicare Reimbursement Trends in Urology

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Introduction and Objective: Understanding changes in insurance reimbursement rates is key to analyzing the sustainability of urologic practice. Unfortunately, there is a marked paucity of investigation into physician insurance remuneration trends over the last decade. Only one study has looked at recent urology insurance reimbursement rates, but the investigation was significantly limited as it only analyzed twenty current procedural terminology (CPT) codes. This study aimed to evaluate the changes in insurance reimbursement and consider possible sequelae in urology clinical practice.

Methods: A multi-institution review of The Physician/Supplier Procedure Summary database for all procedures billed by urologists to Medicare Part B from 2010 to 2019 was conducted. CPT codes and reimbursement for more than 66 million approved procedures consisting of 606 unique codes were collected. CPT codes were categorized based on code ranges as defined by the American Medical Association. All monetary values were adjusted for inflation using 2019 US dollars.

Results: From 2010 to 2019, average reimbursement declined by 17.9%. Among the largest decreases were in urodynamic procedures (-49.9%), endoscopycystoscopy/urethroscopy/cystourethroscopy (-27.0%), female genital procedures (-25.8%) and urethral procedures (-20.0%). Among the least affected were prostate (+0.7%) and kidney procedures (-7.5%).

Conclusions: In this constantly changing healthcare environment, Medicare reimbursement for urologic procedures has shown an overall downward trend. As Medicare policies can affect both private and public insurance policies, decreasing reimbursement in urology may have widespread impacts. Physicians should be aware of the changing landscape and the various ways it may affect their clinical practice.

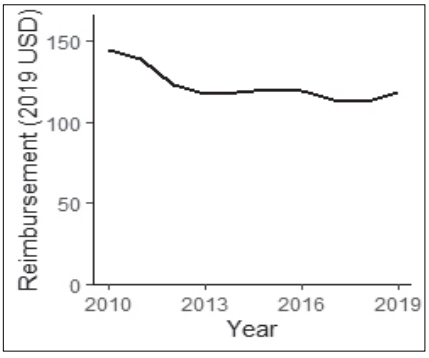
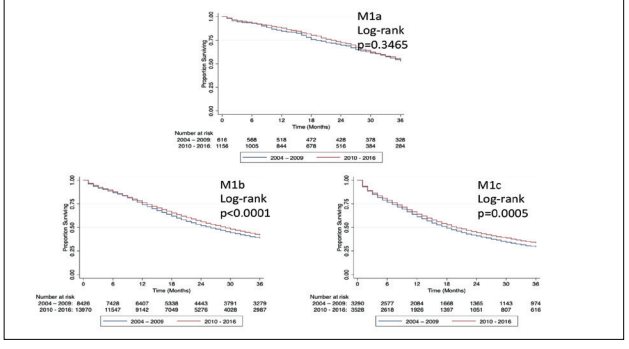


Figure 1. 3-year PCSS of patients with M1a, M1b, and M1c prostate cancer in 2004-2009 and 2010-2016. M1a PCSS did not change from 2004-2009 to 2010-2016, while M1b and M1c PCSS improved from 2004-2009 to 2010-2016.



MP1-12

Racial and Stage Disparities in Increased Survival Among Patients with Metastatic Prostate Cancer in the Second-Line Antiandrogen Therapy Era

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Introduction and Objective: Since 2004, several drugs have been approved for metastatic prostate cancer including the chemotherapeutic agent docetaxel, immunotherapies, and second-line antiandrogen therapies (SATs). Given the recent advent of several SATs for metastatic prostate cancer since 2010, we hypothesized that there would be significant improvements in survival among patients with metastatic prostate cancer from the pre-docetaxel to SAT era (years 2000 to 2016).

Methods: Using the SEER database, we assessed the survival outcome of metastatic prostate cancer patients based on three time periods: 2000-2003 (era 1), 2004-2009 (era 2), and 2010- 2016 (era 3). Prostate cancer-specific survival (PCSS) was estimated using the Kaplan-Meier product limit method stratified by three time periods. Age, treatment, and race/ethnicity were reported in a multivariable Cox proportional hazards model.

Results: Among 41,149 patients at least 18-years-old diagnosed with distant prostate cancer between 2000 and 2016, there was a statistically significant improvement in prostate cancer-specific survival of 4 months among patients diagnosed from 2010-2016 when compared to those in the pre-2010 period. Interestingly, this survival benefit was limited to patients with bone and visceral metastases (M1b and M1c stage). Additional factors associated with improved PCSS were Hispanic ethnicity, Asian race, and receipt of local treatment.

Conclusions: Collectively, our observation suggests that despite the new treatment agents such as second-line antiandrogen therapies introduced in the modern era, the improvement in survival of metastatic prostate cancer patients has been surprisingly small and observed more in patients with M1b and M1c stages as well as Hispanic and Asian patients.

Table 1. Cox proportional hazards analysis of factors associated with prostate cancer cause-specific survival

	Sample size (%)	HR (95% CI)	p-value	Adjusted HR (95% CI)	p-value
Sample Size	40,691				
Era					
1 (2000 – 2003)	7,947 (19.53%)	1 (Referent)		1 (Referent)	
2 (2004 – 2009)	12,874 (31.64%)	0.982 (0.948 – 1.017)	0.307	1.004 (0.969 – 1.040)	0.817
3 (2010 – 2016)	19,870 (48.83%)	0.869 (0.840 – 0.900)	< 0.001	0.909 (0.878 – 0.941)	< 0.001
Age					
<55	2,786 (6.85%)	1 (Referent)			
55-70	15,979 (39.27%)	0.988 (0.932 – 1.048)	0.690	0.996 (0.939 – 1.056)	0.888
>70	21,926 (53.88%)	1.640 (1.550 – 1.735)	< 0.001	1.618 (1.528 – 1.713)	< 0.001
Race/Ethnicity					
Non-Hispanic White	26,072 (64.07%)	1 (Referent)		1 (Referent)	
Non-Hispanic Black	7,491 (18.41%)	0.980 (0.947 – 1.014)	0.245	1.065 (1.029 – 1.103)	< 0.001
Hispanic	4,446 (10.93%)	0.884 (0.845 – 0.924)	< 0.001	0.933 (0.892 – 0.976)	0.003
Non-Hispanic Asian/PI	2,266 (5.57%)	0.748 (0.701 – 0.797)	< 0.001	0.736 (0.691 – 0.785)	< 0.001
Non-Hispanic American Indian/Alaska Native	251 (0.62%)	1.019 (0.864 – 1.202)	0.824	1.053 (0.892 – 1.242)	0.544
Non-Hispanic Unknown Race	165 (0.41%)	0.255 (0.173 – 0.375)	< 0.001	0.270 (0.183 – 0.397)	< 0.001
Treatment					
No local therapy	39,749 (97.68%)	1 (Referent)		1 (Referent)	
Prostatectomy and/or Radiotherapy	942 (2.32%)	0.324 (0.284 – 0.370)	< 0.001	0.375 (0.328 – 0.429)	< 0.001

MP1-13

Gleason Upgrading Between Targeted and Systematic Template Biopsy for mpMRI PIRADS 5 Lesions

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Introduction and Objective: Multiparametric MRI/transrectal ultrasound fusion biopsy has improved detection of clinically significant prostate cancer and involves targeted biopsy of suspicious regions of interest (ROI) along with systematic template biopsy. Given the high incidence of cancer detection for PIRADS-5 lesions, a targeted-only biopsy paradigm may afford sufficient detection of index pathology while minimizing morbidity. We analyze rates of upgrading between template and targeted samples in PIRADS-5 lesions to determine the clinical utility of template sampling.

Methods: Upon retrospective examination of institutional data, we identified n=62 patients with PIRADS-5 lesions who underwent fusion biopsy with both targeted and extended sextant template-directed cores. Gleason group (GG) >1 pathology was analyzed for rates of upgrading (i.e. GG ≥2) between ROI-targeted and template-directed pathology. PIRADS-5 was defined as ≥1.5cm hypo-/hyperdense lesion or definitive extraprostatic extension.

Results: Clinically significant cancer (GG ≥2) was found in 89% of patients with a PIRADS 5 score, with 5% revealing benign pathology and 6% clinically insignificant (GG=1). Average ROI cores taken in the cohort was 3.1. Targeted biopsy yielded dominant cancer pathology in 80% of the cohort with an upgrading of 20% upon additional template biopsy. Geographical partitioning analysis showed index pathology from systematic biopsy came from the same or adjacent ROI sextant in these upgraded cases. Only two (3.3%) ROI pathologies were upgraded from clinically insignificant to significant after template biopsy, with ROI and template sextant identical in these cases.

Conclusions: A high rate of clinically significant prostate cancer was diagnosed relying only on ROI-directed biopsy of PIRADS-5. The addition of systematic, template biopsy detected an additional 3.3% of clinically significant cancers, both GG=2. In all cases of upgrading, template biopsy came from adjacent or identical sextants, suggesting a near miss in ROI-targeting. ROI-directed biopsy may be sufficient for PIRADS-5 patients, with future studies examining increased sampling at the ROI site to ensure index capture.

MP1-14

Qualitative Evaluation of Differing Opioid Sparing Protocols Across the Pennsylvania Regional Collaborative: Understanding Barriers and Facilitators

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Introduction and Objective: Pennsylvania has the 3rd highest rate of opioid-related mortality across the US. Many studies have evaluated opioid sparing protocols (OSP), however, the heterogeneity of these protocols has yet to be compared. To that end, we provide a qualitative comparison of OSP across an endemic region.

Methods: Within the Pennsylvania Urologic Regional Collaborative (PURC), OSP had been implemented for robotic prostatectomies (RALP) at four different institutions within PURC. To better understand the variability across QI protocols a survey was conducted to capture information on the baseline protocol, the details of the interventions, the primary outcome of interest at the institution.

Results: Across the four institutions there was wide variability in the methods employed to decrease patient exposure to opioids. All interventions targeted inpatient utilization of opioids through the addition of standing ketorolac and acetaminophen. All programs only prescribed opioids if they were required as an inpatient. Environmental changes to influence prescribing behavior were found to be essential, including provider "nudges" in the form of order set modifications, especially to remove default prescription settings. All institutions reported need to engage key stakeholders including Advanced Care Providers and Housestaff to improve compliance with OSP. However, there are concerns of returns to baseline prescribing practices over time, with one institution reporting a relative increase of 20% in opioid prescriptions during year 3 after the OSP implementation.

Conclusions: OSP are feasible to implement on a large scale across multiple academic practices. Utilizing multi-faceted approach to implementation, including key stakeholders, and reducing friction in complying with OSP were key to decreasing opioid use. Long-term studies on implementation strategies are needed to understand how potential gains can be maintained to improve patient care.

Program (year of intervention)	Base state				Intervention				Non-medical interventions	
	Standing medication	Pain Scale	Escalation	Discharge	Standing medication	Pain Scale	Escalation	Discharge	Order-set changes Attending, Housestaff and Nursing education	Primary outcome---%change
FCCC -2020	---	1 tab percocet 2 tab percocet Dilaudid 0.2 mg	Toradol Lidocaine patch Dilaudid PCA	10 tabs all patients	Ketorolac Acetaminophen	---	Tramadol Oxycodone Dilaudid	10 tabs only if opioids required as inpatient	Order-set changes Attending, Housestaff and Nursing education	Adherence to OSP 359% increase
PENN (2018)		1 tab percocet 2 tab percocet Morphine 2mg Dilaudid 0.2mg	Toradol Lidocaine patch Dilaudid PCA	28-45 tabs all patients	Ketorolac Acetaminophen Gabapentin Bupivicaine		Tramadol Oxycodone Morphine	Acetaminophen Neurontin Tramadol or Oxycodone 10 tablets only if required as inpatient	Order set changes Erasing default settings Educational sessions with PA / NP and Residents	Percent discharged with opioids decreased from 99% to 53.6%.
Jefferson (2019)		1 tab percocet 2 tab percocet Morphine 2mg Dilaudid 0.2mg	Toradol Lidocaine patch Dilaudid PCA	20-30 tabs all patients	Ketorolac Acetaminophen Pregabalin Bupivicaine		Oxycodone	Acetaminophen Motrin Oxycodone 10 tablets only if required as inpatient	Order-set changes Attending, Housestaff and Nursing education	Percent discharged with opioid who had ZERO use as inpatient decreased from 97% to 30.4%
Penn State (2019)		1 tab percocet 2 tab percocet Morphine 2mg Dilaudid 0.2mg	Toradol Lidocaine patch Dilaudid PCA	20-30 tabs all patients	Ketorolac Acetaminophen Gabapentin		Tramadol Oxycodone	Acetaminophen Neurontin Tramadol or Oxycodone 10 tablets only if required as inpatient	Order-set changes Attending, Housestaff and Nursing education	Percent discharged with opioid who had ZERO use as inpatient decreased from 100% to 4.6%

MP1-15

Existing Urine Exosome Gene Expression Signature to Assess Upgrade Risk on Radical Prostatectomy (RP).

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Introduction and Objective: Active surveillance (AS) is used to treat men with low-risk prostate cancer but sampling error, tumor heterogeneity/multi-focality complicate AS decision-making. The ExoDx Prostate (EPI) Test is a pre-biopsy urine biomarker for high-grade prostate cancer (HGPCa). Herein, we correlate EPI Test scores with RP pathologic upgrading and potential identification of men less suitable for AS.

Methods: Patients with no history of PCa, >50 yrs, PSA 2-10 ng/mL and undergoing prostate biopsy (Bx) were included. The EPI Test was performed on first-catch, pre-Bx urine. This study focuses on men with Gleason Grade Group 1 (GG1) pathology on Bx who underwent RP instead of AS. The EPI scores were compared to a multi-parametric linear regression model using covariates PSA, age, ethnicity and family history for correlation with Gleason RP upgrading.

Results: 1563 patients in US and Europe (2014 to 2020) were studied. 295 men underwent RP including 106 (36%) with GG1 on biopsy. Between the Bx-GG1 (N=106) and the Bx >GG1 (N=189) cohorts, there were no significant differences in age (60 [57-65] vs. 64 [59 - 68] years; p=0.61), PSAs (median PSA 5.32 [4.3 - 6.47] vs. 5.48 [4.3-7.0] ng/mL; p=0.66), AA ethnicity (2.8% vs. 7.4%; p=0.89) or family history of PCa (32% vs. 25%; p=0.33). In the Bx-GG1 group, 45% (48) were confirmed GG1 on RP, whereas 55% (58) were upgraded – 41% (43) GG2, 11% (12) GG3, 1% (1) GG4, and 2% (2) GG5. The model showed no significant differences between the groups (p >0.1). EPI scores for patients who remained GG1 vs those upgraded to GG2 showed no significant difference (p=0.45), whereas they were significantly higher (p <0.01) in those upgraded to ≥GG3.

Conclusions: The EPI Test offers prognostic value for RP upgrading in men GG1 prostate cancer. A liquid biomarker test may more appropriately address tumor heterogeneity compared to post-biopsy tissue-based molecular tests.

MP2-01

Ambulatory Percutaneous Nephrolithotomy Performed in a Free-Standing Surgery Center: Outcomes of 1000 Cases

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Introduction and Objective: Percutaneous Nephrolithotomy (PNL) is a procedure that is traditionally performed in an inpatient setting. Many procedures have evolved from an inpatient setting to ambulatory surgery center (ASC). Feasibility of ambulatory PNL (aPNL) was shown in our initial pilot series of 25 cases. This 1000 case series is reviewed to further evaluate outcomes with a more robust data set

Methods: 1000 patients underwent aPNL from 2015 to 2021. Each was performed with the same operative team. All procedures were performed with urologist obtaining renal access and all were tubeless. Patients had hemostatic plugs placed into the access tract with a local intercostal block. Cases were reviewed and demographic data and case details were analyzed.

Results: 1000 consecutive aPNL cases were reviewed, identifying 488 men and 512 women, 460 right side and 535 left, mean age 57 years, mean BMI 30, mean ASA of 2.3 and mean stone burden 31 mm, mean fluoroscopy time 84 sec, mean OR time 95 min, mean treatment time 14.9 min and mean PACU time 91 min. A mini-PNL (mPNL) procedure was conducted in 255 (25.5%) patients. The remaining 745 were standard size of which 449 were 30Fr and 296 were 24Fr. Stone free rate was 83%. Thirty-nine patients had complications ranging from Clavien II-IVa, 15 were hospital transfers.

Conclusions: These 1000 cases may serve as a landmark series demonstrating the feasibility of aPNL. Transitioning PNL to an ambulatory setting is a paradigm shift in the treatment of complex kidney stones. Each complication that occurred was managed in an appropriate fashion and the site of service did not lead to an alteration in the outcomes of the adverse events. With an experienced surgeon, well trained operative team and with modifications to the procedure focusing on post-operative pain control, PNL can be safely and effectively performed in a free standing ASC.

MP2-02

Automated Machine Learning Segmentation and Measurement of Urinary Stones on CT Scan

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Introduction and Objective: Treatment decisions for patients with urinary stones depend on multiple factors including stone size, location, and renal anatomy. Manual human measurements introduce inconsistencies, are laborious, and time-consuming. Our objective was to evaluate the performance of a machine learning algorithm in measuring stone and anatomic features.

Methods: A sample of 95 CT scans from patients diagnosed with stones were included. Two raters manually measured stones in 3 orthogonal dimensions, renal pelvis width, and ureter diameter on 46 scans. A two-way random intraclass correlation (ICC) score was calculated to quantify intrarater agreement. The remaining 49 scans were used to train a deep learning model to segment stones. Times for manual and machine calculations were recorded.

Results: The sample included 19 scans with kidney stones, 17 with ureteral stones, and 10 with both. Median time in 3 dimensions was longer manually than with the algorithm (16.1 vs. 2.1 seconds). Intrarater reliability was poor for pelvis width (0.44, 95% CI 0.21 – 0.62) and ureter diameter (0.40, 95% CI 0.16 – 0.59), and good for stone size (0.79, 95% CI 0.75 – 0.83). The algorithm identified all stones present (100% sensitivity) with no false positive stones (100% specificity). At the individual voxel level, sensitivity of stone detection fell to 58%, while specificity remained at 100%, using manual measurements as ground truth. Although the algorithm reliably captured centers of stones, the total volume was smaller than identified by human raters.

Conclusions: Manual measurements of ureteral stones and anatomy on CT are limited by the time required and poor reproducibility. The more rapid and accurate measurements provided by the algorithm can transform clinical care by enhancing and standardizing assessment across patients, institutions, and providers.

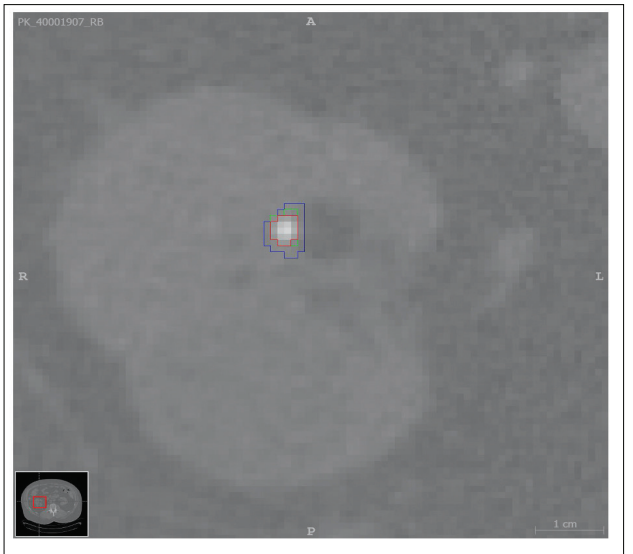

Figure 1. Comparison of kidney stone area captured by machine algorithm (red), human rater 1 (green) and human rater 2 (blue)

MP2-03

Use of Mini sipIT Behavioral Intervention to Increase Fluid Intake in Patients with Kidney Stones

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Introduction and Objective: Wearable technology is both increasingly prevalent and successfully improving a variety of health behaviors. We previously showed that digital health tools are capable of identifying a lapse in drinking behavior in real-time to promote fluid consumption. The purpose of this study was to determine the feasibility, acceptability and impact of a simplified intervention, specifically a context-sensitive reminder system that incorporates a connected water bottle, with kidney stone patients – a population that often has poor adherence to increasing fluid intake for prevention.

Methods: Patients with a history of kidney stones and urine volume less than 2 liters/day were recruited to participate in a 1-month feasibility trial. Patients were given an H20Pal connected water bottle and received hourly text message reminders when they were not meeting fluid intake goals. Perceptions of drinking behavior, intervention acceptability and 24-hour urine volumes were obtained at baseline and after the 1-month mini sipIT intervention.

Results: Analysis of data from the 13 of 19 participants who have completed the study to date (77% female, age = 48.5 ± 16.9 years), indicates that 24-hour urine volumes increased for 69% of participants (median 1640 mL, IQR 1300-2380 mL). Most participants perceived that mini sipIT helped them to increase their fluid intake (85%) and more participants perceived that their drinking behavior was automatic (baseline 23% vs. post-intervention 46%). However, six participants reported that carrying the water bottle was cumbersome.

Conclusions: The preliminary results indicate that mini sipIT intervention is feasible and provides automated lapse-detection that improves fluid intake. Although patients found the intervention acceptable, reports that carrying the water bottle was cumbersome suggest use of multimodal intake monitoring systems. Digital health tools in combination with behavioral science may help to improve adherence to fluid intake recommendations for kidney stone prevention.

MP2-04

Use of Novel Software for Predicting Outcomes Following Percutaneous Nephrolithotomy: A Pilot Study

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Introduction and Objective: Percutaneous nephrolithotomy (PCNL) is a surgical treatment option for large and complex intrarenal stones. Despite its high stone free rate, it also has a relatively high risk of complications. Quantitative Stone Analysis Software (qSAS) is a novel application that analyzes the three-dimensional characteristics of urinary stones in a semi-automatic fashion. It may serve as a tool to predict outcomes following PCNL. The purpose of this study is to determine if the enhanced characterization of stone burden, provided by the novel qSAS, correlates with potential complications following PCNL.

Methods: We performed a retrospective review of 50 patients with nephrolithiasis who underwent PCNL at a single institution. qSAS was used to analyze stone characteristics based on preoperative Computed Tomography (CT) imaging. Patient electronic medical records were surveyed for complications, including the need for further surgical intervention, occurring within 60 days postoperatively. Wilcoxon Rank Sum and Chi Square tests were applied to determine statistical significance.

Results: The mean number of stones per patient was 2.0 (IQR = 2.0), the mean diameter was 41.3 mm (IQR = 35.2 mm), and the mean stone volume was 3,086 mm3 (IQR = 2,919 mm^3). Patients who required second procedures had a higher number of stones, as calculated by qSAS (3.2 vs. 1.8, p = 0.022). Additionally, those with secondary procedures showed a trend towards greater diameter of the largest stone (34.8 mm vs. 67.2 mm; p = 0.071) and greater total stone volume (2,603.2 mm^3 vs. 5,017.2 mm^3; p = 0.083), which fell short of significance.

Conclusions: Greater number of stones, as detected by qSAS, is positively correlated with the need for additional procedures following PCNL. Further prospective studies should investigate the utility of qSAS for improved patient selection and surgical planning for nephrolithiasis.

MP2-05

Comparison of Management and Outcomes of Symptomatic Urolithiasis during the COVID-19 Pandemic to a Comparative Cohort

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Introduction and Objective: The lockdowns that ensued during the coronavirus disease 2019 (COVID-19) pandemic saw the reduction of emergency department (ED) visits for many medical conditions. It is unknown whether patients who presented with symptomatic urolithiasis during the initial months of the COVID-19 pandemic suffered greater morbidity.

Methods: We retrospectively reviewed ED presentations from a Philadelphia healthcare system for symptomatic urolithiasis between March-June 2020 and compared these with presentations for the same time period from the year prior. Patient demographics, stone characteristics, management and clinical outcomes were compared between the two years.

Results: 139 patients presented during 2020 compared to 269 in 2019. There were fewer patients who presented during the initial COVID-19 pandemic surge who had obesity (37.41% vs. 49.44%, p=0.024), hyperlipidemia (18.71% vs. 31.60, p=0.006), and asthma (5.76% vs. 16.73%, p=0.002). Although overall stone characteristics did not differ between the two groups, a larger proportion of patients in 2020 presented with an obstructing stone (81.16% versus 64.1%, p=0.001). Patients who presented during the COVID-19 pandemic did not have higher rates of infection, acute kidney injury, or complications. Rates of surgical modalities, emergent procedures, and discharges from the ED were similar between the two years.

Conclusions: The COVID-19 pandemic initial surge resulted in fewer ED presentations for symptomatic urolithiasis; however, patients who did present were more likely to have obstructing stones, perhaps due to delaying presentation to avoid COVID-19 exposure in the ED. Despite higher rates of obstruction, clinical outcomes and morbidity were similar.

	March-June 2019	March-June 2020	P-Value
First stone event	45.53% (117/257)	47.83% (66/138)	0.662
Previous passed stone	43.06% (93/216)	32.23% (39/121)	0.051
Previous stone surgery	28.99% (69/238)	22.96% (31/135)	0.159
Maximum stone size (mm)	6.04 ± 4.48	5.76 ± 2.57	0.501
Number of stones	2.97 ± 3.20	2.96 ± 2.67	0.969
Staghorn calculus	4.35% (11/253)	0.72% (1/138)	0.047
Obstructing stone	64.71% (165/255)	81.16% (112/138)	0.001
Imaging Modality			
None	3.71% (10/269)	2.16% (3/139)	
CT scan	88.10% (237/269)	93.53% (130/139)	
Ultrasound	7.43% (20/269)	4.32% (6/139)	
KUB	0.74% (2/269)	0.00% (0/139)	0.367

Table 1. Stone characteristics of patients presenting with symptomatic urolithiasis

	March-June 2019	March-June 2020	P-Value
White blood cell count	9.61 ± 3.27	10.27 ± 3.54	0.076
WBC in UA	20.41 ± 48.03	14.85 ± 36.48	0.284
Nitrite Positive UA	4.55% (12/264)	2.19% (3/137)	0.238
Leukocyte Esterase Positive UA	27.65% (73/264)	27.01% (37/137)	0.891
Bacteria Present UA	33.94% (75/221)	64.8% (57/88)	0.000
Positive Urine Culture	11.33% (29/256)	9.42% (13/138)	0.558
Temperature >38 C at presentation	1.40% (4/269)	1.44% (2/139)	0.970
Acute kidney injury	14.29% (33/231)	10.08% (13/129)	0.251
Urology Consult	27.88% (75/269)	34.53% (48/139)	0.165
Surgery			
None	85.50% (230/269)	84.06% (116/139)	
Stent	7.06% (19/269)	6.47% (9/139)	
PCN	1.86% (5/269)	2.16% (3/139)	
Ureteroscopy	5.58% (15/269)	7.91% (11/139)	0.812
Emergent Stent/PCN	1.86% (6/269)	0.72% (1/139)	0.365
Discharged from ED	82.53% (222/269)	78.42% (109/139)	0.315
Re-presented to ED within 30 days	13.38% (36/269)	14.39% (20/139)	0.758
Disposition after representation to ED			
Discharge	61.11% (22/36)	35.00% (7/20)	
Medical admit	5.56% (2/36)	10.00% (2/20)	
Procedure	33.33% (12/36)	55.00% (11/20)	0.172
Average days returned to ED	8.03 ± 7.01	6.9 ± 7.99	0.586
Complication rate	1.86% (5/269)	2.16% (3/139)	0.836

Table 2. Management and clinical outcomes of patients presenting with symptomatic urolithiasis

MP2-06

Post-Operative Pain and Recovery in Patients with Nephrolithiasis: Results from the Endourological Society TOWER Research Collaborative

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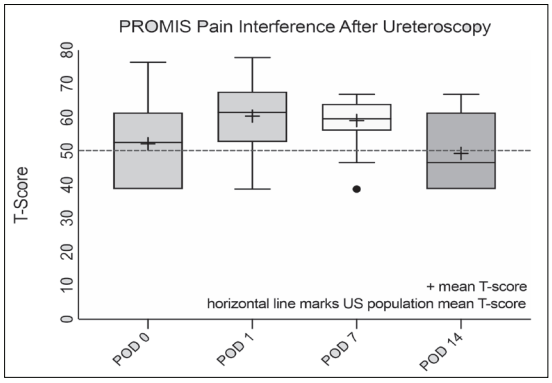
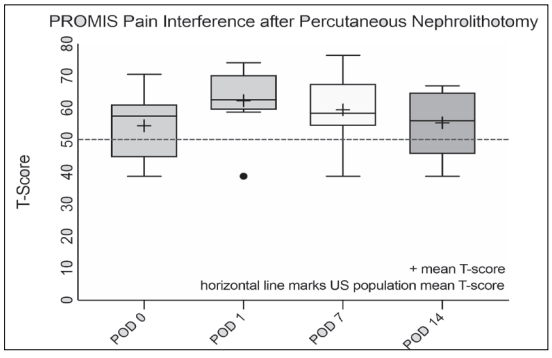
Introduction and Objective: Urolithiasis is among the most common urological conditions, however, the impact of pain on patients with the disease remains understudied, particularly following surgical intervention. We prospectively captured patient-reported pain interference in patients following ureteroscopy (URS) or percutaneous nephrolithotomy (PCNL) for nephrolithiasis.

Methods: Adults undergoing URS or PCNL for renal/ureteral stones were eligible for inclusion (10/2020-3/2021). Patients prospectively completed the PROMIS- Pain Interference instrument pre-operatively (POD 0) and via email on POD 1, 7, and 14. Scores are reported as T-scores (normalized to US pop., mean=50) with a change of 5 (0.5 SD) considered clinically significant.

Results: A total of 68 patients completed enrollment at POD 0 (POD 1=40, POD 7=39, POD 14=32). In the URS cohort, repeated measures ANOVA show statistically significant difference in pain interference scores between POD 0 and 1 and between POD 7 and 14 (Figure 1, $p < 0.05$). Similar findings were seen in the PCNL cohort (Figure 2, $p < 0.05$). Both URS and PCNL patients return to baseline pain interference by POD 14. No demographic or perioperative characteristics were predictive of greater interference.

Conclusions: Pain interference increases immediately post-operatively. Both URS and PCNL patients see a reduction below the baseline in pain interference by POD 14. Results offer meaningful insight to assist with patient counseling for surgical treatment of nephrolithiasis.





MP2-07

From Doctor Google to the App Store: Where Stone Patients Get Information

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Introduction and Objective: Patient-centered care is at the forefront of medical innovation. With the increasing production of nephrolithiasis related applications (apps), we sought to explore their use among the general population and evaluate the quality of information regarding stone prevention and treatment.

Methods: Using Google Trends, quantity and frequency of searches related to smartphone apps between 2016 and 2021 were studied. BuzzSumo, an online content research platform, was used to query the results. A voluntary questionnaire, which aimed to ascertain where patients obtain stone-related information, was posted on two popular Facebook sites and one Reddit group that stone formers frequent. Based on usage, seven smartphone apps were chosen for investigation. These apps were compared with respect to download and usage data provided by their developers. The DISCERN tool was utilized to assess the quality of clinical information available on these apps.

Results: Google Trends results revealed that the search volume index of "kidney stones app" has increased by about 60% and 80% in the US and worldwide respectively in the last year. Of the 115 questionnaire participants, 22.7% reported using a kidney stone app at least once. However, when asked where they obtained most of their information, respondents indicated their doctor (44%), YouTube (6.6%), smartphone apps (4.2%) and other sources (19%). Information important to respondents were diet and water intake (50%), procedures (24%), and medical treatment (24%). Mean DISCERN score for the seven apps evaluated was 2.07 with no statistically significant difference among evaluators.

Conclusions: While physicians are still the most used resource by nephrolithiasis patients, usage of online platforms and smartphone apps is increasing. Patients are especially interested in water intake and diet-based apps. The evaluation of these apps with DISCERN indicates that their content is potentially important but has shortcomings. Urologists' engagement with these platforms would ensure dissemination of high-quality information to patients.

MP2-08

Identifying and Evaluating Online Kidney Stone Pain Resources

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Introduction and Objective: This study aims to identify the most popular online kidney stone pain (KSP) topics and resources and evaluate the content's readability and quality.

Methods: The social media analysis platform Buzzsumo was utilized to identify KSP-related articles and videos and to determine their respective engagement levels (defined based on likes, comments, reactions, and views). The content that met a predetermined standard of greater than 50 engagements were compiled and organized into appropriate categories. The readability of the 10 most popular articles were evaluated using an online website (www.readabilityformulas.com) to determine reading grade level. The quality of the same articles were evaluated using the DISCERN instrument.

Results: Results from Buzzsumo were organized into four categories (from highest to lowest engagement): 'passing stones', 'home remedies', 'stent pain', and 'back pain'. The mean grade level of the articles was 10.4; the median was 10 (Figure 1). The articles analyzed by DISCERN yielded a mean score of 2.67/5 (Figure 2). Articles did well to describe the benefits of their advice (Q10 – 4.2/5) but often failed to discuss its risks (Q11 – 1.45/5).

Conclusions: This study has identified four topics of interest within online KSP resources: passing stones, home remedies, stent pain, and back pain. Popular articles related to these topics are written at a high school level exceeding the average reading grade level of the American population. These articles have potentially important content but have significant shortcomings. Future patient focused resources should aim to reduce complexity of language and provide impartial advice and information.

Figure 1: Histogram of reading grade level for the top 10 Buzzsumo articles

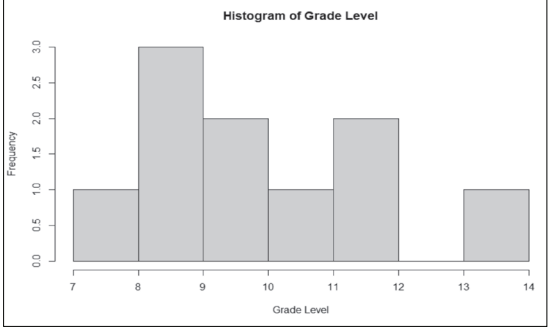
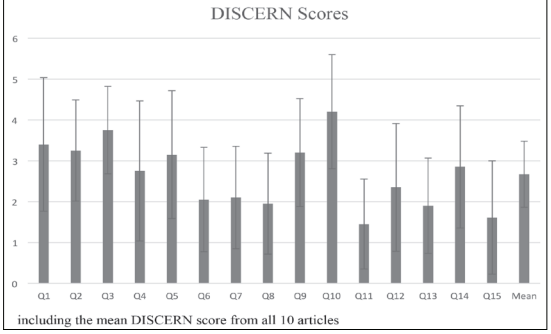


Figure 2: Aggregate DISCERN scores (out of 5) based on the top 10 Buzzsumo articles, including the mean DISCERN score from all 10 articles



MP2-09

Evaluation of Robotic versus Open Approaches for Unilateral Ureteral Reimplantation in Pediatric Patients.

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Introduction and Objective: We are aiming to evaluate if robotic ureteral reimplantation is a feasible and safe alternative to the conventional open approach in unilateral vesicoureteral reflux in pediatric population.

Methods: We retrospectively identified all pediatric patients who underwent robotic unilateral ureteral reimplantation (RUR), and a similar non-concurrnet cohort of patients who underwent open ureteral reimplantion (OUR) was also identified. A total of 33 patients met the inclusion criteria and were included in the analysis. Patients were divided into two groups: group 1 (robotic approach) and group 2 (open approach). Patients' demographics, perioperative data, and outcomes were collected and reviewed, and univariate analysis was conducted.

Results: Total of 17 patient underwent RUR and 16 patients underwent OUR. There was no difference between the two groups regarding demographic data, laterality, incidence of duplicated system or reflux grade. Group 1 had higher incidence of constipation (94.2% vs. 56%) and dysfunctional voiding (82% vs. 37%) (P = 0.01). Both groups were similar regarding operative time and detrusor tunnel length. All patients in both groups were discharged after 24-48 hours. No reported early postoperative complications. One patient in group 2 required readmission within 30 days for UTI. A total of 13 patients in group 1 underwent follow-up voiding cystourethrogram (VCUG) that showed success rate of 100% with new development of contralateral Grade 1 VUR in 2 patients. In group 2, only 2 patients underwent follow-up VCUG for febrile UTI and it showed newly developed contralateral VUR.

Conclusions: Our results suggest that robotic approach for ureteral reimplantation as a management for vesicoureteral reflux in pediatric population is a safe and feasible alternative to open approach. Future studies with larger number are warranted.

	Group 1 (Robotic approach)	Group 2 (Open Approach)	P value
Number	17	16	
Age years, *(median, range)*	5 (2-9)	5.5 (0.5-9)	0.44
Gender *(no., %)*			1
Female	14 (82.4%)	14 (87.5%)	
Male	3 (17.6%)	2 (12.5%)	
Laterality *(no., %)*			0.46
Left	10 (58.8%)	12 (75%)	
Right	7 (41.2%)	4 (25%)	
Duplex system *(no., %)*	4 (23.5%)	1 (6.3%)	0.33
Grade of reflux *(no., %)*			0.26
G1	0	0	
G2	3 (17.6%)	3 (18.8%)	
G3	9 (52.9%)	5 (31.3%)	
G4	5 (29.4%)	6 (37.5%)	
G5	0	2 (12.5%)	
Constipation *(no., %)*	16 (94.1%)	9 (56.3%)	0.01*
Dysfunctional voiding *(no., %)*	14 (82.4%)	6 (37.5%)	0.01*

Table 1: baseline demographic and clinical data

	Group 1 (Robotic approach)	Group 2 (Open Approach)	P value
Operative time (minutes) *(mean, SD)*	162 (28.7)	157 (32.6)	0.66
Length of the tunnel cm *(mean, SD)*	3.5 (0.6)	3.2 (0.4)	0.13
EBL (cc) *(median, range)*	2 (0-5)	5 (0-10)	0.002*
Postoperative complications	0	0	
Hospital-stay (days) *(median, range)*	1 (1-2)	1	0.33
Postoperative PVR (cc) *(median, range)*	1 (0-33)	14 (0-30)	0.12
30-dyas readmission *(no., %)*	0	1 (6.3%)	0.48

Table 2: operative and postoperative outcomes

MP2-10

Surgical Correction of True Diphallia in a Newborn Male
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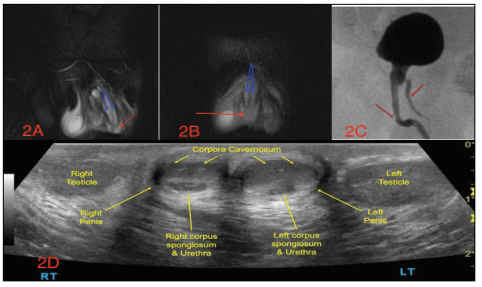
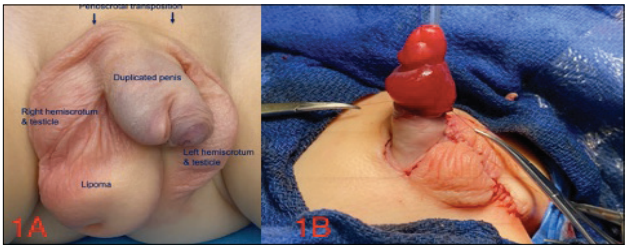
Introduction and Objective: Diphallia is an exceedingly rare congenital anomaly characterized by partial or complete duplication of the phallus, with causes yet to be fully discerned. Approximately 100 cases have been reported worldwide since its initial documentation in the 17th century. Our aim is to add to the existing literature on this rare disease with characterization of our case and subsequent surgical correction.

Methods: The patient was born at 36 weeks 5 days and presented to our clinic at ten days of age. Karyotyping revealed 46 XY with no additional chromosomal abnormalities. Physical exam revealed duplicated phallus with patent meatuses bilaterally, penoscrotal transposition and a large midline scrotal lipoma (Figure 1A). The patient underwent ultrasound imaging of the kidneys, bladder and genitalia, voiding cystourethrogram, and magnetic resonance imaging of the pelvis and genitalia pre-operatively (Figure 2A-2D).

Results: He underwent extensive surgical correction with left phallic amputation, excision of scrotal lipoma, and bilateral scrotal flap creation to give the appearance of a single, circumcised phallus with bilateral descended testicles within a solitary scrotum (figure 1B). Post-operative evaluation at 3 months revealed excellent cosmesis.

Conclusions: True complete diphallia is an especially rare and intimately disfiguring disease, however, with proper pre-operative planning and surgical technique, normal anatomic appearance may be attained.





MP2-12

Provider Compliance and Clinical Outcomes Over Two Years Following Implementation of a Pre-biopsy Rectal Swab Protocol
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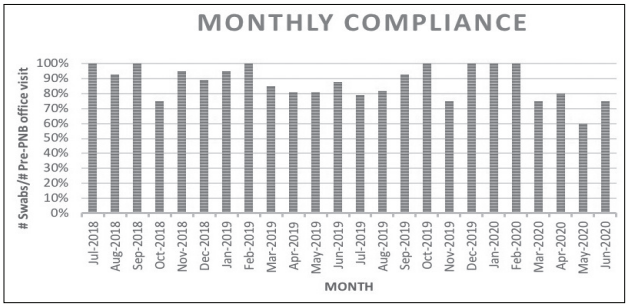
Introduction and Objective: Fluoroquinolone antibiotics are often used for infection prophylaxis prior to transrectal prostate needle biopsy (PNB). Fluoroquinolone-resistance of bacteria in the rectal vault may contribute to increasing rates of infection and hospitalization of patients. In 2018, we implemented pre-biopsy rectal swab testing for fluoroquinolone resistant (FQR) organisms in all patients undergoing transrectal PNB. Herein, we report on provider compliance and outcomes of this quality improvement intervention.

Methods: Records of transrectal PNB procedures performed after rectal swab protocol implementation over 24 months from July 2018 – June 2020 were reviewed. We assessed for institutional compliance with swab utilization, incidence of FQR, and rates of post-biopsy infection. Logistic regression FQR, and post-biopsy infection.

Results: Of 349 patients who underwent transrectal PNB, 309 (88.5%) had a FQR rectal swab performed. Algorithm compliance remained stable over the two year period (90% year 1; 87% year 2, p=0.50), despite decreased compliance observed in the four months following the COVID-19 pandemic (90% pre-COVID, 74% March-June 2020, p=0.01) (Figure). 34 patients had culture-proven quinolone resistance (11.0%). Antibiotic use within the previous 6 months (OR 5.23, p = 0.028) was associated with a positive swab, while healthcare worker status was associated with a negative swab (OR 0.19, p = 0.028). Seven of 349 (1.9%) of patients experienced post-PNB urinary tract infection or urosepsis. Infectious complications were associated with hospital admission in the previous six months (OR 19.67, p = 0.015).

Conclusions: A protocol to perform rectal swab for evaluation of bacterial fluoroquinolone resistance prior to PNB was implemented over two years with approximately 90% compliance. In consideration of 11.0% resistance prevalence, this feasible, low-risk intervention is sustainable and can help improve antibiotic stewardship for patients undergoing PNB.



MP2-11

Implementation of a Pre-operative Testing Algorithm During the Initial COVID-19 Wave at a Rural Tertiary Care Center
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Introduction and Objective: Infection with SARS-COV2 (COVID-19) presents known and unknown perioperative risks to the patient and operative staff. Pre-operative testing protocols have become widespread, yet little is known about the utility of this practice. We describe the impact of a testing protocol during the initial COVID-19 wave on the disposition of urologic surgeries in a rural academic hospital.

Methods: Pre-operative COVID-19 testing was implemented in May 2020 and data from all procedures were collected over the initial 90 day period. These were stratified by surgical division and disposition was assessed for all positive and indeterminate results. Health system protocol for this period required testing 3 to 5 days before elective surgery and immediately before urgent surgeries. Disposition assessed over a follow up period of 5 months.

Results: Total of 31 positive results for 7579 (0.41%) pre-procedural tests, including 3 of 792 (0.38%) for urologic procedures. Following a positive test, 20 procedures (62.5%) were delayed an average of 49 days, 8 were not performed and 3 proceeded without delay. 3 of 3 urologic procedures were delayed a mean of 59 days. Cost per test ranged from $34-$54. Number needed to test for one positive result was 244 with a cost of $11,573 for each positive result.

Conclusions: Institution of a universal pre-operative COVID-19 screening protocol in the early pandemic period identified clinically silent infection allowing for delay when appropriate. Cases were detected at a low frequency with a significant associated cost. This may be useful in triaging resources taking into account local conditions.

MP2-13

Moses Technology Improves Efficiency of Laser Lithotripsy for Patients Undergoing Mini-PCNL

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Introduction and Objective: The utilization of Lumenis Pulse™ 120H MOSES™ holmium laser is associated with improved operative times for treatment of urolithiasis through retrograde ureteroscopy. In this study, we compare the utilization of MOSES Technology with an industry standard holmium laser fiber during mini access percutaneous nephrolithotomy (MPCNL)

Methods: This is a retrospective case series of MPCNL, defined as PCNL with access diameter from 11-20F. All were performed at a single ambulatory surgical center between 2017 and 2020. Lithotripsy was performed using either MOSES or an industry standard holmium laser fiber. Patient and laser records were analyzed to evaluate laser performance with a primary endpoint of treatment efficiency score. Univariate statistics were performed using two tailed t-test and chi-squared test for continuous and categorical independent variables, respectively. Efficiency scores were calculated as the quotient of stone volume by laser utilization time.

Results: 140 patients met inclusion criteria. 79 patients underwent lithotripsy with a standard laser fiber and 62 patients with MOSES. There were no significant differences in patient age or comorbidity. Most stones were lower pole, renal pelvis or proximal ureter for both cohorts. Mean stone volume was 20.5 mm for patients who received MOSES and 18.5mm for patients treated with a standard fiber. The predicted post-procedure stone free rate was 95% for all patients. Procedures with MOSES resulted in significantly reduced operative times (85.9 min vs. 98.1 min, p = 0.03) and reduced intracorporeal treatment times (38.82 min vs. 44 min, p = 0.05). MOSES demonstrated improved treatment efficiency (2.4 vs. 1.8, p = 0.03) compared to the standard fiber. There was no significant difference in predicted post-procedure stone-free rate.

Conclusions: MOSES Technology demonstrates reduced operative times and intracorporeal operative time during MPCNL. In our series, MOSES Technology outperformed an industry standard holmium laser fiber in treatment efficiency with no significant differences in clinical outcomes.

MP3-01

Morbidity of Bladder Outlet Obstruction Treatment Following Radiotherapy for Prostate Cancer

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Introduction and Objective: There is no consensus on the best treatment for bladder outlet obstruction (BOO) in patients after radiation therapy. In this study we look at the morbidity of prostatic urethral lifts (PULs), laser photovaporization of the prostate (PVP), transurethral resection of the prostate (TURP), and transurethral incision of the prostate (TUIP) in the treatment of BOO in patients who have undergone radiotherapy for prostate cancer.

Methods: In this retrospective study, patients with a history of radiotherapy for prostate cancer who required a BOO procedure between October 2011 and September 2020 were investigated. Forms of radiation included external beam radiation (EBRT), brachytherapy (BT), EBRT + BT, and proton therapy (PT).

Results: Eighty-nine patients with a history of radiation underwent treatment for BOO between October 2011 and September 2020. Twenty-five, 28, 32, and 4 patients underwent PULs, PVP, TURP, and TUIP, respectively. The average time from radiotherapy to a BOO procedure was 6.9 years. Of the patients who underwent EBRT, BT, ERBT + BT, and PT, 48%, 47%, 62%, and 46%, respectively, needed additional procedures for BOO after their initial procedure. Of the patients who underwent PULs, PVP, TURP, and TUIP, 32%, 68%, 44%, and 75% of patients, respectively, required additional procedures. Incontinence was the most common adverse event in patients undergoing PULs, PVP, and TURP. (40%, 54%, and 28% of patients, respectively). Of the radiation treatments, EBRT + BT had the highest rate of incontinence at 69%.

Conclusions: Patients undergoing PULs required less subsequent procedures compared to patients undergoing TURP, PVP, or TUIP. PVP should be avoided as it had high rates of stricture formation, incontinence, and need for additional procedures. Regardless of the surgical approach, patients with BOO and a history of radiation need to be counseled on adverse side effects and the high likelihood of multiple additional procedures.

MP3-02

Evaluating Patient Priorities in Benign Prostatic Hyperplasia Treatment Using Conjoint Analysis

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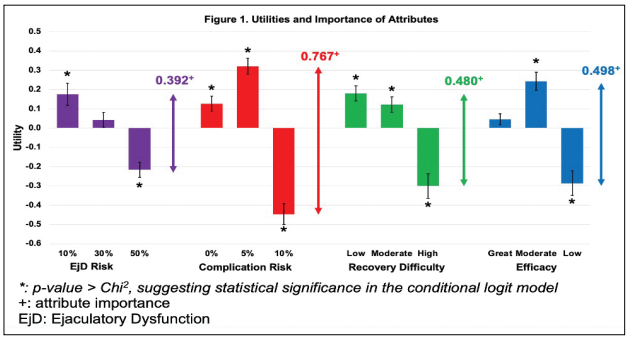
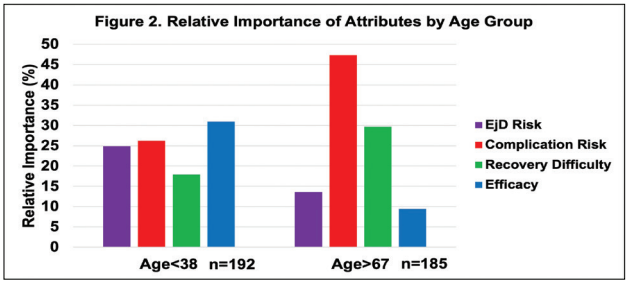
Introduction and Objective: Discordance between patient and urologist priorities for the treatment of benign prostatic hyperplasia (BPH) hinders patient-centered care. Physician assumptions regarding patient preferences lead to dissatisfied patients; a poor outcome in any quality of life surgery. American Urologic Association guidelines urge urologists to consider patient preferences when recommending a BPH treatment. Hence, the objective of this study is to quantify BPH patient preferences to promote guidelines-compliant, patient-centered care.

Methods: In this cross-sectional, online survey study using researchmatch.org, participants were required to decide between theoretical BPH treatments in a balanced, choice-based conjoint analysis. The treatments had varying levels of four attributes: efficacy, recovery difficulty, risk of complications (Clavien-Dindo 2+), and risk of de novo ejaculatory dysfunction. Demographic information and International Prostate Symptom Score (IPSS) were collected and analyzed using comparative statistics. Each attribute was analyzed using a conditional logit model, and attribute importance (range in utility between attribute-levels) was calculated (Figure 1).

Results: Out of 1235 recruited participants, 812 (66%) completed the study. Median IPSS and age was 6 (IQR 3-12) and 56 (IQR 38-67), respectively. Complication risk was the most important attribute (0.767), followed by efficacy (0.498), recovery difficulty (0.480), and risk of ejaculatory dysfunction (0.392). In a subgroup analysis of age quartiles (Figure 2), participants age <38 and >67 held efficacy (31%) and complication risk (47%) to the highest relative importance, respectively.

Conclusions: Males valued BPH treatments that minimize complication risks, while ejaculatory dysfunction was least impactful. Variation in results between age subgroups emphasizes the need for individualized care to maximize patient satisfaction.





MP3-03

Outcomes of Prostatic Urethral Lift (PUL) are Consistent Across Heterogenous Patient Populations in the Real World

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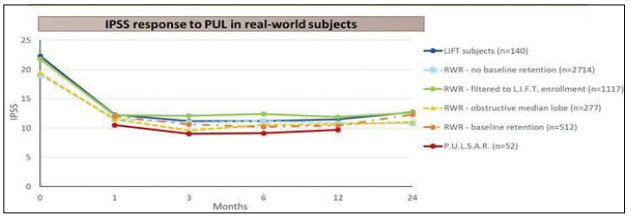
Introduction and Objective: Minimally invasive surgical therapy (MIST) for BPH should provide effective symptom relief with minimal morbidity as demonstrated in the real-world and in controlled studies. Here, we expand results from the large real-world retrospective (RWR) study of the minimally invasive PUL and compare to controlled studies.

Methods: The international RWR database includes 3226 PUL subjects (non-retention at baseline, n=2714; retention, n=512). Non-retention subjects were stratified by baseline symptoms (matching LIFT enrollment criteria (n=1117)), clinic office setting (n=883), prostate volume (≥80g, n=85), OML (n=277), prior radiation therapy for prostate cancer (rCaP) (n=82), and Parkinson's Disease (PD, n=16). Outcomes were compared to controlled trials for PUL: LIFT for non-retention, and the PULSAR controlled trial of 52 retention subjects.

Results: RWR subjects were on average 70yo with baseline IPSS, QoL, and Qmax of 19.2, 3.9, and 11.7 ml/s, respectively. Subjects who matched LIFT baseline criteria improved similarly to LIFT at 12 and 24 months. Outcomes of retention subjects were consistent with PULSAR. Subjects treated in the clinic office with local anesthesia significantly improved with lower rates of total AEs. Symptom response was equivalent between subjects with prostates ≥80g and <80g. OML subjects improved similarly to non-OML subjects, without increased rates of AEs. rCaP subjects improved from baseline without elevated levels of PSA. Absolute symptom response of PD subjects through 12 months and total AE rates were equivalent to non-PD subjects. Absolute IPSS was equivalent between retention and non-retention subjects.

Conclusions: This analysis of real-world PUL data demonstrates that symptom response and safety outcomes are largely consistent with controlled studies and across heterogenous groups, indicating that PUL is a viable treatment option for a broad variety of BPH patients in the real-world.



MP3-04

Sizeable data for Prostatic Urethral Lift (PUL) in retention patients: 12 month outcomes from the large real-world study and urodynamic results from PULSAR demonstrate PUL is safe and effective

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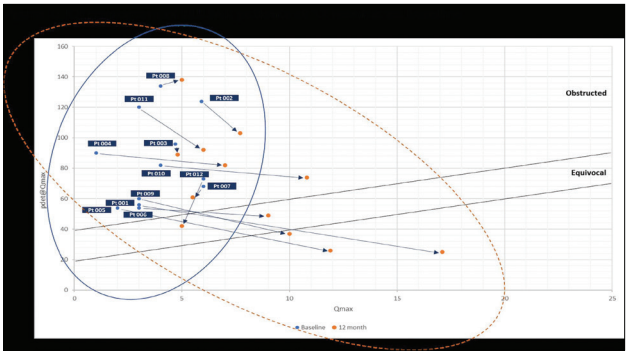
Introduction and Objective: Minimally invasive surgical therapies for BPH should be tested in real-world and controlled trial settings in various patient populations, including those in urinary retention. Here, we report outcomes of PUL in real-world retention patients real-world and in the controlled PULSAR study with newly analyzed urodynamics data.

Methods: The controlled PULSAR study followed 52 retention subjects with ≥1 failed TWOC on alpha blocker through12 months after PUL. Outcomes included SHIM, satisfaction, and urodynamics. The Real-World Retrospective (RWR) database included 512 subjects in active urinary retention status at the time of PUL. RWR retention (RWR-r) and PULSAR subjects were compared in baseline characteristics, absolute IPSS, QoL, Qmax, PVR, and AE and catheter-independence rates.

Results: Baseline characteristics were similar between RWR-r and PULSAR subjects (age: 71yo for both groups, prostate size: 48cc vs. 55cc, number of implants/patient: 4.7 vs. 4.8). 90% of PULSAR subjects felt better after PUL and 88% would recommend the procedure. Erectile function (via SHIM) was preserved in PULSAR subjects. Of 12 PULSAR subjects with urodynamics data, pdet@Qmax and BOOI improved by 23% and 41% (Fig 1). 86% of those who remained obstructed were catheter-independent and 83% felt very much better. Absolute IPSS, Qmax, and PVR were equivalent between RWR-r and PULSAR subjects at 12 months, but PULSAR QoL was better (1.4 vs. 2.1). RWR-r catheter-independence rates were better at 1 month post-PUL (81% vs. 60%) and longest available follow-up (84% vs. 73%). AEs overall were not elevated in RWR-r subjects compared to PULSAR.

Conclusions: This large RWR and the controlled PULSAR study reveal stable and largely consistent outcomes in retention patients at 12 months, indicating that PUL is safe and effective in this population of BPH patients.



MP3-05

Comparison of Rezum versus Urolift in the Management of Benign Prostatic Hypertrophy

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Introduction and Objective: Benign prostatic hypertrophy (BPH) affects roughly 50% men over the age of 50 and causes a variety of lower urinary tract symptoms (LUTS) which can significantly influence quality of life. Two methods of BPH treatment, Rezum and Urolift, have emerged as less invasive alternatives to TURP. Our objective was to assess the outcomes of Urolift and Rezum at the Lehigh Valley Health Network. The outcomes will include the international prostate symptom score, post-void residuals, prostate size and reoperation rates.

Methods: Retrospective review identified patients who underwent either Urolift or Rezum between January 1, 2019 and Apr 30, 2020. Self-reported American Urologic Association Symptom Index (AUASI) score, Quality of Life (QOL) score as well as post-void residuals (PVR), urinary flow rate (Qmax), number of follow-up phone calls, reoperation occurrence, retention and PSA variation were collected. Chi-square and Fisher's exact tests were used to compare categorical variables.

Results: Seventy-three and fifteen patients underwent Rezum and Urolift, respectively. Thirty-nine (53%) and 6 (40%) of patients who underwent Rezum and Urolift, respectively, demonstrated a reduction in the AUASI score over the course of 6 months. In the Rezum cohort, Qmax increased from an average 9.68±6.2mL/second (sec) pre-procedure to 12.11±7.2mL/sec at the three month follow up, and PVR decreased from an average 71.09±120mL to 61.34±131.93mL. In the Urolift cohort, the Qmax average decreased from 9.13±5.2mL/sec pre-procedure to 7.32±3.04mL/sec at the 6 month follow up, PVR decreased from an average 129.75±183.4mL to 81.14±79.4mL.

Conclusions: Our study demonstrates a decrease in overall self-reported and clinical symptoms from BPH with the Rezum procedure. The Urolift procedure demonstrated some reduction to LUTS, but a further study expanding the collection period is desired.

MP3-06

Is There a Role for Minimally Invasive Pyeloplasty in Children Less Than 20 kg?

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Introduction and Objectives: To assess if there is a difference in outcomes between open, laparoscopic and robotic pyeloplasty in children under 20 kg.

Methods: A retrospective analysis of all pyeloplasties done for children of weight under 20 kg was carried out. Indwelling stents were the standard of care. However, in smaller children, a ureteric catheter was placed as splint. Patient demographics, duration of surgery, length of hospital stay, postoperative complications and re-intervention rates were collected. Success was defined as resolution of symptoms or absence of hydronephrosis during the follow-up

Results: A total of 157 pyeloplasties was performed in children with a weight less than 20 kg between 2006 and 2018. Half of them were open pyeloplasty (OP, n = 78) procedures while laparoscopic pyeloplasty (LP, n = 52) and robotic pyeloplasty (RP, n = 27) made up the other half. Over the mean follow-up of 16.3 months, the success rates were comparable (98.7% vs. 96.2% vs. 96.3%) in the OP, LP and RP groups respectively. Mean operative time was significantly longer by 35 mins in both LP and RP groups when comparing with OP. Hospitalisation was significantly shorter in the minimally invasive groups (4 days) compared to the OP group (7days). Postoperative complications were not significantly different.

Conclusions: In our series, LP and RP had equivalent outcomes to OP with a shorter hospital stay. The minimally invasive approach in children less than 20 kg of weight should be reserved to centres with expertise as the benefit is currently small. Open pyeloplasty remains the gold standard in these small children.

	< 40cc (n=6)	40-79cc (n=24)	80-100cc (n=6)	>100cc (n=12)	Total (n=48)
CBI Clamped POD1, n (%)	6 (100%)	17 (71%)	4 (67%)	10 (83%)	37 (77%)
CBI Clamped POD2, n (%)	0 (0%)	7 (29%)	2 (33%)	2 (17%)	11 (23%)
Required CBI restarted, n (%)	0 (0%)	3 (12%)	2 (33%)	1 (8%)	6 (13%)
Average Hospital Days	1.9	1.8	2.0	1.9	1.9
Required Transfusion, n (%)	0 (0%)	1 (4%)	2 (33%)	1 (8%)	4 (8%)
Catheter Removed In Hospital, n (%)	6 (100%)	18 (75%)	3 (50%)	6 (50%)	33 (69%)
Catheter Removed in Office, n (%)	0 (0%)	6 (25%)	3 (50%)	6 (50%)	15 (31%)
Re-Presented to ED, n (%)	1 (17%)	5 (21%)	1 (17%)	1 (8%)	8 (17%)
Urinary Retention After Foley Removed, n (%)	0 (0%)	1 (4%)	0 (0%)	1 (8%)	2 (4%)
Clot Retention After Foley Removed, n (%)	0 (0%)	2 (8%)	1 (17%)	0 (0%)	3 (6%)
Clot Retention with Foley, n (%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	1 (2%)
Average POD of Complication	NA	5.4	10	2	7
Re-Admitted, n (%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	1 (2%)

Table 1: Post-operative outcomes of patients undergoing Aquablation stratified by gland size

Gland Size (cc)	Day CBI Clamped	Required Transfusion	Hospital Days	Catheter Removed POD#	POD Complication Occurred	Complication
57	1	No	2	-	4	Bladder Spasm
53	1	No	2	2	3	Urinary Retention
40	2	No	2	2	9	Clot retention
45	2	No	3	-	4	Clot retention w/ catheter in place
48	2	Yes	3	3	7	DVT/PE w/ clot retention
125	1	No	1	1	2	Urinary retention
40	1	No	4	1	7	Clot retention
80	1	No	3	1	10	Clot retention

Table 2: ED Visits and Re-Admissions for Patients within 30 days of Aquablation Treatment

MP3-07

Relationship Between Overactive Bladder Symptom Severity and Cystometric Bladder Capacity in Patients with Overactive Bladder

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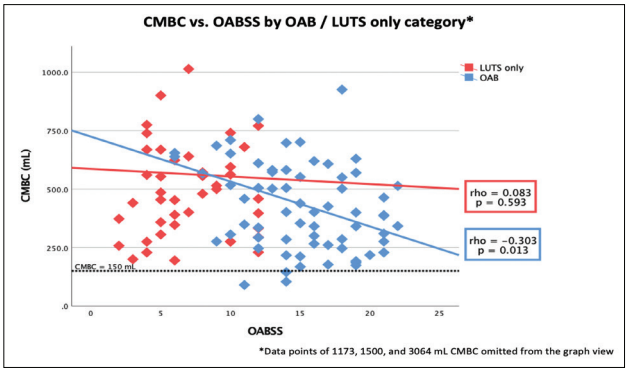
Introduction and Objective: Severity of overactive bladder (OAB) symptoms is thought to be related to bladder capacity. The aim of this study is to test the hypotheses that OAB patients have low cystometric bladder capacities (CMBC), and an inverse relationship exists between symptom severity of OAB and CMBC.

Methods: A database was searched for patients with lower urinary tract symptoms (LUTS) who had a 24-hour bladder diary, Overactive Bladder Symptom Score questionnaire (OABSS), videourodynamic study, uroflow, and post void residual urine. Patients were grouped based on OABSS: (1) OAB (with or without other LUTS) and (2) LUTS without OAB. Exclusion criteria were neurogenic bladder, UTI, and incomplete data. The relationship between OABSS and CMBC was calculated via Spearman's nonparametric rank correlation coefficient and mean difference via independent sample t-test.

Results: We identified 173 patients; 110 patients were included (mean age = 67). There were 67 women and 43 men; 66 had OAB and 44 had LUTS-only. Mean CMBC of OAB group was lower than LUTS-only (436 mL vs. 564 mL, t = 2, p = .05). Mean OABSS of OAB group was higher than LUTS-only (15 vs. 7, t = 11, p < .001). There was an inverse correlation between CMBC and OABSS. Half of the OAB group had a bladder capacity > 400 mL and 41% > 500mL.

Conclusions: In this study of patients with LUTS, CMBC was mostly normal, but lower than that of patients without OAB. Symptom severity was inversely related to bladder capacity in OAB patients, but not in those without OAB. The observation that many patients with OAB had CMBC > 500 mL casts some doubt on the role of bladder capacity in the genesis of OAB symptoms.



MP3-08

Stress Incontinence Outcomes Following Robotic Prostatectomy: Interim Analysis of Novel Pelvic Floor Program

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Introduction and Objective: The AUA Guideline for incontinence after prostate treatment recommends that clinicians offer pelvic floor muscle training (PFMT) in the immediate post-operative period. The UVA prostatectomy functional outcomes program (PFOP) was developed in 2018 to comprehensively assess and optimize continence outcomes following radical prostatectomy. Enrolled patients completed specialized in-house pelvic floor muscle training (PFMT) directed by a fellowship-trained FPMRS specialist. PFMT sessions were conducted at baseline, 3-months, 6-months, and 12-months following surgery and were supplemented by a home exercise program.

Methods: We performed an interim analysis of 14 PFOP patients achieving 6-month follow-up after robotic prostatectomy. As part of ongoing prospective assessment, patients complete the validated ICIQ-MLUTS and IIQ-7 questionnaires. Comparison of questionnaire items focused on SUI and QOL was performed and compared to 18 non-PFOP patients undergoing prostatectomy. Non-PFOP patients received standard PFMT education provided by their treating urologic oncologist.

Results: Mean patient age, EBL, proportion of patients undergoing adjuvant radiotherapy, pelvic lymph node dissection, and baseline SUI domain scores were similar in the PFOP versus non-PFOP cohorts (p=NS, all comparisons). ICIQ-MLUTS SUI domain items scores across all time points are shown in Figure 1. At 6-month follow-up, men enrolled in PFOP demonstrated significantly improved domain scores when compared to controls (PFOP 0.85 (SD 1.12); non-PFOP 1.72 (SD 1.53))(p<0.05). A higher proportion of PFOP patients reported absence of incontinence, defined as SUI domain score of 0 (PFOP 7/14 (50%); non-PFOP 5/18 (28%)). Similar pad per day quantity was reported across the cohorts.

Conclusions: Specialized in-house PFMT performed by a fellowship-trained physician is associated with improved SUI outcomes and quality of life at 6-month follow-up. Patient accrual is ongoing to more comprehensively assess continence outcomes with minimum 12-month follow-up.

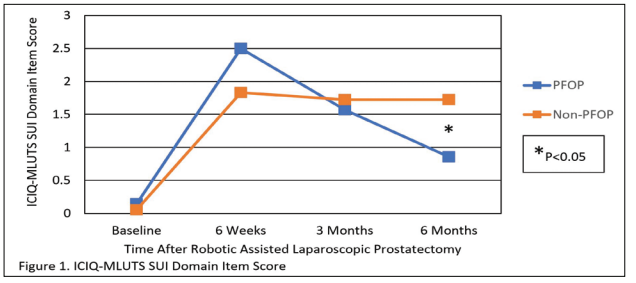

Figure 1. ICIQ-MLUTS SUI Domain Item Score

MP3-09

Post-Phalloplasty Urinary Function Test: A Novel Outcome Instrument to Capture Urinary Dysfunction and Quality of Life after Phalloplasty

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Introduction and Objective: Due to decreased stigma and mounting evidence for gender affirmation surgery the number of phalloplasties performed the past decade has increased dramatically. Existing research focuses on surgical complications and aesthetic outcomes, while few have assessed functional urologic outcomes. In trans men there is currently no accepted post phalloplasty specific urinary questionnaire. The objective of this study is to present our novel outcome instrument the Post-Phalloplasty Urinary Function Test (PPUFT) and our protocol to measure post void urethral volume (PVUR). We present our findings on current patients who have undergone phalloplasty and urethral lengthening.

Methods: We conducted an initial validation study in a cohort of 15 adult trans men who had undergone phalloplasty with urethral lengthening surgery between 2018 and 2021 by a single surgical team. Patients had stable urinary function via the neophallus at time of survey. Patients filled out the PP UFT and were asked to record their PVUR per our protocol.

Results: In this study, the PP UFT had an average score of 8.86 out of 40, average quality of life (QOL) score was 2.6. Post void dribbling constituted the major complaint and on average comprised 63% of the reported PP UFT score. Average PVUR was 2.16 ml (range 0.5-5.6 ml). Statistical analysis was limited; however, there was a positive correlation between higher PP UFT and worse reported quality of life.

Conclusions: There is a paucity of urinary function studies in trans men after phalloplasty. We report our novel outcome instruments in a cross-sectional study. PVUR and post void dribbling is a significant detriment to quality of life and encompasses most of the urinary complaints in this population.

Patient Demographics	
Age	31 years (20-44 years old)
Days between Surgeries	252 days (106-405 days)
History of Stricture	6 (40%)
History of Fistula	5 (33%)
Pre Op Creatinine (Cr)	0.95 mg/dL (0.7-1.3 mg/dL)
Post Op Creatinine (Cr)	0.89 mg/dL (0.7-1.2 mg/dL)
Survey Findings	
PP UFT	8.86 (1-30)
PVUR	2.16 ml (0.5-5.6 ml)
QOL	2.6 (0-6)
Dribble Score	4.07 (0-5)

Adherence with Specific Recommendations		
	Recommended (N)	Number Compliant (%)
Diagnostic	33	8 (24.2%)
Renal bladder US	21	1 (4.7%)
CT Abdomen Pelvis	4	2 (50%)
Repeat UDS	8	5 (62.5%)
Pharmacotherapy	111	100 (90.0%)
Continue current medications	54	50 (92.5%)
Change medication regimen	57	50 (87.7%)
Other therapies	89	49 (55.1%)
PFPT (Pelvic Floor Physical Therapy)	3	2 (66.7%)
Botulinum Toxin Injections	25	17 (68%)
Sacral neuromodulation	23	8 (34.8%)
PTNS (Peripheral tibial nerve stimulation)	9	4 (44%)
Other surgery (Sling, TURP, Augmentation cystoplasty)	29	18 (62.1%)
Change in bladder Management	30	26 (86.7%)
Rec SPT	17	14 (82.4%)
Rec CIC or indwelling	13	12 (92.3%)

MP3-10

Adherence with Imaging and Treatment Recommendations Following Urodynamics Testing in Patients with Neurogenic Bladder

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Introduction and Objective: Adults with neurogenic bladder (NGB) face challenges in pursuit of diagnostic and management recommendations with potentially unfortunate implications. We sought to characterize adherence with provider recommendations following urodynamics testing (UDS) in patients with NGB, and factors that may be associated with clinical consequences.

Methods: We reviewed records of adult patients with NGB who underwent UDS from 7/2018-7/2020. Overall "non-adherence" was defined as failure to pursue recommended testing, treatment, or follow-up within the recommended time frame; sub-analyses evaluated adherence with specific recommendations. Consequences of non-adherence were assessed as urinary tract infections (UTIs) and urologic acute care visits 6 months following post-UDS provider recommendations.

Results: Mean age of the 135 patients was 55 +/- 17.6 years, and 48 (36%) were male. 90 patients (67%) were compliant with all recommendations, and 42 patients (31%) were not (Table 1). Patients with suprasacral spinal cord injury had the lowest rates of adherence (41%). 24% (8/33) were compliant with recommended diagnostic testing, with adherence to other recommendations ranging from 35% (sacral neuromodulation) to 92% (continue current medications) (Table 2). We did not observe any clear association between adherence and 6-month UTI frequency (p=0.88) or urologic ER visits (p=0.12) or hospitalizations (p=0.55).

Conclusions: Even among adults with NGB who demonstrate the capacity to obtain care based upon pursuit of UDS, fewer than one-third may be able to comply with subsequent care recommendations. Adherence with imaging and procedural interventions may be particularly challenging. Optimal care for patients with NGB requires attention to barriers in pursuit of recommended testing and treatment.

Table 1: Predictors of Adherence					
	Compliant with recommendations (N=90)	Percent %	Noncompliant with recommendations (N=42)	Percent %	P - value
Sex					0.69
Men	61	68.5%	28	31.5%	
Women	29	64.4%	16	35.6%	
Insurance Type					0.31
Medicare	27	30.0%	10	22.7%	
Medicaid	26	28.9%	12	27.3%	
Private	35	38.9%	19	43.2%	
Other or none	2	2.2%	3	6.8%	
Average distance from office (mi)	13.5 (+/-15.7)		12.3 (+/- 16.4)		0.69
Living Circumstance					0.18
Home with self/family	70	70%	30	30%	
Home with full time care	9	69.2%	4	30.7%	
Nursing Facility	8	42.1%	11	57.9%	
Type of Injury					0.18
Suprapontine Injury (CVA, TBI, CP, Parkinson's)	33	36.7%	9	21.4%	
Suprasacral injury (SCI, DDD, SC Surgery, spina bifida)	38	42.2%	26	61.9%	
Sacral and Peripheral Injury (cauda equina, pelvic surgeries)	7	7.8%	4	9.5%	
Demyelinating disorder	12	13.3%	3	7.1%	
UDS Findings					
Abnormal Compliance (bladder compliance < 30)	27	32.9%	14	35%	0.840
High filling pressures (Pdet Max > 40 cm H2O)	22	29.7%	22	55.0%	0.010
Detrusor Overactivity	68	77.3%	33	75.0%	0.829
Stress urinary incontinence	10	11.6%	10	23.3%	0.120
Unable to generate volitional void	33	40.2%	21	48.8%	0.879
Sphincter dyssynergia	40	56.3%	20	58.8	0.836
Vesicoureteral reflux	10	14.3%	1	3.6%	0.171

MP3-11

The Underachieving Results for Overactive Bladder

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Introduction and Objective: Overactive bladder (OAB) is highly prevalent. 75% of patients admit to using Internet searches as a primary source for health information. With telemedicine on the rise, this is expected to increase. We aim to evaluate the readability of online resources for OAB treatment.

Methods: Google and Bing were used to query "sacral neuromodulation," "peripheral tibial nerve stimulation (PTNS)," and "bladder botox." The first 20 results from each were assessed, representing over 90% of accessed search results. Duplicate websites, paid advertisements, and video only websites were excluded. Websites were categorized as either institutional/reference, commercial, non-profit, or personal. Three validated readability scores (Gunning-Fog (GF), SMOG, and Dale Chall (DC)) were used to assess the readability of these results and compared to the National Institutes of Health recommended grade 6-7 level.

Results: Sacral neuromodulation yielded 27 eligible results .The mean score for GF, SMOG, and DS (with standard deviation) were: 16.0 (3.14), 11.9 (2.10), and 9.7 (0.87), respectively. These correlate to levels of college senior, high school junior and college level. PTNS yielded 31 eligible results. The mean score for GF, SMOG, and DS were: 16.7(3.38), 12.5 (2.42), and 9.7 (0.84), respectively. These correlate to levels of college senior, high school senior, and college level. Bladder botox yielded 17 eligible results. The mean score for GF, SMOG, and DS were: 13.9 (2.88), 10.3 (2.07), and 9.2 (0.84), respectively. These correlate to levels of college sophomore, high school junior, and college level. There was no difference between the therapy types in terms of readability. 61% of websites were institutional/reference, 24% commercial, 13% non-profit, and 2% personal. Institutional/reference tended to have higher scores although this was not significant.

Conclusions: Information regarding OAB treatment is provided at a level difficult to interpret by the general population. These findings highlight a need for improvement in quality of online information.

MP3-12

MRI Fusion Targeted Confirmatory Prostate Biopsy Improves the Selection of Men with Prostate Cancer for Active Surveillance

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Introduction and Objectives: Men on active surveillance for low-risk prostate cancer are recommended to undergo confirmatory biopsy within a year of diagnosis. The only randomised trial (ASIST trial) in this population failed to show an improvement in upgrading rates with targeted biopsy compared to systematic biopsy at the first confirmatory biopsy. We aim to evaluate our series of men on active surveillance who underwent concurrent systematic and MRI fusion targeted confirmatory biopsy.

Methods: From our prospectively maintained MRI fusion targeted biopsy database at our institution, we identified patients on active surveillance who underwent biopsy from May 2016 to Dec 2019. Inclusion criteria for our study were patients with at least one Prostate Imaging Reporting and Data System (PI-RADS) ≥ 3 lesion, and who underwent targeted and systematic biopsies. Upgrading was defined as any newly detected clinically significant prostate cancer (csPCa) of Gleason grade group ≥ 2.

Results: A total of 61 patients were identified, with a median age of 71 years (interquartile range [IQR] 67-75), median prostate-specific antigen of 7.26 ng/ml (IQR 5-10) and median Prostate Health Index (PHI) level of 34.5 (IQR 18-44). Upgrading to csPCa was found in 41% (n = 25) of patients. Targeted biopsies upgraded 9 (14.8%) patients who did not have csPCa with systematic confirmatory biopsy alone.

Conclusions: MRI fusion targeted confirmatory biopsy upgrades a significant proportion of men with previous low-risk prostate cancer and improves the selection of patients suitable for active surveillance.

Figure: Probability of spontaneous voiding recovery by injury type

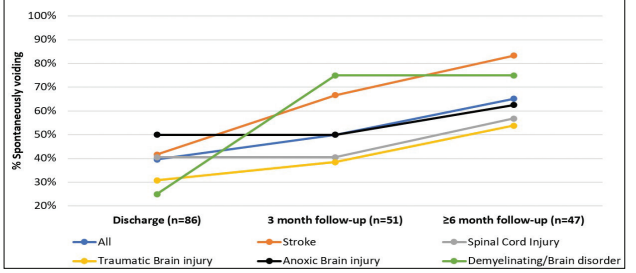

Table: Summary of return of urinary function by type of neurologic insult

	All	Stroke	Spinal Cord Injury (SCI)	Traumatic Brain Injury (TBI)	Anoxic Brain Injury	Demyelinating/ Brain Disorder
Total	86	24 (28%)	37 (43%)	13 (15%)	8 (9%)	4 (5%)
Male	58 (67%)	17 (71%)	23 (62%)	10 (77%)	5 (63%)	3 (75%)
Age (years, median, IQR)	65 (53-72)	69 (59-73)	62 (52-70)	64 (60-73)	62 (52-66)	63 (55-65)
Diabetes	27 (31%)	13 (54%)	11 (30%)	0	1 (13%)	2 (50%)
No prior urinary medications	59 (69%)	18 (75%)	23 (62%)	12 (92%)	4 (50%)	2 (50%)
Tamsulosin at time of consult	41 (48%)	12 (50%)	16 (43%)	5 (38%)	6 (75%)	2 (50%)
Days from injury to consult (median, IQR)	21 (14-33)	21 (12-26)	22 (16-36)	19 (12-21)	23 (16-45)	38 (25-50)
Discharge urinary symptoms						
Spontaneously voiding	34 (40%)	10 (42%)	15 (41%)	4 (31%)	4 (50%)	1 (25%)
Retention	52 (60%)	14 (58%)	22 (59%)	9 (69%)	4 (50%)	3 (75%)
Follow-up at 3 months	**51 (59%)**	**11 (46% of stroke cohort)**	**25 (68% of SCI cohort)**	**7 (54% of TBI cohort)**	**6 (75% of anoxic cohort)**	**2 (50% of cohort)**
Spontaneously voiding	28 (55%)	8 (73%)	11 (44%)	3 (43%)	4 (67%)	2 (100%)
On tamsulosin	14 (50%)	4 (50%)	5 (45%)	2 (67%)	2 (50%)	1 (50%)
Involuntary leakage	3 (6%)	1 (9%)	2 (8%)	0	0	0
Retention	23 (45%)	3 (27%)	14 (56%)	4 (57%)	2 (33%)	0
On tamsulosin	9 (39%)	1 (33%)	4 (29%)	2 (50%)	2 (100%)	0
Clean Intermittent catheterization	7 (14%)	1 (9%)	4 (16%)	1 (14%)	1 (17%)	0
Indwelling urethral catheter	7 (14%)	1 (9%)	4 (16%)	2 (29%)	0	0
Suprapubic catheter	9 (18%)	1 (9%)	6 (24%)	1 (14%)	1 (17%)	0
Additional follow-up (6-24 months)	**47 (54%)**	**11 (46% of stroke cohort)**	**23 (62% of SCI cohort)**	**7 (54% of TBI cohort)**	**5 (63% of anoxic cohort)**	**1 (25% of cohort)**
Spontaneously voiding	37 (78%)	10 (91%)	16 (70%)	5 (71%)	5 (100%)	1 (100%)
On tamsulosin	12 (32%)	5 (50%)	4 (25%)	2 (40%)	0	1 (100%)
Involuntary leakage	2 (4%)	0	2 (9%)	0	0	0
Retention	10 (21%)	1 (9%)	7 (30%)	2(29%)	0	0
On tamsulosin	3 (30%)	1 (100%)	1 (14%)	1 (50%)	0	0
Clean Intermittent catheterization	1 (2%)	0	1 (4%)	0	0	0
Indwelling urethral catheter	1 (2%)	0	0	1 (14%)	0	0
Suprapubic catheter	8 (17%)	1 (9%)	6 (26%)	1 (14%)	0	0
Voiding at last charting (inpatient or outpatient follow-up)	**56 (65%)**	**20 (83%)**	**21 (57%)**	**7 (54%)**	**5 (63%)**	**3 (75%)**

MP3-13

Patient Perceptions of Pelvic Organ Prolapse Education Techniques

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Introduction and Objective: Limited patient understanding due to challenges in physician-patient communication and inadequate patient education materials (PEMs) can result in poor outcomes after pelvic organ prolapse (POP) repair. Our objective was to identify the process by which patients learned about POP and review their perception of available educational tools.

Methods: Patients with history of POP were recruited using ResearchMatch and invited to participate in a virtual semi-structured interview where they were shown a website, brochure, and video pertaining to POP. Information regarding patient preference for PEMs was obtained. The interviews were transcribed, coded, and qualitative data analysis was performed using grounded theory methodology.

Results: Qualitative analysis of interviews of eleven participants averaging 54 years old yielded several preliminary themes including: insufficient information to guide treatment decisions, desire for multimodal and comprehensive information packets, lack of support, and an increase in self-advocacy mechanisms. Emerging concepts included: participants feeling uninformed and distrustful towards treatment options offered during their physician visits, participants preferring multi-modal materials as a supplemental guide to treatment decisions, and participants feeling isolated around their diagnosis which led to them become lost to follow up. As a result, they developed self-reliant strategies for making treatment decisions including the use of online resources, speaking with family and friends, and finding their own treatment options.

Conclusions: Women with POP reported lack of information and support which resulted in the generation of self-coping mechanisms. This led to significant anxiety surrounding their diagnosis and treatment. Developing a reproducible methodology to create evidence-based PEMs will significantly decrease patient misinformation, apprehension, and use of inaccurate sources of information.

Table 1: Preliminary themes and illustrative quotes pertaining to those themes

Preliminary Themes	Illustrative Quotes
Insufficient information to guide treatment decisions	"I still felt in a position where I had to do the majority of the research. I wish that I had something that was succinct and laid out." "No, my doctor didn't say anything about a pessary" "I wish they would explain that there are other options we could try first before surgery"
Desire for multimodal and comprehensive information packets	"I would love something interactive talking about what the repercussions of cystocele at each stage." "I love the diagrams. There have been so many times when I wished I had something to show people so I could explain what was going on." "I love how much information is here about the different treatment options including the different types of surgeries. I didn't know any of this." "Especially, I like the fact that they showed video of actual women with prolapse I liked the fact that they did drawings and showed you exactly where the muscles are that that are being affected."
Lack of Support	"I remember asking on their message board, hey, how do people deal with this? Do I mean? Do I basically need to use an enema anytime I'm planning to have intercourse? And just felt horrified about the situation? And to their credit? They said, No, you know, you just need to, you know, basically, tell your husband the truth about what's going on, and you'll work through it together, it'll be okay." "Sometimes just hearing 'you're not alone, this happens to people, and sometimes we don't even know why' makes you feel a whole lot better than hearing nothing."
Self- Advocacy Mechanisms	"Right now my uterus is prolapsing severely. It's not coming all the way out, which I heard they do. I have to put it back in. It's not a lot of fun. So I'm trying to figure out what to do. I signed up for an online conference about natural methods to reduce prolapse, but I am worried I might end up needing to go back to the doctor. Anyways, that's how I find out about options and I continue to find out about them." "I bought this naturopath's book and tape. And you know, watch it and follow the exercises she gives for pelvic organ prolapse. She thinks that Western medicine doesn't tell you what good posture is."

MP4-01

Association of Tumor Size and Surgical Approach with Oncological Outcomes in Patients with Adrenocortical Carcinoma

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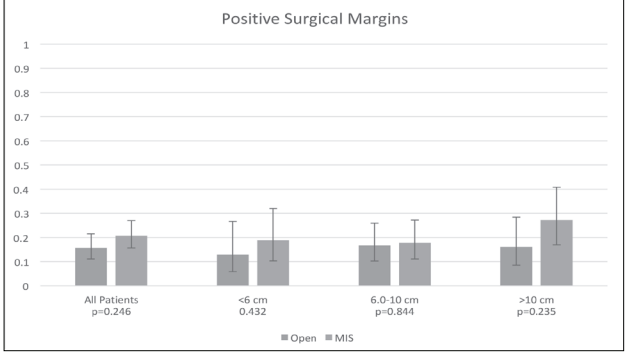
Introduction and Objective: We investigated the oncological outcomes for patients with masses ≤6 cm, 6-10 cm, and >10 cm in size treated with minimally invasive adrenalectomy (MIA) compared with open approach (OA).

Methods: We reviewed the National Cancer Database for patients undergoing adrenalectomy for cT1-3N0M0 Adrenocortical Carcinoma (ACC) from 2010 to 2017. We performed 1:1 nearest neighbor propensity score matching within each size strata to adjust for differences between patients treated with OA and MIA with regards to clinical T stage, age, race, sex, comorbidity score, and insurance type. We compared proportion of patients with positive surgical margins (PSM) using the chi-squared test and fit Cox proportional hazards models to test for an association between surgical approach and overall survival (OS) with and without adjusting for size.

Results: After matching, the analytic cohort consisted of 428 patients, equally split between OA and MIA. Covariates were balanced between the cohort and within each size strata. A similar proportion of patients had PSM when treated with OA compared with MIA among all patients and within each size strata (Figure 1). Patients treated with MIA had similar OS in our Cox proportional hazards without and with adjusting for size (HR 1.15, 95% CI: 0.86-1.53, p=0.341 and HR 1.15, 95% CI 0.87-1.54, p0.329).

Conclusions: Patients with ACC had similar incidence of PSM and OS when treated with OA and MIA. Although not statistically significant, patients with masses >10 cm had increased PSM when treated with OA vs. MIA. OA remains the standard of care for patients undergoing adrenalectomy for ACC; future investigations are needed to help inform guideline statements regarding the appropriate use of MIA vs. OA.

Figure 1. Proportion of patients with positive surgical margins treated with OA compared with MIA in the propensity score match cohort. Error bars display 95% CI.



MP4-02

Residual/Upgraded Disease at Time of Re-TUR When Bluelight Cystoscopy Used as Primary Procedure for Non-muscle Invasive Bladder Carcinoma

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Introduction and Objective: Current guidelines recommend planned repeat transurethral resection (TUR) after whitelight cystoscopy (WLC) for high-risk non-muscle invasive bladder cancer (NMIBC). Recent studies have demonstrated that Blue Light Cystoscopy (BLC) increases tumor detection during initial resection. This study sought to compare the rates of residual disease and upgrading in patients treated with and without BLC at a single institution.

Methods: Our institutional cancer database was retrospectively queried for patients who underwent TUR for NMIBC from 2014 to 2020. Information regarding disease grade, stage, "upstaging", and use of bluelight optics was extracted. "Upgrading" was defined as higher grade or cT stage at re-TUR. Descriptive statistics, chi-square tests, and the Cox Proportional Hazards model were used for analysis.

Results: A total 92 patients were included. Overall, 28 patients had BLC at their first procedure, and 64 had WLC first with subsequent BLC. In total, 43% and 36% of high-risk patients received re-TUR, in the BLC-initial and WLC-initial groups, respectively. The rates of residual or upgraded disease at re-TUR were 42% for the BLC-initial group compared to 78% for the WLC-initial group (RR 0.37, 95% CI 0.15-0.93; P=0.07). Among patients with "high risk" NMIBC, the rates of residual or upgraded re-TUR were 43% for the BLC-initial group compared to 69% for the WLC-initial group (RR 0.67; 95% CI 0.31-0.43; P=0.5). Multivariable analysis revealed no significant impact for upgrading/residual disease at re-TUR when adjusting for age, current tobacco use, disease stage at first TUR, and use of BLC at initial procedure (LR 2.23, P = 0.69).

Conclusions: Using BLC at initial TUR resulted in lower rates of residual disease compared to initial WLC. Despite initial BLC use, residual disease was found in 43%, reinforcing the role in planned re-TUR for high-risk patients in this setting. Future analysis with additional patients will increase the statistical power comparing these two groups.

MP4-03

Social Factors Influence Treatment Decisions in Node-Positive Non-Metastatic Bladder Cancer

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Introduction and Objective: Though historically grouped in with true metastatic disease and treated with palliative chemotherapy, those with clinically node-positive non-metastatic bladder cancer have been the target of several recent studies aiming to establish a standard of care for this potentially treatable population. Prior retrospective studies have indicated that patients treated with combination chemotherapy and radical cystectomy (RC) have prolonged survival compared to other therapies. The objective of this study is to identify if social factors influence treatment in this patient population.

Methods: Data from the National Cancer Database was used to identify patients who had node-positive non-metastatic bladder cancer disease who received chemotherapy alone or in combination with radical cystectomy (RC) or radiotherapy. We identified 3,481 eligible cases who were included in the final analysis. Baseline patient demographic data was compared using ANOVA test for continuous variables, and Chi-square test for categorical variables.

Results: There was a significant difference between the groups regarding age, racial distribution, facility type and insurance status. Patients were more likely to receive RC if they were: of younger age, of white race, receiving their care at an academic hospital, and/or privately insured. There were no differences noted regarding sex, median household income, or highest level of education. (Table 1)

Conclusions: Prior studies have indicated that there is a survival benefit for chemotherapy plus RC in this patient population. This study identifies social factors that appear to influence treatment decisions, which may in turn, influence survival.

Variables	**Group 1** Chemotherapy only	**Group 2** Radical Cystectomy and Chemotherapy	**Group 3** Chemo-Radiotherapy	**Group 4** Radical Cystectomy and Chemo-Radiotherapy	P value
No.	1312 (37.7%)	1316 (37.8%)	726 (20.9%)	127 (3.6%)	
Patient demographics					
Age, mean (SD)	66.97 (11)	63.80 (9.68)	69.42 (11.69)	64.28 (10.21)	**0.000**
Male, n. (%)	954 (72.7%)	945 (71.8%)	508 (70%)	86 (67.7%)	0.437
White, n. (%)	1167 (88.9%)	1210 (91.9%)	635 (87.5%)	117 (92.1%)	**0.005**
Primary payer n. (%)					**0.000**
uninsured	60 (43.2%)	48 (34.5%)	26 (18.7%)	5 (3.6%)	
private	411 (34.9%)	560 (47.5%)	167 (14.2%)	40 (3.4%)	
Medicaid	104 (39.8%)	92 (35.3%)	54 (20.7%)	11 (4.2%)	
Medicare	724 (39%)	597 (32.1%)	467 (25.2%)	69 (3.7%)	
Other government	13 (28.3%)	19 (41.3%)	12 (26.1%)	2 (4.3%)	
Facility type, n. (%)					**0.000**
Community	119 (38.01%)	90 (28.7%)	83 (26.5%)	21 (6.7%)	
Comprehensive	484 (36.9%)	389 (30.4%)	354 (27.7%)	50 (3.9%)	
Academic/Research	544 (35.3%)	741 (48.08%)	216 (14.01%)	40 (2.5%)	
Integrated cancer program	165 (47.1%)	96 (27.4%)	73 (20.8%)	16 (4.5%)	

Table 1: demographic and treatment data

MP4-04

Treatment Failure and Disease Progression of Non-Muscle Invasive Bladder Cancer During BCG shortage

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Introduction and Objective: Intravesical bacillus Calmette Guérin (BCG) instillations play an integral role in the treatment of non-muscle invasive bladder cancer (NMIBC). With the BCG shortage in the U.S., reduced dosing protocols were implemented for induction and maintenance treatment cycles to meet patients' needs. In this study, we evaluate the effect of reduced induction BCG dosing on the rate of BCG failure and progression of NMIBC.

Methods: A retrospective chart review of the electronic medical records (EMR) was performed of patients with NMIBC treated at our institution. A total of 300 patients were treated during the period of BCG shortage (1/2017-5/2021). EMR was reviewed for the pathology at diagnosis, size of tumor at initial resection, BCG induction dose, and pathology of recurrence. Patient were assigned risk categories according to the National Comprehensive Cancer Network (NCCN) guidelines into intermediate or high risk. BCG failure was defined as persistence or recurrence of high grade disease after a complete BCG induction course. Progression was defined as development of lamina propria/muscle invasion, or grade upstage.

Results: 300 patients were treated with BCG during the period of the study (115 intermediate risk, 185 high risk) (Table 1). The rate of BCG failure in the reduced BCG group was elevated in the intermediate risk (RR 2.29) and total patient population(RR 1.19). The rate of disease progression in the reduced BCG group was elevated in in the intermediate (RR 1.71) , high (RR 1.36) and total groups (RR 1.49).

Conclusions: Reduced BCG induction dosing for NMIBC can lead to increased rates of BCG failure and disease progression. Further research is warranted to identify the pathologies at highest risk for recurrence and progression.

Risk Category	BCG failure/Total patients (25 mg)	BCG failure /Total patients (50 mg)	Risk of BCG failure (CI)	P-value	Progression /Total patients (25 mg)	Progression /Total patients (50 mg)	Risk of progression (CI)	P-value
Intermediate risk	10/35	10/80	2.29 (1.04-5.00)	0.038	6/35	8/80	1.71 (0.64-4.57)	0.28
High risk	24/63	49/122	0.95 (0.65-1.39)	0.88	7/63	10/122	1.36 (0.54-3.39)	0.52
Total	34/98	59/202	1.19 (0.84-1.68)	0.33	13/98	18/202	1.49 (0.76-2.910	0.25

MP4-05

Management of Non-Muscle Invasive Bladder Cancer in a Time of BCG Shortage

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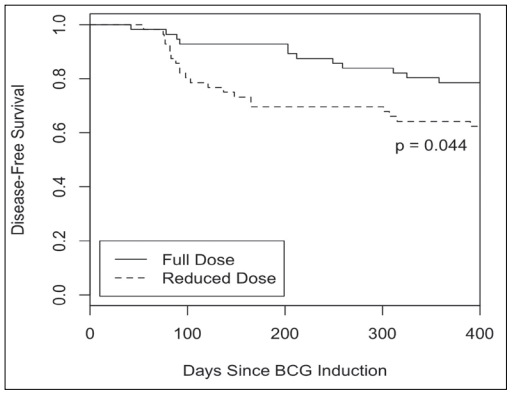
Introduction and Objective: The current shortage of BCG has made allocation of limited resources for the treatment of high-grade non-muscle invasive bladder cancer (NMIBCa) challenging. We evaluated the efficacy of reduced dose (RD) BCG in prolonging disease-free survival and preventing recurrence of NMIBCa in the time of BCG shortage.

Methods: Medical records of patients presenting to Penn for management of NMIBCa requiring intravesical BCG between 2015 and 2020 were reviewed. In 2019, we began to provide RD BCG, which was based on the available allotment at the time and thus did not follow any protocol for splitting. Inclusion criteria were tissue diagnosis of NMIBCa treated with TURBT followed by induction BCG. Propensity score matching was used to pair RD patients to full dose (FD) patients based on age, tumor pathology, and initial vs. recurrent disease.

Results: 140 patients with high grade NMIBCa were identified. 56 received RD BCG (median dose 123 mg), and the remainder received FD BCG (300 mg). There was no significant difference between groups in age, sex, or prior history of bladder cancer. Disease-free survival at 400 days was 79% in the FD treatment compared to 63% in the RD treatment (p = 0.097). Among patients with recurrent disease after BCG, median disease-free survival was 98 days in RD patients and 208 days in FD patients (p = 0.15). The 400-day disease-free survival was significantly greater among patients who received FD BCG compared to those who received RD BCG (p = 0.044).

Conclusions: RD BCG for NMIBCa seems to increase the risk of recurrence compared to FD therapy. These data indicate a need for further investigation to determine the optimal therapy in the setting of the current shortage.



MP4-06

Physicians' Knowledge About Pembrolizumab for High-Risk Non-Muscle Invasive Bladder Cancer: Quality Improvement Targets in Multidisciplinary Cancer Care

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Introduction and Objective: In 2020, pembrolizumab received accelerated approval for treatment of BCG-unresponsive CIS +/- papillary disease (high-grade Ta or T1 tumors) for patients ineligible for or who have elected to forego radical cystectomy (RC). Practical considerations of pembrolizumab utilization after this approval have not been well described.

Methods: We assessed urologists' and medical oncologists' level of awareness of pembrolizumab for treatment of high-risk non-muscle invasive bladder cancer (HR-MIBC) and data supporting its use. Using snowball sampling via Twitter and targeted emails from 12/2020-1/2021, we administered an online survey assessing understanding and patterns of utilization of pembrolizumab for HR-NMIBC.

Results: Fifty providers who treat NMIBC completed the questionnaire; 66% (n=33) were urologists, and 34% (n=17) were medical oncologists. Nearly 75% (n=37) prescribed pembrolizumab for HR-MIBC or referred a patient for treatment. Most commonly cited reason for choice of pembrolizumab over RC was patient refusal rather than RC ineligibility. Nearly one-third (32%, n=16) failed to correctly identify the FDA approved indication for prescribing pembrolizumab; nearly two-thirds (64%, n=32) were unable to recognize the FDA definition of BCG unresponsive NMIBC as "persistent or recurrent CIS, with or without recurrent Ta/T1 disease within 12 months of completing BCG." The majority of our cohort over-estimated true response rate or duration of response to pembrolizumab (46% [n=23] provided the correct one-year complete response rate of 18%). No differences in knowledge assessment answers were noted by specialty.

Conclusions: The use of systemic immunotherapy in a historically surgeon-driven management pathway presents a unique challenge for both urologists and oncologists. We identify gaps in knowledge that may lead to overutilization and overestimation of benefit. Our findings provide insight into physician adherence to treatment guidelines and tangible quality improvement targets.

Table 1. Knowledge Assessment and Utilization Pattern Survey and Answers for Pembrolizumab in High-Risk Non Muscle Invasive Bladder Cancer (if applicable, correct answers marked with asterisk)

Question Item	N=50
Are you a medical oncologist or urologist?	
Medical Oncologist	17 (34%)
Urologist	33 (66%)
What is pembrolizumab?	
FGFR inhibitor	0 (0%)
Immune checkpoint inhibitor***	50 (100%)
Tyrosine Kinase inhibitor	0 (0%)
Is Pembrolizumab FDA approved for NMIBC?	
No	3 (6%)
Yes***	47 (94%)
Who is eligible for Pembrolizumab?	
BCG unresponsive NMIBC	9 (18%)
BCG unresponsive NMIBC with CIS with or without papillary tumors***	34 (68%)
BCG unresponsive NMIBC with or without CIS	7 (14%)
According to the FDA, what is the definition of BCG unresponsive NMIBC?	
Any recurrent High Grade Ta/T1 disease, with or without CIS, at any time point after completion of induction BCG	6 (12%)
Persistent or recurrent CIS, with or without recurrent Ta/T1 disease within 12 months of completing BCG therapy***	18 (36%)
Persistent or recurrent CIS, with or without recurrent Ta/T1 disease within 6 months of completing BCG therapy	21 (42%)
Recurrent High Grade Ta/T1 disease within 3 months of last BCG exposure	5 (10%)
Have you prescribed pembrolizumab for NMIBC?	
No	23 (46%)
No, but I have referred a patient to another provider for pembrolizumab	14 (28%)
Yes	13 (26%)
How many patients with NMIBC have you prescribed or referred for pembrolizumab?	
0	22 (44%)
1-5	23 (46%)
5-10	4 (8%)
>10	1 (2%)
How many prior courses of BCG did these patients undergo (induction and maintenance	
1-3	22 (44%)
4-6	2 (4%)
>6	4 (8%)
n/a	22 (44%)
Why were these patients candidates for pembrolizumab over radical cystectomy (check all that apply, therefore % add up to >100)	
Patient preference for organ sparing approach	29 (58%)
Medical Co-Morbidities	22 (44%)
Other	18 (36%)
Approval of pembrolizumab for NMIBC was based on the following results:	
In the KEYNOTE 057 trial, approximately 18% of patients overall demonstrated a complete response lasting at least 1 year***	23 (46%)
In the KEYNOTE 057 trial, approximately 32% of patients overall demonstrated a complete response lasting over 1 year	20 (40%)
In the KEYNOTE 057 trial, approximately 56% of patients overall demonstrated a complete response	6 (12%)
In the KEYNOTE 057 trial, approximately 9% of patients overall demonstrated a complete response	1 (2%)

MP4-07

Robotic-Assisted Laparoscopic Approach to Radical Cystectomy Mitigates Surgical Complications in Patients with Preoperative Malnutrition

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Introduction and Objective: Preoperative malnutrition raises clinical concern for complications following radical cystectomy (RC) in the treatment of muscle-invasive bladder cancer. A robotic, laparoscopic approach to RC, based on its reduced perioperative morbidity, could be preferable for patients with nutritional deficits. Prior studies have not explored the effect of a robotic approach on malnourished patients. This investigation will evaluate the associations of robot-assisted surgical approach with perioperative and 30-day postoperative complications after RC. It will also evaluate the effects of preoperative malnutrition and hypoalbuminemia on perioperative and 30-day postoperative complications after RC.

Methods: Retrospective review of ACS-NSQIP identified patients who underwent RC with postoperative diagnosis of bladder cancer and non-disseminated disease (2005-2018). Surgical approach was categorized as open vs. robotic / laparoscopic. Malnourishment was defined as either having low serum albumin (<3.5 g/dL), 10% 6-month preoperative weight loss, or BMI <18.5 kg/m2. Multivariable logistic regression and generalized linear models were used for categorical and continuous outcomes, respectively, to characterize the association between robotic approach and 30-day perioperative/. postoperative complications following RC compared to non-robotic operations.

Results: Malnourishment was associated with greater preoperative transfusions, systemic sepsis, peri-postoperative bleeding transfusion, 30-day mortality, postoperative C. difficile infection rate, and hospital length of stay. In malnourished patients: robotic approach was associated with lower adjusted odds of bleeding transfusions (aOR=0.51) and fewer adjusted days from operation to discharge (Beta[SE]= -5.2[1.1]) compared to open (all respective $p<0.05$).

Conclusions: Robotic-assisted approach to RC mitigated two major postoperative complications associated with malnutrition: bleeding transfusions and days from operation to discharge. Further improvements in perioperative pathways are needed to optimize the treatment of malnourished patients undergoing radical cystectomy, especially given the observed association with other high risk comorbidities. These findings highlight the fact that a robotic approach to RC may be preferable for patients with preoperative nutritional deficits.

MP4-08

Rising Rates of Newly Diagnosed Testicular Cancer: 27-Year Trends from a Statewide Registry

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Introduction and Objective: Testicular cancer (TC) remains one of the most curable genitourinary malignancies particularly when identified at an early stage. We reviewed >27-years of newly diagnosed TC across a statewide cancer registry to better define incidence, geographic distribution, and trends over time.

Methods: Using the Pennsylvania Cancer Registry from 1990 to 2017, county and statewide age-adjusted-TC incidence rates and stage distribution were determined. JoinPoint Trend Analysis Software and R-4.0.2 software modeled annual percent changes (APCs) in age-adjusted rates and mapped county-level incidence rates over five-year time intervals, respectively.

Results: A total of 9,933 cases were identified. Over two-thirds of patients were <40 years of age and 95% were white. Age-adjusted annual rates increased from 4.8 to 7.2 patients per 100,000 with an APC of 0.94 (95%CI 0.59-1.29, p<0.01) over the study interval. (Figure-1) Stage distribution using the SEER staging system included (68.1%)local, (19.1%)regional, (11.0%)distant, and (1.8%) unknown. Annual rates of local disease increased from 3.2 to 5.0 patients per 100,000 with an APC of 1.07 (95%CI- 0.67-1.46, p < 0.01). Distant disease rates remained stable ranging from 0.5 to 0.8 patients per 100,000 with an APC of 0.69 (95%CI- 0.02-1.40, p=0.06). Geospatial investigation of disease distribution noted "hot-spots" in the southeastern and southwestern parts of the state that persisted over time(Figure-2)

Conclusions: Rates of TC have risen by 50% in Pennsylvania over the past two decades. Fortunately, this trend is predominantly attributable to increases in local and regional disease. Geospatial mapping implicates "hot-spots" of TC incidence although investigation is necessary to delineate the underlying etiologies.

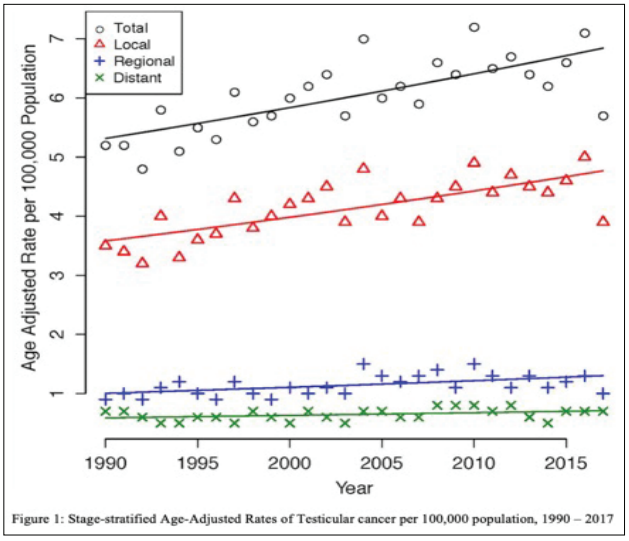

Figure 1: Stage-stratified Age-Adjusted Rates of Testicular cancer per 100,000 population, 1990 – 2017

MP4-09

Urological Management of Incarcerated Persons with Testicular Malignancy at a Single Institution

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Introduction and Objective: Incarcerated patients face many barriers to healthcare. There is sparse literature on Urologic care in this patient population specifically regarding genitourinary malignancies. Due to the rapid progression of testicular cancer, early diagnosis and treatment is essential. We hypothesize that barriers to care result in delays in diagnosis and treatment of testicular cancer in the inmate population. The aim of this study was to define the timeframe from evaluation to intervention for inmates presenting for testicular masses at our institution to identify and improve upon barriers to care in this vulnerable patient population.

Methods: A retrospective chart review was performed on incarcerated patients seen between 2014 and 2020 for germ cell testicular tumors (GCT). Data was collected on the time from suspicion of disease to time of radical orchiectomy, clinical stage at presentation, post-operative TNMS staging, and need for additional therapy.

Results: Ten patients were evaluated for GCT between 2014 and 2020 (White, N=7; Black, N=3). Mean patient age was 40.1 (25-62) years. Time from scrotal ultrasound to date of surgery was 49 ± 79.4 days. Two patients were lost to follow up and underwent radical orchiectomy 107 and 256 days after the initial ultrasound was performed. One of these patients required adjuvant radiation. Overall, 50% of patients underwent adjuvant treatment (RPLND, N=3; chemotherapy, N=4; radiation, N=2) and 30% underwent multi-modal treatments. Seven patients (70%) were diagnosed as stage 1, three patients (30%) were diagnosed as stage 2 post-orchiectomy.

Conclusions: Our results suggest that incarcerated patients may face significant delays in management of testicular cancer, which could result in the need for adjuvant therapy. Disease stage at orchiectomy was higher in our population than what is reported in the general literature. Further work is needed to identify and reduce barriers to care for Urological malignancies in the incarcerated patient population.

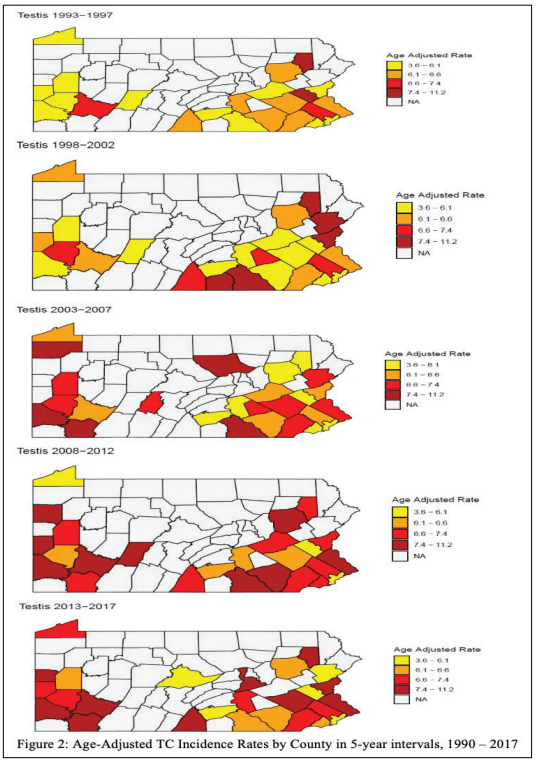

Figure 2: Age-Adjusted TC Incidence Rates by County in 5-year intervals, 1990 – 2017

MP4-10

Survival Outcomes in Late, Intermediate and Early Recurrence Renal Cell Carcinoma

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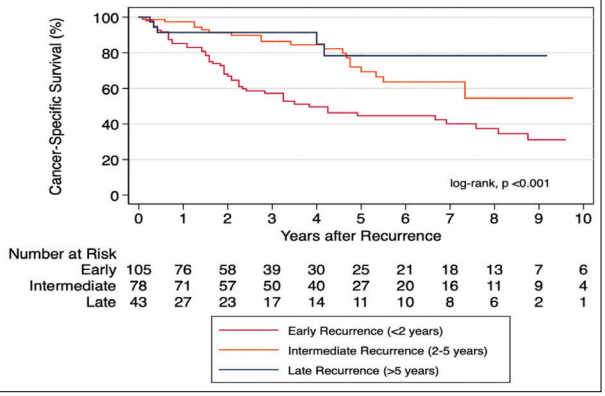
Introduction and Objective: Despite increasing kidney cancer detection, mortality from the disease remains steady. Unfortunately, the group of patients that die from kidney cancer largely consists of those have a recurrence after surgical intervention. This study aims to explore survival differences in patients with recurrent renal cell carcinoma based on various clinical metrics.

Methods: We identified 226 patients with a median age of 61.4 years who had recurrent RCC after nephrectomy. We examined sites of recurrence, time to recurrence, mortality, and chemotherapy they received. Multivariable logistic regression models were utilized to evaluate survival outcomes based on time to recurrence. Data was further stratified based on chemotherapy and sites of metastases.

Results: Univariable and multivariable analyses show that early recurrences (<2 years) are associated with significantly worse survival than those with intermediate or late recurrences. There is no significant difference in survival after recurrence based on tumor histology. Patients with multiple recurrence sites rather than a single site were at 2.32 times greater risk of death at 10 years. Patients with recurrence or new tumors in the ipsilateral or contralateral kidney demonstrated favorable long-term survival.

Conclusions: Early recurrence in RCC portends a poor prognosis for patients. Time to recurrence in RCC reflects a number of biological parameters including a higher likelihood of multiple, distant metastases. There is no survival difference among patients who recur within 2-5 years and those that recur after >5 years. Patients with recurrences in the ipsilateral or contralateral kidney have favorable survival outcomes, indicating the likely de novo etiology of these tumors.

Figure 1. Kaplan Meier survival curve based on time to recurrence after surgical intervention.



MP4-11

Surgical Delay After Biopsy and Risk of Upstaging for Clinical T1a Renal Cell Carcinoma

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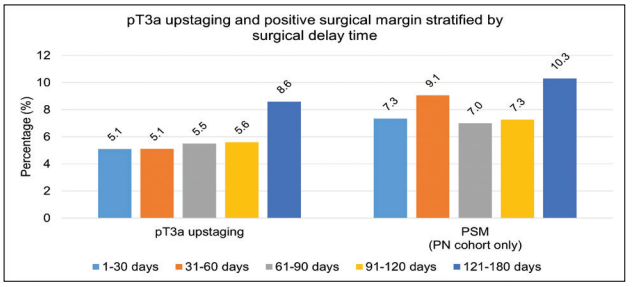
Introduction and Objective: Renal mass biopsy (RMB) has been increasingly used as the initial management of small renal masses (SRMs). However, little is known about whether surgical delay after the positive biopsy increases the risk of upstaging for small renal cell carcinomas (RCCs).

Methods: Patients with clinical T1aN0M0 RCCs (≤4cm) diagnosed between 2010 and 2016 who underwent RMB and then partial nephrectomy (PN) or radical nephrectomy (RN) were identified from National Cancer Database (NCDB). Surgical delay time (SDT) was defined as days between RMB and PN or RN. SDT was categorized into 1-30 days, 31-60 days, 61-90 days, 91-120 days, and 121-180 days. Upstaging to pT3a was the primary outcome. Positive surgical margin (PSM) was secondary outcome (PN cohort only).

Results: A total of 4,340 patients were included and 237 (5.5%) patients had pT3a upstaging. PSM rate was 8.2% in the PN cohort. pT3a upstaging and PSM rates stratified by SDT is shown in the Figure. Compared with SDT of 1-30 days, SDT of 31-60 days (odds ratio [OR]=1.04, P=0.833), 61-90 days (OR=1.17, P=0.481), and 91-120 days (OR=1.14, P=0.631) were not associated with increased odds of pT3a upstaging. Patients with SDT of 121-180 days had a higher risk of pT3a upstaging (OR=1.93, P=0.016). No significant associations between SDT and PSM were found.

Conclusions: In this NCDB study, increased SDT from RMB to definitive surgical resection of cT1aN0M0 RCCs was not associated with worse oncologic outcomes within 120 days after the RMB but patients with SDT > 120 days might have increased risk of upstaging. These findings have significant implications for patient counseling regarding active surveillance, RMB, and definitive surgical resection for SRMs.



MP4-12

Percutaneous Microwave Ablation vs. Partial Nephrectomy for Small Renal Masses: Cost-Effectiveness Analysis

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Introduction and Objective: To perform a cost-effectiveness analysis using a Markov model between percutaneous microwave ablation (MWA) and partial nephrectomy (PN) for treatment of small renal masses using both literature values and institutional outcome data.

Methods: We created a decision analytic Markov model depicting management of the small renal mass (percutaneous MWA vs robotic-assisted PN (RA-PN) incorporating costs, health utilities, and probabilities of complications and recurrence as model inputs from the literature. Modeling was performed using Treeage (2020.2.1). A willingness to pay (WTP) threshold of $75,000 was used.

Results: MWA was the preferred treatment modality. MWA dominated RA-PN, meaning it resulted in more QALYs at a lower cost. Model inputs are shown in Table 1 and the model decision tree is shown in Figure 1. Cost-effectiveness analysis revealed an Incremental Cost Effectiveness Ratio (ICER) of -$6,847 per QALY. The model revealed MWA had a mean cost of $12,921 and 12.5 QALYs. RA-PN had a mean cost of $21,477 and 11.2 QALYs. Sensitivity analysis was performed for all variables. Patient age of 39 years or younger resulted in RA-PN being favored over MWA. Relative preference of MWA was robust to sensitivity analysis of all other variables. Cost of RA-PN and patient age had the most dramatic impact on ICER. RA-PN was more cost-effective if local recurrence was managed with MWA rather than partial or radical nephrectomy.

Conclusions: MWA is preferred cost-effective for treatment of small renal masses when compared with RA-PN and accounting for complication and recurrence risk.

Table 1. Costs, Utilities, and Six-Month Probabilities for Base Case Analysis and Sensitivity Analysis

Variable	Value	Sensitivity Range	Source
Cost MWA	$6,374	(0.5-1.5) x BCE	Yeaman et al
Cost RA-PN	$20,064	(0.5-1.5) x BCE	Yeaman et al
Cost Local Recurrence	$3,488	(0.5-1.5) x BCE	Taplin et al*
Cost Metastatic Disease	$13,693	(0.5-1.5) x BCE	Taplin et al*
Cost Radical Nephrectomy	$12,357	(0.5-1.5) x BCE	Mouraviev et al*
Cost of Major Complication after MWA	$3,816	(0.5-1.5) x BCE	Yeaman et al
Cost of Major Complication after RA-PN	$13,802	(0.5-1.5) x BCE	Yeaman et al
Health Utility after MWA	0.96	0.82 - 1	Chang et al
Health Utility after RA-PN	0.88	0.77 - 1	Chang et al
Health Utility Multiplier MWA Complication	0.85	0.72 – 0.98	Chang et al
Health Utility Multiplier RA-PN Complication	0.85	0.72 – 0.98	Chang et al
Health Utility Local Recurrence	0.67	(0.5 x BCE) - 1	Pandharipande et al
Health Utility Metastatic Disease	0.25	(0.5 x BCE) - 1	Pandharipande et al
Probability of Major Complication after MWA	0.02	0.012 – 0.022	*Yong, Yu, Jones, Guan*
Probability of Major Complication after RA-PN	0.026	0.021 – 0.053	*Connor, Chehab, Castle, UVA institutional data*
Probability of Local Recurrence after MWA	0.0215	(0.5 – 2) x BCE	*Jones et al*
Probability of Local Recurrence after RA-PN	0.0034	0.00 – 0.0154	*Chang, Castle, Yu*
Probability of Metastases after Local Recurrence	0.0038	(0.5-1.5) x BCE	*Chang et al*
Probability of Death from Metastatic Disease	0.35	(0.5-1.5) x BCE	*Shao, Pandharipande*
Discount Rate (%)	3		

MWA- Microwave Ablation, RA-PN- Robotic-Assisted Partial Nephrectomy, BCE- Base Case Estimate, *- Value adjusted using consumer price index

MP4-13

Characterizing Tumor Thrombus Arising from Non Clear Cell Renal Cell Carcinoma

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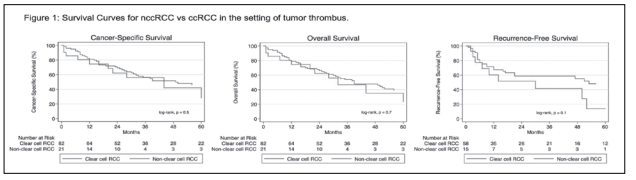
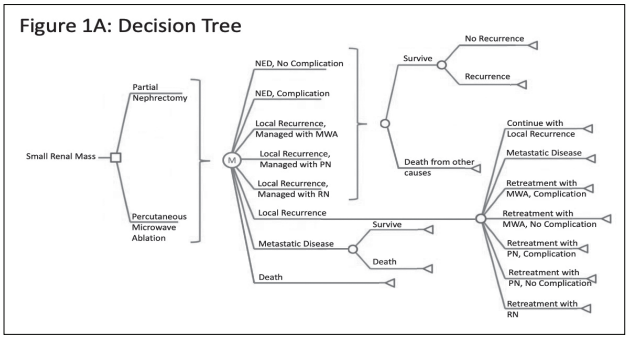
Introduction and Objective: Renal cell carcinoma (RCC) can exhibit a unique vascular tropism that enables local tumor thrombus extension into the renal vein and inferior vena cava (IVC). While most tumor thrombi forming RCCs are of clear cell (cc) histology, non-clear cell (ncc) subtypes can also exhibit this pattern. We sought to characterize clinicopathology and survival outcomes among patients with IVC tumor thrombus arising from ccRCC versus nccRCC.

Methods: A retrospective single institutional analysis was performed on all patients diagnosed with IVC tumor thrombus secondary to RCC (pT3b-c) from 1996-2021. Clinicopathology was compared by histology. Recurrence-free survival (RFS), overall survival (OS), and cancer-specific survival (CSS) were assessed using Kaplan-Meier methods and Cox regression.

Results: We identified 103 patients with IVC thrombus in the setting of RCC, including 82 ccRCC and 21 nccRCC (20.4%). There were no statistically significant differences in age, sex, body mass index, or smoking status between the ccRCC and nccRCC patients. Among patients with nccRCC, papillary was the most common histology (52.4%). Patients with nccRCC were more likely to have regional lymph node involvement (42.9% vs. 20.7%, p=0.04). No differences in surgical margin status, perioperative outcomes, or need for IVC resection or reconstruction were observed between cohorts. Median RFS for nccRCC vs. ccRCC was 30 vs. 53 months, respectively (p = 0.1). Median OS was 32 (nccRCC) vs. 39 (ccRCC) months (p=0.7), while median CSS was 44 (nccRCC) vs. 49 (ccRCC) months (p=0.5) (Figure 1).

Conclusions: Patients with nccRCC can develop IVC tumor thrombus. Those with IVC tumor thrombus extension from nccRCC or ccRCC exhibit similar perioperative and oncologic outcomes. Our results suggest that the surgical management for RCC patients with tumor thrombus need not differ by histology.





MP4-14

Renal Functional Outcomes after Robotic Assisted Laparoscopic Partial Nephrectomy for Single vs Multiple Renal Tumors

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Introduction and Objective: Although there is established literature demonstrating renal function preservation of robotic assisted laparoscopic partial nephrectomy (RAPN) for multiple tumors, there is little data comparing the outcomes of simultaneous RAPN for multiple tumors to RAPN for a single tumor. We compare outcomes of multiple concomitant partial nephrectomies to those of single partial nephrectomy.

Methods: We retrospectively reviewed our RAPN database from 2017 to 2020 to compare patient demographics and perioperative outcomes for patients who underwent single and multiple concomitant RAPN (Table 1). Patients undergoing repeat partial nephrectomy on the same kidney were excluded as were patients who had simultaneous surgery with RAPN.

Results: Twenty-two patients with multiple concomitant partial nephrectomies were compared to 84 patients with single partial nephrectomies. Mean number of tumors resected in the multiple group was 2.27. There was no significant difference between multiple and single RAPN groups in length of hospital stay, console time and estimated blood loss. The multiple and single RAPN groups had respective follow up from 13 and 42 patients with corresponding mean follow up as 10.3 months vs 8.01 months. The mean eGFR change was not significantly different. The multiple group had significantly higher warm ischemia time and post-operative complication rate. However, the rates of Clavien III or higher postoperative complications were not significantly different between groups. No patients required intraoperative blood transfusions.

Conclusions: Simultaneous RAPN for multiple tumors was associated with longer WIT and more frequent post-operative complications. However, there was no difference between RAPN for multiple tumors and single tumors in console time, high-grade complication rate, length of stay, and renal functional outcomes.

Patient and Operative Characteristics	Multiple Concomitant Partial Nephrectomy Group	Single Partial Nephrectomy Group	P-value
Age, years	59.9	59.6	
Gender			
Females (%)	27.3%	32.1%	
Males (%)	72.7%	67.9%	
Race			
Caucasian, N (%)	17 (77.3%)	61 (72.6%)	
African American, N (%)	5 (22.7%)	13 (15.5%)	
Hispanic, N(%)	0 (0%)	5 (5.9%)	
Asian, N (%)	0 (0%)	1 (1.2%)	
Other, N (%)	0 (0%)	4 (4.8%)	
Preoperative creatinine, mg/dL (SD)	1.08 (0.34)	1.05 (0.78)	p=0.77
Preoperative eGFR, mL/min/1.73 m^2, (SD)	76.1 (18.1)	84.1 (23.5)	P=0.09
RENAL score of most complex lesion (SD)	7.95 (2.32)	7.89 (2.06)	
Tumor size, cm (SD)	3.89 (2.51)	3.88 (1.77)	
Number of lesions removed (range)	2.27 (2-6)	1	
Console time, min (SD)	176.2 (58.0)	149.4 (46.3)	p=0.06
Warm ischemia time (SD)	31.9(9.86)	24.9 (9.06)	**p=0.02***
Estimated blood loss, mL (SD)	350.0 (369.4)	284.8 (292.3)	p=0.45
Hospital length of stay, days (SD)	2.18 (3.01)	1.52 (1.62)	p=0.32
Postoperative complication rate, N (%)	8 (36.4%)	12 (14.3%)	**p=0.02***
High-Grade Postoperative complication rate (Clavien grade ≧ 3)	1 (4.5%)	3 (3.6%)	p=0.83
Mean follow up time, months (range)	10.3 (5.5-25.0)	8.01 (2.0-14.5)	
Mean change in preoperative creatinine to follow up, mg/dL (SD)	+0.14 (0.09)	+0.07 (0.15)	p=0.18
Mean change in preoperative eGFR to follow up, mL/min/1.73 m^2, (SD)	-18.41 (12.65)	-6.17(15.55)	p=0.09

MP4-15

Distribution of New Renal Cell Carcinoma Cases Across a Large Statewide Cancer Registry

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Introduction and Objective: Prior studies using nationwide databases have implicated an increased incidence of renal cell carcinoma (RCC) over time. Granular data, however, may highlight potential geographic regions enriched with disease. Therefore, we review 27-years of RCC within Pennsylvania to better define incidence, geographic distribution, and statewide trends.

Methods: The Pennsylvania (PA) Cancer Registry was reviewed. R4.0.2 software was used to model average annual percent changes (AAPCs) in age-adjusted rates and map plots county-level distribution of stage and incidence of disease over 5-year intervals.

Results: 59,628 cases were recorded from 1990 to 2017. (86%) were >50years of age, (61%)were males and (89%) were white. Stage distribution using SEER system: (64%) local, (17%) regional and (16%) distant. Over the study interval, age-adjusted rates of all cases increased from 9.9 to 18.0 patients per 100,000 with an AAPC of 2.3 (95%CI= (1.74,2.90), p<0.01) (Figure-1). Age-adjusted rates of local disease increased from 5.4 to 12.7 patients per 100,000 with an AAPC of 3.2 (95%CI=(2.93, 3.53), p <0.01). Age-adjusted rates of regional disease also increased from 1.9 to 2.9 patients per 100,000 with an AAPC of 1.0 (95%CI= (0.29,1.71), p=0.01). Younger patients (age <50 years) had a greater rate of increase than older (age>50 years) counterparts (APC: 3.8 vs. 2.0 ,respectively (p<0.05). Geospatial investigation noted certain geographic concentrations of greater disease incidence (Figure-2).

Conclusions: The incidence of RCC has increased over the past 27-years, and this change is predominantly enriched with diagnosis of localized disease. Nonetheless, one-third of cases are regional or metastatic at presentation and rates of increase were most pronounced in younger patients. Geospatial investigation implicates growing "hot-spots" of RCC in certain portions of PA.

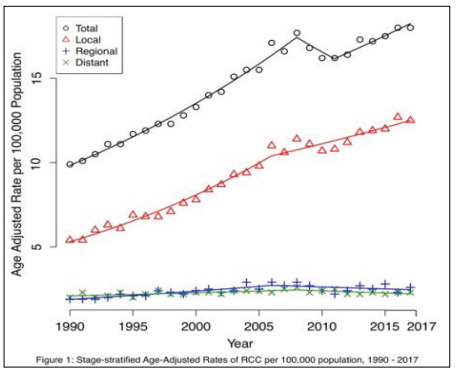

Figure 1: Stage-stratified Age-Adjusted Rates of RCC per 100,000 population, 1990 - 2017

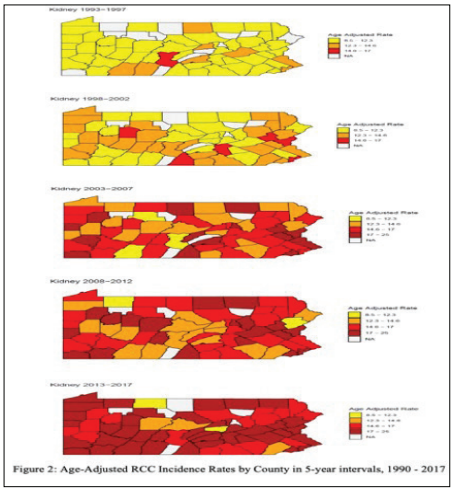
Figure 2: Age-Adjusted RCC Incidence Rates by County in 5-year intervals, 1990 - 2017

MP5-01

The Effect of 3D Printed Models on Surgical Planning and Outcomes for Partial Nephrectomies

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Introduction and Objective: Prior research demonstrates complex and expensive ($250-1000) patient-specific 3D partial nephrectomies models changed the planned surgical approach and improved surgeon confidence. Our study aimed to use simpler and less expensive 3D models to support surgical planning and operative management.

Methods: Cost-effective 3D printed models ($35-50) of the affected kidney, mass, and vasculature were created using preoperative imaging of 40 patients presenting for robotic partial nephrectomies at Thomas Jefferson University Hospital (TJUH) from 6/1/2020 - 5/31/2021. Six Urologic surgeons filled out three surveys assessing their surgical plan and confidence: 1) before seeing the model, 2) after seeing the model and before surgery, and 3) after surgery. 3D modeling patients were crossmatched by Nephrometry score, demographics, operative technique, and affected kidney with patients without 3D modeling who had robotic partial nephrectomies at TJUH between 2018–2019.

Results: Surgeons filled out both pre-operative surveys for 36 cases. Surgeon confidence significantly increased after seeing the 3D model ($p = 0.016$). On post-operative surveys, attendings rated the models 7.9 out of 10 in their helpfulness to anatomical comprehension. Surgeons changed their surgical plan eight times after seeing the 3D model: five times changing approach, and three times clamping selectivity. Patients with 3D modeling had a statistically higher Nephrometry score (8) compared to patients without 3D modeling (6.7) ($p=0.03$). Even with more complex masses, patients with 3D modeling had similar operative lengths, shorter length of stay ($p=0.013$), less intraoperative blood loss, less creatinine change, fewer adverse events, and a higher rate of selective clamping.

Conclusions: Cost-effective 3D models are helpful tools for surgeons to understand anatomical relationships and reduce complete vascular clamping that may be difficult with imaging alone. Continued exploration is important on the benefits of 3D printing to surgeon experience to assess if these simple 3D printed models should become standard of care for partial nephrectomies.

MP5-02

Using Resident Evaluators Provides Less Anxiety When Implementing Novel Technical Skills Assessments During Residency Interviews

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Introduction and Objective: In 2018, we investigated the integration of critical thinking and technical skills into the traditional residency interview process and found it feasible and provided insight into a candidate's qualifications. Here, we explore the utility of integrating robotic simulation as an assessment metric and the use of residents as evaluators.

Methods: Open suturing--OS and da Vinci ® Robotic Ring Walk 2 simulation—RS stations were incorporated into the traditional interview process. Likert scale (1-5) was used to score the candidate's performance in each skill station and in the traditional interview (TI). The same 2 residents served as evaluators for the skill stations. Scores were analyzed with paired t-tests and anonymous candidate questionnaire responses, assessing their receptiveness, were analyzed using Wilcoxon rank sum and chi-square tests.

Results: 59 candidates were interviewed. Median TI score of 4.3 (IQR 4.0, 4.6) was significantly higher than the median score for OS of 3.5 (IQR 3.0, 4.0) ($p<0.001$) and RS of 1.2 (0.05, 2.9) ($p<0.001$). For the majority of candidates, the median TI score was greater than their performance on the OS--47 (80%) as well as in the RS--51 (86%). Forty-eight (81%) of candidates scored better on OS than on RS. Forty-five (76%) candidates completed the questionnaire. Of these, 22 (49%), felt that the technical skills assessment gave them the opportunity to demonstrate capabilities not normally assessed. Nineteen (42%) of candidates felt the technical skills stations provoked more anxiety than other portion of the interview, but thirty-eight (84%) candidates thought it was less stressful having residents as evaluators.

Conclusions: Using RS was a novel metric and provided better score discrimination amongst candidates, however it was perceived as being more technically challenging than OS. Utilization of residents as evaluators provided less anxiety, which is important when integrating such novel assessments into the interview process

MP5-03

Nephrolithiasis Nutritional Counseling: Comparison of Patient Satisfaction between Face-to-Face and Telehealth Modalities

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Introduction and Objective: Fostered by improved and more readily-available technologies, and further propelled into the mainstream during the COVID-19 pandemic, telephone and virtual video appointments have been increasingly utilized to provide medical care. The increased ease and convenience of telehealth appointments can expand access to patients who experience time or transportation barriers to in-person appointments. We sought to examine and compare patient satisfaction following in-person or telehealth appointments for nephrolithiasis nutritional counseling.

Methods: Ninety-six patients with a previous diagnosis of nephrolithiasis underwent an initial in-person nutrition consultation, between May 2019-February 2021. Patients were then randomly assigned in-person or virtual telehealth nutrition follow-up, and surveyed on their experiences. Patients with virtual follow-up completed the Telemedicine Satisfaction Questionnaire (TSQ), on a 5-point Likert scale, while patients with in-person follow-up completed an 8-question modified TSQ (technology-related questions were removed).

Results: Of the 96 patients who provided survey responses, 46 participated in virtual follow-up appointments, while 50 patients had in-person visits. Greater than 90% of those who participated in virtual visits "agreed" or "strongly agreed" that they were satisfied with the quality of service provided through telemedicine. Over 82% of patients reported an intent to use telemedicine services again. A majority of patients also reported better access to healthcare services, comfort with the technology and in communication with their provider, and time saved. When responses following in-person and virtual visit surveys were compared, no statistically significant difference was found (Table 1).

Conclusions: Telemedicine is an adequate method of providing health care services without compromising patient satisfaction.

Table 1: Comparison of Responses Between In-Person and Virtual-Visit Survey's

	Telemedicine, N (%)	Face-To-Face N (%)	p-value
N	46	50	
Age, Mean ± SD	55.5 ± 14.6	59.6 ± 13.4	0.16
Gender			0.016
Female	15 (32.61)	29 (58)	
Male	30 (65.22)	19 (38)	
Prefer Not to Answer	1 (2.17)	2 (4)	
Ethnicity			0.856
Caucasian	39 (84.78)	42 (84)	
African American	3 (6.52)	3 (6)	
Other	4 (8.7)	5 (10)	
I can easily talk to my nutrition provider*	45 (97.83)	48 (96)	1.000
I can hear my nutrition provider clearly*	45 (97.83)	48 (96)	1.000
My nutrition provider is able to understand my healthcare condition*	45 (97.83)	48 (96)	1.000
I feel comfortable communicating with my nutrition provider*	43 (93.48)	47 (94)	1.000
I receive adequate attention from my nutrition provider*	44 (95.65)	48 (96)	1.000
I can see my nutrition provider as if we met in person*	45 (97.83)	N/A	
I do not need assistance while using the system*	41 (89.13)	N/A	
I think the healthcare provided through telemedicine is consistent*	42 (91.3)	N/A	
I obtain better access to healthcare services by use of telemedicine*	31 (67.39)	N/A	
Telemedicine saves me time traveling to hospital or a specialist clinic*	37 (80.43)	N/A	
Telemedicine meets my healthcare needs*	41 (89.13)	N/A	
I find telemedicine an acceptable way to receive healthcare services*	39 (84.78)	N/A	
I will use telemedicine services again*	38 (82.61)	N/A	
Overall, I am satisfied with the quality of service being provided by telemedicine*	43 (93.48)	N/A	

* Corresponding N (%) represent responses of Agree/Strongly Agree

MP5-04

The Utilization of Perfused Cadaver Simulation in Urologic Training

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Introduction and Objective: Today's residents are tasked with learning a broader skillset than ever before. This had led to concern that residents are not prepared for independent practice after residency. The objective of this study was to determine if participating in a surgical training session using perfused fresh human cadavers (PFHC) had a positive effect on urology residents' confidence in performing open and endoscopic procedures.

Methods: Urology residents at our institution participated in a surgical training session in the West Virginia University Fresh Tissue Training Program, which utilized fresh, never frozen cadavers with vascular perfusion. The session consisted of performing different urologic procedures (open and endoscopic) on the PFHCs. Residents were given a survey to rate their confidence in different urologic procedures before, after, and 6 months after the session. Each procedure on the survey had 3-6 questions associated with it, with scores ranging from 0 (no confidence) to 4 (great confidence). Scores for each procedure before and after the session were compared.

Results: Six residents participated in the session. There was an increase in the score for every procedure performed after the session. Scores at 6 month follow up remained higher than the pre-session scores. Residents believed the session was a true simulation of the conditions of live surgery and would increase their confident in handling future intra-operative consults.

Conclusions: PFHCs offer an excellent opportunity to teach a wide variety of urologic procedures to residents. Incorporation of PFHCs may be very useful in urologic training, and further studies on its use are warranted.

	Survey Scores (total possible points)																	
	Exploratory Laparotomy (16)			Partial/Radical Nephrectomy (16)			Ureteral/Bladder Injury Repair (16)			RPLND (16)			Groin Dissection (12)			Orchiectomy/Orchopexy (20)		
	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after
PGY-5	13	16	16	12	16	16	15	16	16	2	14	11	8	12	12	19	20	20
PGY-4	5	9	11	4	12	12	9	15	16	1	11	10	5	12	12	20	20	20
PGY-3	1	3	5	0	2	3	1	4	5	0	2	2	2	3	4	13	17	20
PGY-2	1	3	2	0	6	4	1	6	5	1	2	2	3	6	5	10	12	18
PGY-2	1	7	5	0	7	4	2	7	4	0	1	0	1	6	6	10	15	16
PGY-1	0	2	1	0	2	1	0	2	1	0	1	0	0	3	3	0	9	5

Table 1: Scores before, immediately following, and 6 months after session for open procedures

	Survey Scores (total possible points)											
	Difficult Foley Placement			TURBT			TURP			URS		
	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after	Before	After	6 months after
PGY-5	20	20	20	16	16	16	24	24	24	20	20	20
PGY-4	20	20	20	16	16	16	22	24	24	20	20	20
PGY-3	19	20	20	13	14	16	18	24	24	20	20	20
PGY-2	13	18	19	1	8	3	0	8	10	9	15	14
PGY-2	15	20	18	2	12	11	1	18	17	16	20	20
PGY-1	10	13	14	1	5	2	1	5	3	2	6	5

Table 2: Scores before, immediately following, and 6 months after session for endoscopic procedures

MP5-05

Wellness Programming in Urology Residency Programs

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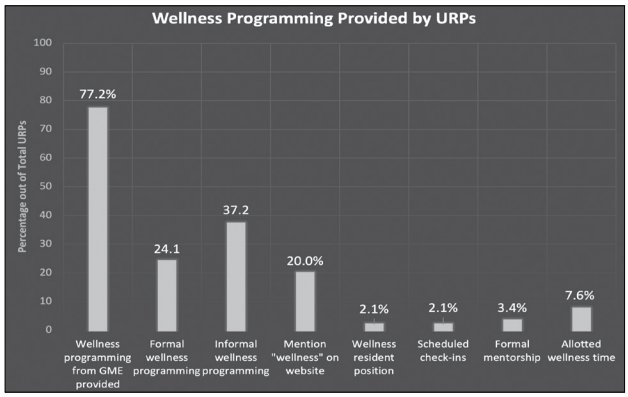
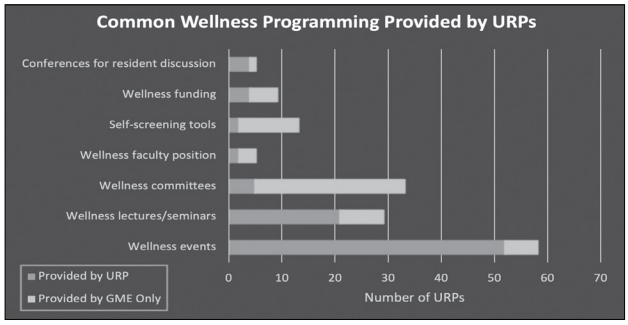
Introduction and Objective: Physician burnout is a growing concern. Rates of burnout in urology are high relative to other specialties, with higher rates among residents. Wellness programs have been shown to decrease burnout and have been implemented in many specialties. This study aimed to assess the prevalence of wellness programming in urology residency programs (URPs).

Methods: Websites for all 145 ACGME-accredited URPs in the United States were assessed for mention of "wellness" or "well-being." Program directors and/or coordinators for each residency program were e-mailed asking about the presence of formal wellness programming, informal wellness activities, and wellness programming offered by the institution or graduate medical education (GME). A description of what wellness programming was offered was also requested.

Results: Assessment of program websites found that 29 programs (20%) mentioned "wellness" or "well-being." Representatives from 58 URPs (40%) responded to the survey, with programs indicating formal or informal wellness programming (Figure 1). Compilation of data from e-mail responses and information from program websites revealed that 112 URPs (77.2%) offer residents wellness resources from the institution or GME, 58 (40%) provide wellness events for residents, and 29 (20%) provide wellness lectures to residents (Figure 1). Other metrics noted included presence of wellness committees, scheduled check-ins from program directors/faculty, and conferences for open resident discussion of issues (Figure 2).

Conclusions: Given that wellness programming is a requirement for ACGME, it is not surprising that most programs have institutional wellness programming available. Wellness programing from individual URPs appears limited.





MP5-06

Difficult Foley? A Look into Difficult Foley Consults

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Introduction and Objective: While urethral catheters are usually placed without issue, many factors can make placement challenging. We are aiming to further understand reasons for difficulty and the role of urology consultation.

Methods: This is a prospective study that was conducted at a tertiary care hospital from April 2018 through March 2020. We prospectively collected data on multiple parameters including patient demographics, reason for consultation determined by consulting service, consulting service, whether the patient was ICU status, and the level of, and reason for difficulty determined by the urology team. Patients were divided into two groups according to level of difficulty.

Results: Most consultations were male patients (88.1%). The most common reason for consultation per consulting team was inability to advance at a level of the prostate (49.5%). Advanced interventions for foley placement which were investigated included guidewire, dilation, and cystoscopy- of these the most commonly utilized was guidewire, used in 36.6% of cases. The most common reason for difficult placement, as determined by the urologist, was inadequate technique (26.7%). The level of difficulty was determined by set criteria of interventions employed by the urologist- the most commonly ascribed was level 3 (23.8%). Most common reason for consultation in the non-difficult group was resistance at the prostate, while the most common reason for difficulty was inadequate technique.

Conclusions: Our study provides an understanding of reasons for consultations regarding foley placement and different levels and reasons for difficulty, which can help optimize and improve the process of foley placement in the hospital setting.

Age, *mean (SD)*	68.1 (14.6)
Gender	
Male	89 (88.1%)
Female	12 (11.9%)
Weight, *mean (SD)*	92.9 (32)
BMI *mean (SD)*	30.6 (9.9)
Reason for consult	
1. Unable to advance at prostate level	50 (49.5%)
2. Edema\Swelling	14 (13.9%)
3. Hematuria\Clots	5 (5%)
4. Phimosis	4 (4%)
5. Hx of prostate or urethral surgery or radiation\BNC	7 (6.9%)
6. Meatal stenosis	6 (5.9%)
7. Difficult exposure\abnormal anatomy	7 (6.9%)
8. Traumatic foley	(3 (3%)
9. False passage	1 (1%)
10. Vaginal atrophy\Introital stenosis	4 (4%)
Requesting Service	
1. ED	18 (17.8%)
2. Medical Service	32 (31.7%)
3. Surgical Service	23 (22.8%)
4. ICU	28 (27.7%)
Cystoscopy Required	4 (4%)
Dilation Required	17 (16.8%)
Guidewire Required	37 (36.6%)
Reason For Difficulty	
1. Edema/ Swelling	11 (10.9%)
2. Inadequate Technique	27 (26.7%)
3. Phimosis	5 (5%)
4. Prostatic Enlargement	16 (15.8%)
5. Meatal Stenosis	4 (4%)
6. False Passage	6 (5.9%)
7. Urethral Stricture	17 (16.8%)
8. Buried Penis	3 (3%)
9. Retropubic female urethra	5 (5%)
10. Difficult exposure of female urethra secondary to obesity	2 (2%)
11. Penile implant problem	2 (2%)
12. Obstruction by clots/ debris	2 (2%)
13. Patient request	1 (1%)
Level Of Difficulty	
(1) Foley from the Kit Placed (16 or 18 Fr Latex)	21 (20.8%)
(2) Different Catheter Placed (Coude, different size...etc.), no intervention	19 (18.8%)
(3) Difficult Exposure (Edema, Phimosis, Retropubic meatus in female)	24 (23.8%)
(4) Guidewire required (Council tip or modified Council catheter)	17 (16.8%)
(5) Dilation required (urethral or meatal dilation)	16 (15.8%)
(6) Cystoscopy required (bedside)	4 (4%)

	Non-difficult (Level 1-2) *N.* = 40 (39.6%)	Difficult (Level 1-2) *N.* = 61 (60.4%)	P value
Age, *mean (SD)*	65.9 (16.3)	69.5 (13.2)	0.217
Weight (kg), *mean (SD)*	89.5 (30.8)	95.5 (32.7)	0.359
BMI, *mean (SD)*	29.6 (9.2)	31.3 (10.4)	0.384
Requesting service			0.838
• ED	6 (15%)	12 (19.7%)	
• Medical service	14 (35%)	18 (29.5%)	
• Surgical service	10 (25%)	13 (21.3%)	
• ICU	10 (25%)	18 (29.5%)	
Reason for consult per requesting team			0.001
• Phimosis	1 (2.5%)	3 (4.9%)	
• Meatal Stenosis	0	6 (9.8%)	
• Difficult exposure/abnormal anatomy	2 (5%)	5 (8.2%)	
• Edema/swelling	2 (5%)	12 (19.7%)	
• Resistance at prostate (BPH)	31 (77.5%)	19 (31.1%)	
• Hx of urethral or prostate surgery or radiation	2 (5%)	2 (8.2%)	
• Vaginal atrophy/introital stenosis	1 (2.5%)	3 (4.9%)	
• False passage	0	1 (1.6%)	
• Traumatic foley	0	3 (4.9%)	
• Hematuria	1 (2.5%)	4 (6.6%)	
Reason for difficulty per urology			0.000
• Edema\swelling	1 (2.5%)	10 (16.4)	
• Buried penis/ obesity	0	3 (4.9%)	
• Phimosis	0	5 (8.2%)	
• Meatal stenosis	0	4 (6.6%)	
• False passage	0	6 (9.8%)	
• Urethral stricture	4 (10%)	13 (21.3%)	
• Prostatic enlargement	5 (12.5%)	11 (18%)	
• Penile implant problems	1 (2.5%)	1 (1.6%)	
• Obstruction by clots\debris	1 (2.5%)	1 (1.6%)	
• Retropubic female urethra	1	4 (6.6%)	
• Difficult exposure of female urethra due to obesity	0	2 (3.3%)	
• Inadequate technique	26 (65%)	1 (1.6%)	
• Patient request	1 (2.5%)	0	

MP5-07

The Outcome of Utilizing Robotic Surgical System to Treat Ureteroenteric Anastomotic Stricture

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Introduction and Objective: Ureteroenteric anastomotic strictures develop in up to 20% of patients after urinary diversion. The surgical revision of the anastomosis, though yields the best outcome, is challenging and traditionally required a large midline incision, due to the adhesions and scarring. We report on the outcome of robotic reimplantation to ileal conduit.

Methods: Nine patients presented to our service with stricture of the ureteroenteric anastomosis after urinary diversion. Two patients presented with ureteral anastomotic structure to ileal neobladder. The remaining seven presented with ureteroenteric structure at the ileal conduit. Of the nine, two patients had bilateral ureteral anastomotic stricture, two right-sided strictures of a solitary kidney, and five had isolated left ureteral anastomotic stricture.

Results: The average patient's age at presentation was 72 years (range 59-82) with 2 females (22%). All cases were done robotically with no conversion. The average length of the procedures was 201 min (90-460). An average blood loss of 183 ml (50-800). The average hospital length of stay was 4.2 days (1-14). Two patients developed transient ileus that resolved with no intervention. One patient developed a DVT (11%) after surgery, and another had an AKI (11%). All the anastomoses were patent after follow-up of an average of 16 months (6-32). None of the patients progressed to chronic renal failure or required dialysis.

Conclusions: Robotic ureteral anastomotic repair is a viable option for ureterointestinal anastomotic structure. The robotic approach minimizes the invasiveness of the procedure with favorable outcomes. Longer follow-up is needed to ensure the reliability of the technique.

Patient	Age	Gender	Side	Diversion	Op Time	Hospital stay	EBL	Complication
1	69	Male	Left	Conduit	180	3	150	
2	82	Female	Left	Conduit	240	4	100	
3	78	Male	Bilateral	Conduit	460	7	800	AKI
4	72	Male	Left	Conduit	130	3	75	
5	67	Male	Left	Conduit	170	2	50	
6	70	Male	Left	Orthotopic	140	14	300	ileus
7	80	Female	Right	Conduit	120	2	100	DVT
8	59	Male	Bilateral	Orthotopic	280	2	50	Ileus
9	74	Male	Right	Conduit	90	1	25	

MP5-08

Ureteral Stricture Prevention Through a Multi-modal Intervention for Robotic Intracorporeal Ileal Conduit Urinary Diversion

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Introduction and Objective: An important complication of radical cystectomy and urinary diversion is benign uretero-enteric anastomosis (UEA) stricture, with reported rates up to 15%. In this study, we reported the impact on UEA stricture formation from the introduction of a multi-modal surgical technique combining the use of firefly visualization of ureteral blood flow, a wound-healing promoting wrap of decellularized umbilical tissue, and a retro-sigmoidal ileal conduit reconstruction to alleviate left ureteral tension.

Methods: We retrospectively reviewed patients with bladder cancer undergoing RARC and intracorporeal ileal conduit in our center by the same urologist (MMS) from December 2015 to June 2020. Patients were divided into two groups based on the ileal conduit reconstruction (multi-modal retro-sigmoidal conduit or standard conduit with optional use of firefly/wound-healing promoting wrap). Patients demographics, postoperative complications, and UEA status were collected and compared between groups.

Results: 52 patients received RARC and intracorporeal ileal conduit and 45 had been followed up, with 25 in the standard group and 20 in the retro-sigmoidal group. Most variables were comparable between groups. With a median follow-up time of 19 months (IQR 6-36) in standard group vs 8 months (IQR 4.75-11.5) in retro-sigmoidal group, the global UEA stricture rates were 34.8% vs 0% (p=0.009, Figure 1). Among the 10 benign UEA strictures (per ureter), the median time of stricture formation was 6 months (IQR 3-8.5). The postoperative 30-day, 90-day complication rate, and 30-day readmission rate were comparable between groups.

Conclusions: The use of this multi-modal retro-sigmoidal ileal conduit technique in RARC may reduce the UEA stricture rate. Further studies with larger cohorts are needed to validate this finding as well as help elucidate if some component of the multi-modal intervention is most important.

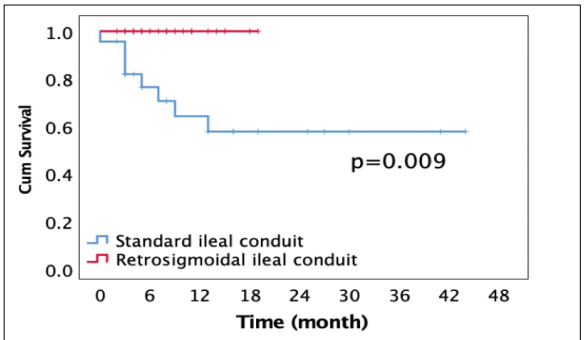

Figure 1. KM curve shows the difference in UEA stricture rates between multi-modal retrosigmoidal ileal conduit group and standard ileal conduit group.

MP5-09

HOLEP Perioperative Outcomes Using Three Different Holmium Laser Technologies in a Community Hospital Setting

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Introduction and Objective: Transurethral resection of the prostate is the gold standard treatment of Benign Prostatic Hyperplasia. Holmium laser enucleation of the prostate (HoLEP) has demonstrated superior perioperative and long-term outcomes. Recent advances in laser technology have improved treatment times, hemostasis, and length of stay. We examined the perioperative outcomes of three generations of lasers: Traditional 100W HoLEP, Moses Pulse 120H (Moses 120), and Moses Enucleation of the Prostate (MoLEP).

Methods: HoLEP was performed by a single surgeon in 140 patients using the Traditional 100W HoLEP, Moses 120, and MoLEP with a modified two-lobe technique. Patient characteristics, pre-, peri-, and post-operative data were recorded in a prospective database.

Results: Patient characteristics and preoperative values were similar between cohorts (Table 1). A decreased total length of surgery (mean = 64 min, p = 0.03), resection time (mean = 43 min, p = 0.019), length of stay (mean = 10 hours), and an increased same-day discharge (mean = 88%) was seen in the MoLEP cohort. Thirty day readmission was highest in the Traditional 100W HoLEP cohort at 4, with 2 requiring reoperation for genitourinary cause. Readmissions for Moses 120 and MoLEP were 1 and 2 respectively, with 1 from each necessitating reoperation. All returns to operation were due to hematuria.

Conclusions: MoLEP demonstrated superior outcomes, including shorter operative times and a higher percentage of patients discharged same-day compared to Traditional 100W HoLEP and Moses 120. Additionally, readmissions were decreased in Moses 120 and MoLEP when compared with Traditional 100W HoLEP. This is prospective evidence HoLEP using MoLEP improves outcomes over other holmium laser technology.

Table 1: Demographic information and operative outcomes for patients undergoing treatment with HoLEP, Moses 120, and MoLEP.

	HoLEP (n=50)	Moses 120 (n=40)	MoLEP (n=50)
Patient Characteristics			
Age (y, mean)	68	70	68
Prostate Volume (g, mean)	131.4	128.0	107.48
Preoperative Values			
IPSS Score (mean)	18	17	17
Qmax (mL, mean))	8.77	7.47	8.13
PVR (mL, mean)	334.1	318.2	260.1
Perioperative Values			
Total Length of Surgery (min, mean)	78	77	64
Resection Time (min)	54	50	43
Prostate Volume Removed (g)	31.1	62.9	57.8
LOS (hours)	14	13	10
Postoperative Values			
Same Day Discharges (%)	78.0	72.5	88.0
30-day Readmission (n)	4 (2)	1	2

y=years; g=grams; IPSS=International Prostate Symptoms Score; mL=milliliters; PVR=Post-Void Residual; min= minutes

MP5-10

Urology Practice Scores in the Era of the Merit-based Incentive Payment System

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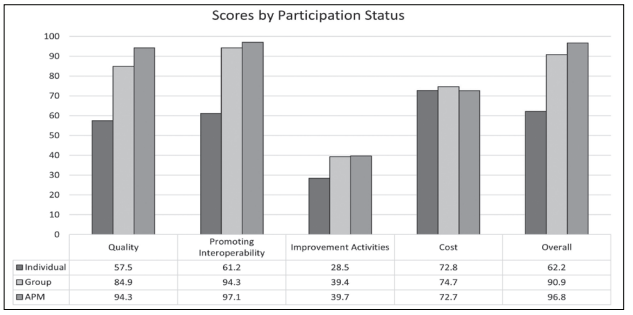
Introduction and Objective: In the era of value-based payment, there has been a shift toward integration of physician practices into health systems with multispecialty entities. It is unknown how urologic practices have been impacted by the recent implementation of the Merit-based Incentive Payment System (MIPS). We describe the MIPS performance scores of urologists and investigate the evolution of practice patterns over time.

Methods: Urologists were identified in the 2018 MIPS performance score database. Each clinician was classified by participation status, which is defined as enrollment in MIPS as an individual practitioner, group practice, or alternative payment model (APM). The overall MIPS score is comprised of four categories with a maximum score of 100 points: quality, promoting interoperability (PI), improvement activities (IA), and cost. Comparative statistics were performed using Tukey's honest significance test and chi-square analysis.

Results: A total of 9055 urologists were included with the following average scores: quality 82.5, PI 88.9, IA 37.3, cost 74.4, and overall 86.9. The figure shows each individual score stratified by participation status. There were statistically significant differences among the three groups (P<0.001) in each category except for cost. Group practices scored higher than individual practitioners; APMs often scored even higher. Individual practices were more common among urologists who graduated medical school between 1950 and 1989, whereas group practices were more common among those graduating 2010 and beyond; APMs were most common in the 1990s and 2000s (P<0.001).

Conclusions: Urologists who participated as a group practice or APM appear to have transitioned to the MIPS criteria with greater success than individual practitioners. Urology practices have evolved over time, likely as a response to meet increasingly stringent standards of care.



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Postoperative Values			
Same Day Discharges (%)	78.0	72.5	88.0
30-day Readmission (n)	4 (2)	1	2

y=years; g=grams; IPSS=International Prostate Symptoms Score; mL=milliliters; PVR=Post-Void Residual; min= minutes

MP5-11

Telehealth in Urology 1-year into the Pandemic: Sustained Change or a Flash in the Dark

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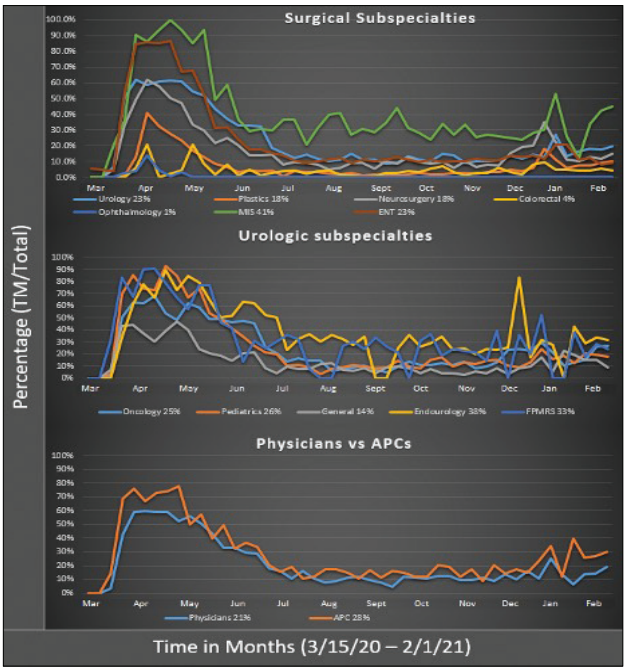
Introduction and Objective: Telemedicine (TM) was historically underutilized within surgical specialties in part to limited billability and subsequent reimbursement. During the COVID-19 pandemic, in-person exposure risk alongside evolving reimbursement models incentivized adoption of TM. We review TM experience 1-year into the pandemic within a large rural health system to determine: 1) adoption and sustained use across surgical domains; 2) use within Urologic subspecialties; and 3) variances by provider type (MD vs. APP)

Methods: Data on TM versus in-person visits to surgical specialties were prospectively collected from March 2020 to February 2021. Comparison across (1) surgical specialties (Urologic, Plastics, Neurosurgery, Colorectal, Minimally Invasive Surgery, ENT, and Ophthalmology); (2) urologic subspecialties (Oncology, Pediatrics, General, Endourology, and FPMRS); and (3) urologic provider type was performed using the chi-square test.

Results: Overall 23679 health visits across surgical services were recorded. Of these, 19381 (82%) were on-site visits and 4298 (18%) were TM. Greatest TM use occurred during the first 3 months of the pandemic averaging 49.2% versus 15.7% within the past 3 months. Urology demonstrated the second greatest use of TM (23%) although rates over the past 6 months have averaged (13.7%, range 8.5% - 27%). Variations were noted in subspecialties of Urology, with the highest in Endourology (38%) compared to general urology (14%). APP utilization of TM was higher compared to physicians (28% vs. 21%, p<0.001).

Conclusions: Telemedicine was used in ~20% of visits during the first year of this pandemic although utilization has dropped over the past 6 months to under 14%. Amongst surgical specialties, Urology, specifically Endourology, was a higher utilizer of TM. Understanding barriers to TM deployment including technology platform, patient preference, and geography may increase utilization.



MP5-12

The Delayed and Diminished Nephrogram on Computed Tomography: Measurement and Association with Impaired Renal Function

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Introduction and Objective: Unilateral delayed/diminished nephrogram contrast-enhanced computed tomography (CT) is qualitatively known to be associated with ureteral obstruction. We sought to quantitatively describe these phenomena using methods applied in clinical practice and to determine whether they might be independently associated with loss of renal function.

Methods: We retrospectively reviewed images from 76 patients from 1/2010 to 1/2021 who had a contrast-enhanced CT scan within 30 days of technetium-99m mercaptoacetyltriglycine diuretic renal scintigraphy (DRS) which showed one kidney to have normal (T1/2 <10 min on DRS) and the other to have abnormal (T1/2 >10 min) drainage on DRS. The Hounsfield units (HU) of the renal cortex and medulla were measured separately using circular regions of interest. Renal cortical volume was estimated using simple linear measurements which have been previously described and found to be highly correlated with renal function. Differential renal attenuation (DRA) was measured as absolute differences in HU between the subject and normal kidney. Delayed nephrogram was defined using the difference in corticomedullary differentiation (DCMD) between units.

Results: Cortical DRA > 15, medullary DRA > 20, and DCMD >20 showed specificity of 100%, 100%, and 97% respectively for abnormal drainage on DRS. 30-50% of patients with prolonged drainage on DRS had no appreciable delayed or diminished nephrogram. Kidneys with delayed or diminished nephrograms functioned less well per unit of renal volume (p = <0.001 for all measures of delay/diminishment).

Conclusions: Delayed and diminished nephrograms specific but not sensitive for renal obstruction on MAG3. These signs are independently associated with poorer renal functioning, suggesting that they may identify a subset of patients who are experiencing ongoing high collecting system pressure and are at increased risk of further renal functional loss.

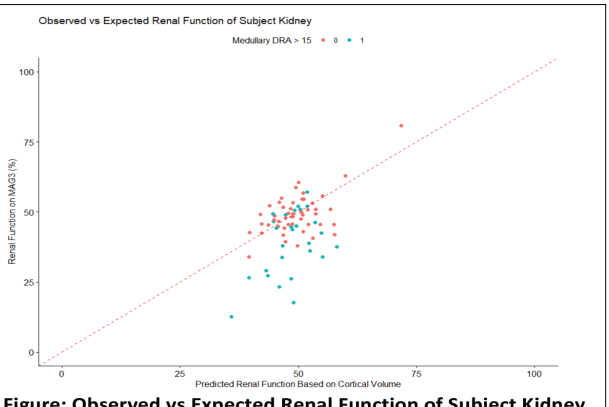

Figure: Observed vs Expected Renal Function of Subject Kidney. Kidneys with delayed medullary nephrograms (teal) deviate significantly from the 1:1 relationship between renal function and renal parenchymal volume predicted by prior work.

MP5-13

Contrast-Enhanced 4D Ultrasonography for the Evaluation of Complex Renal Cysts

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[1]Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA, USA; [2]Thomas Jefferson University Hospital, Philadelphia, PA, USA

Introduction and Objective: Management of complex renal cysts, historically dependent on the Bosniak system, is evolving. The objective of this pilot study was to use novel contrast-enhanced ultrasound (CEUS) technology to evaluate the enhancing/solid components of complex renal cysts and correlate to final pathology.

Methods: 14 patients undergoing surgery for Bosniak 2F-4 lesions participated in this IRB-approved pilot study. Ultrasound was performed pre-operatively. Patients underwent imaging of the mass in B-mode and power Doppler. Lumason ultrasound contrast was subsequently injected while imaging in 2D with dual B-mode and nonlinear harmonic imaging during collection of volumetric contrast-enhanced ultrasound. Following surgery, evaluation included pathologic stage and estimation of the lesion's solid proportion. Slices were selected through the lesion. An internal MATLAB program was used for selection of regions of interest (ROI), defined on B-mode images to include the entire lesion, while ROI on CEUS images included non-enhancing areas (cystic avascular regions). % enhancing volume was calculated: Fractional Tumor Vascularity = 1 – (Total Non-enhancing area/ Total lesion area). The primary endpoint was the correlation of 3D-derived fractional vascularity with solid estimation and tumor staging.

Results: Figure 1 demonstrates the selection of ROI on B-mode and CEUS for Patient 3. The fractional vascularity, pathologic estimation of the solid component, and final stage and grade are shown in Table 1.

Conclusions: The fractional vascularity was lowest in benign masses, with the exception of Patient 7 whose pathology showed a primarily solid oncocytoma. These preliminary results show CEUS may be a useful adjunct to evaluate the malignancy potential of complex renal masses.

Figure 1: Capture of ROI on select B-mode and CEUS images

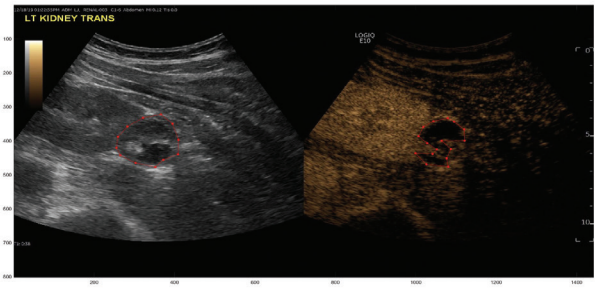

Table 1: Calculated Fractional Vascularity and Final Pathology

Patient No.	3D Fractional Vascularity (%)	Pathologic Evaluation of Solid Component (%)	Pathologic Stage	Pathologic Grade
1	4.59	0	--	--
10	15.65	10	--	--
8	41.45	10	--	--
2	44.87	10	pT3a	G3
6	49.92	60	pT1a	G2
5	53.36	20	pT3a	G2
15	59.08	60	pT1b	G2
3	60.67	40	pT1a	G2
11	66.02	--	pT1a	G3
7	87.87	85	--	--
9	89.20	40	pT1a	G2
12	90.20	20	pT1	G1
14	97.10	60	pT3a	G1

MP6-01

Effects of 2-Years Oral Testosterone Undecanoate (TU) Administration (JATENZO®) on Liver Function and Other Safety Measures in Hypogonadal Men

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[1]Lundquist Institute at Harbor-UCLA, Torrance, CA, USA; [2]University of Washington, Seattle, WA, USA; [3]UroMedix and South Florida Medical Research, Aventura, FL, USA; [4]Clarus Therapeutics, Northbrook, IL, USA; [5]Integrated Data Consultant Services, LaGrange, IL, USA

Introduction and Objective: Oral testosterone (T) replacement therapy (TRT) is the preferred choice for many hypogonadal men. Historically, the only oral TRT approved in the US was methyl-T but it is associated with hepatotoxicity. Recently, the FDA approved the first, oral TU formulation, JATENZO®. The safety of this novel, oral TU formulation was evaluated in hypogonadal men dosed for up to 2 years.

Methods: Two trials were conducted in hypogonadal men (serum T ≤ 300 ng/dL) age 18-75 years. Trial I was 2-arm, 12-month, active-controlled study, while Trial 2 was a 12-month extension. Statistical analyses were conducted with the subjects who completed Trial 1 and continued treatment in Trial 2, thus providing up to 2 full years of data.

Results: Overall, up to 81 subjects participated in both studies. T concentration increased from 208.3 ± 102.4 ng/dL (Mean ± SD) at baseline (BL) to 470.1 ± 396.5 ng/dL after 24 Mo with oral TU. There were no serious adverse events. There were no clinically significant changes in liver function tests – ALT (28.0 ± 12.3 to 26.6 ± 12.8 U/L), AST (21.8 ± 6.8 to 22.0 ± 8.2 U/L), and bilirubin (0.58 ± 0.22 to 0.52 ± 0.19 mg/dL. At d270, one subject had an ALT level of 227 U/L, which was > 5x the ULN (ULN for ALT = 45 U/L). Despite continued use of oral TU, his ALT dropped to 87 U/L, <2x ULN, at d290. There were no other LFT elevations. Systolic BP consistently showed a mean increase from BL between 3–6 mmHg. Prostate-related and CV measures changed initially, then stabilized in all subjects.

Conclusions: This oral TU formulation is an effective, long-term therapy for hypogonadal men and has a safety profile consistent with other approved T products. Notably, no evidence of liver toxicity was observed.

MP6-02

Inflatable Penile Prosthesis Patients Treated with Multimodal Analgesia Have Reduced Risk of Prolonged Opioid Dependence

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[1]*Einstein Healthcare Network, Philadelphia, PA, USA;* [2]*Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA*

Introduction and Objective: Utilization of multimodal analgesia (MMA) in inflatable penile prosthesis (IPP) surgery has demonstrated durable results in reducing opioid usage and improving pain control postoperatively. Rates of opioid dependence following opioid-based (OB) or MMA pain management in penile implant recipients has yet to be defined. We assessed the risk of prolonged narcotic usage following IPP surgery by comparing opioid-based management patients with multimodal analgesia patients.

Methods: This is a multicenter retrospective review of 344 three-piece IPP recipients who underwent implantation from 12/2014-12/2020. 133 patients (38.7%) were managed with OB regimen while 211 patients (61.4.0%) received MMA. Prolonged opioid dependence was defined as opioid prescriptions 90 days after surgery. Perioperative and postoperative opioid usage was assessed with the Prescription Drug Monitoring Program (PDMP). Patients were excluded if PDMP data was incomplete or preexisting dependence was identified.

Results: Postoperative inpatient narcotic use was higher in the OB group, with substantially more total morphine equivalents (TME) used (41.3 vs. 13.8, p<0.001). After discharge, the OB group required greater narcotic refills (31.5% vs. 9.8%, p<0.001) and higher total refill TME (276.0 vs. 22.3, p<0.001). IPP recipients managed with MMA had an absolute risk reduction of 3.6% in developing opioid dependence (ARR=0.036) while more OB patients developed opioid dependence (6/133, 4.5%) despite smaller OB cohort size. In those with prolonged opioid dependence, all 6 OB patients were primary IPPs while MMA patients were predominantly complex revision cases (p=0.045). OB and MMA groups demonstrated similar ages, incidence of chronic pain, and diabetes but differed in BMI (32.0 vs. 30.6, p=0.045) and race (p=0.001). Intraoperative factors did not demonstrate statistical significance.

Conclusions: Our series demonstrates that MMA recipients have reduced risk of prolonged narcotics dependence compared to OB, particularly after primary IPPs. Substantial differences in opioid use were noted postoperatively with MMA patients requiring fewer inpatient TMEs and fewer narcotic refills.

MP6-03

Does a Preemptive Quality of Life Clinic Increase Utilization of Treatment Options Following Radical Prostatectomy?

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Introduction and Objective: A men's health clinic (MHC) for patients undergoing radical prostatectomy (RP) was started to facilitate return of erectile function and continence. We hypothesized that MHC attendance would lead to a greater variety ED treatment as well as better incontinence care.

Methods: A retrospective cohort study was conducted of men undergoing surgery between Sept 2014 and Dec 2018. Primary outcomes were usage of ED aids, time to usage, and incontinence rates based on pads per day and need for incontinence procedure. We studied pelvic floor physiotherapy (PFPT) enrollment. Patients with follow-up less than 4 months were excluded.

Results: 404 men were included. Median (IQR) follow-up was 34.9 (SD 18.6) months. 160 (39.6%) men attended MHC. The cohorts were similar in regard to age, BMI, co-morbidities, and nerve-sparing. Men attending a MHC had higher utilization of daily tadalafil (86.9% vs. 66.4%, p<0.0001), on-demand PDE5i (73.8% vs. 64.0%, P=0.04), VED (33.2% vs. 16.0%, p=0.0001), ICI (24.4% vs. 14.3%, p=0.01), and IPP (6.3% vs. 2.5%, p=0.06). Time to initiation of on-demand PDE5i was 6.6 months (SD 8.1), VED at 6.1 months (SD 5.8), ICI at 13.8 months (SD 8.5), and IPP at 24.2 months (SD 10.0) Time to treatment was not significantly different between cohorts (p>0.05). We found an association between MHC attendance and PFPT (OR 2.89, CI: 1.55-5.42). We did not find a significant difference in pad usage at 1 (p=0.12) and 3 (p=0.31) months, nor between MHC attendance and undergoing an incontinence procedure (OR 4.71, CI: 0.94-23.66).

Conclusions: Men attending MHC are offered more options for ED and are more likely to pursue PFPT. There was no increased utilization of incontinence procedures. Attendance in a MHC should be advocated for men following RP.

MP6-04

A Comparison of the Psychosocial Impact of Penile Implant and Intracavernosal Injection Therapy for Erectile Dysfunction Using the Self-Esteem and Relationship (SEAR) Questionnaire

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Introduction and Objective: The few studies that do compare penile implants (PI) and intracavernosal injections (ICI) focus predominantly on sexual function leaving self-esteem and relationships understudied. The Self-Esteem and Relationship (SEAR) questionnaire was developed to provide a reliable tool to assess psychosocial variables of ED treatments. We hypothesized that patients with PI would have higher SEAR scores compared to patients treated with ICI.

Methods: IRB-approval was obtained to interview patients by phone who underwent ED treatment by a single surgeon. SEAR questionnaire results were calculated according to the previously described formula and individual questions and domains were compared using T-test statistics.

Results: Fifty patients (25 PI, 25 ICI) agreed to be interviewed for this study. Prostate cancer (n=21, 45%) and vascular disease (n=7, 14%) were the leading cause of ED in our cohort. PI patients on average suffered from ED for a longer period than patients on ICI (5.6 vs. 2.7 years, p=0.005). There were no differences in age or marital status. PI patients reported numerically higher total SEAR scores than PI patients (63 vs. 53, p=0.12). PI patients reported higher sexual relationships domain scores than ICI patients (64 vs. 46, p=0.04), especially in "I felt confident that during sex my erection would last long enough" (p=0.004), "I was satisfied with my sexual performance" (p=0.05), and "I felt confident about performing sexually" (p=0.02). There were no statistical differences in the confidence domain (p=0.89) or self-esteem (p=0.68) and overall relationship (p=0.80) sub-domains.

Conclusions: PI patients reported higher sexual relationship domain scores than ICI patients, while confidence, self-esteem, and overall relationships were similar. Regular use of the SEAR questionnaire may help to identify areas of post-treatment psychosocial needs in ED patients that may benefit from support groups or discussion with a counselor.

MP6-05

Patterns of Surgical Management of Male Stress Urinary Incontinence: Data from the AUA Quality (AQUA) Registry

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Introduction and Objective: Effective surgical treatment options for male stress urinary incontinence (SUI) are underutilized. Urethral bulking appears less efficacious, and cure is rare according to the recent AUA guidelines. We aim to describe contemporary patterns in SUI treatment utilizing the AQUA registry.

Methods: We identified men with SUI using diagnosis and procedure codes in the AQUA registry. Characteristics of the patient, surgeon, and practice were included in a multivariate analysis of predictors of management type.

Results: From 2014 to 2019, we identified 119,994 men with SUI and a total of 10,791 SUI procedures. Artificial urinary sphincter (AUS) was most common, followed by urethral sling and urethral bulking. Utilization of sling is increasing (p=0.02), while there was no change in AUS or bulking over time. The initial procedure chosen was bulking in 562 (13%) of men, sling in 1,638 (37%), and AUS in 2,241 (50%). Median follow-up after the first procedure was 277 days. Of men undergoing initial bulking, 237 men (42%) required a secondary procedure; 159 (67%) of this group had repeat bulking. Of men undergoing initial sling or AUS, 223 (14%) and 609 (27%), respectively, required a secondary procedure. Table 1 summarizes patient characteristics. On multivariate analysis, significant predictors of undergoing an open surgical procedure include history of radical prostatectomy, urethroplasty, or academic practice setting. Factors associated with increased odds of urethral bulking include a history of bladder cancer, hypogonadism, increased age of surgeon, or female gender of surgeon.

Conclusions: Utilization of urethral bulking remains stable albeit at lower rates than that of sling or AUS. Quality improvement initiatives can target the populations that are currently more likely to undergo bulking and may find more success with alternatives.

Table 1 – Factors associated with SUI procedures

Patient characteristics	Endoscopic (bulking)	Open (sling or AUS)	P-value
Age, mean (years)	76.7	74.4	<0.001
Race (White)	378 (67.3%)	2818 (72.6%)	
Race (Black)	86 (16.4%)	439 (83.6%)	
Race (Asian)	4 (11.4%)	31 (88.6%)	0.051
Race (Other)	10 (12.7%)	69 (87.3%)	
Race (Unknown)	84 (13.9%)	522 (86.1%)	
Diabetes mellitus	86 (15.3%)	558 (14.4%)	0.564
Prostate cancer	479 (85.2%)	3403 (87.7%)	0.095
Bladder cancer	48 (8.5%)	148 (3.8%)	<0.001
Radical prostatectomy	151 (26.9%)	1507 (38.9%)	<0.001
ADT	6 (1.1%)	50 (1.3%)	0.66
Low T	66 (11.7%)	374 (9.6%)	0.119
Radiation history	46 (8.2%)	372 (9.6%)	0.286
Prior urethroplasty	7 (1.2%)	113 (2.9%)	0.023
Surgeon characteristics			
Age, mean (years)	53.2	50.5	<0.001
Gender (Male)	461 (13.0%)	3072 (87.0%)	0.287
Gender (Female)	28 (11.6%)	213 (88.4%)	
Setting (Metropolitan)	547 (12.6%)	3784 (87.4%)	0.754
Setting (Non-Metropolitan)	15 (13.6%)	95 (86.4%)	
Number of Providers (<5)	81 (20.0%)	323 (80.0%)	
Number of Providers (5-20)	168 (9.9%)	1529 (90.1%)	<0.001
Number of Providers (>20)	313 (13.4%)	2027 (86.6%)	
Community Setting (Academic)	8 (5.5%)	137 (94.5%)	
Community Setting (Hospital)	0 (0.0%)	2 (100.0%)	
Community Setting (Multi)	58 (12.4%)	410 (87.6%)	0.015
Community Setting (Single)	485 (12.8%)	3295 (87.2%)	
Community Setting (Solo)	11 (23.9%)	35 (76.1%)	

MP6-06

A Comparison of Hospital Charges Between Secondary Robotic Pyeloplasty and Chronic Ureteral Stenting for Management of Recurrent Ureteropelvic Junction Obstruction

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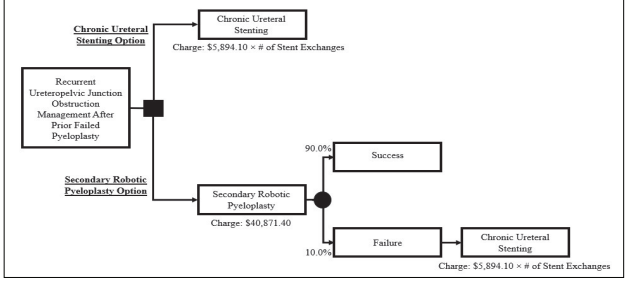
Introduction and Objective: We compared hospital charges for patients undergoing secondary robotic pyeloplasty (SRP) versus chronic ureteral stenting (CUS) for management of recurrent ureteropelvic junction obstruction (UPJO) after prior failed pyeloplasty.

Methods: We constructed a decision tree to demonstrate two options for UPJO management (Figure 1). We performed probability-weighted calculations based on success rates to determine total hospital charges for CUS and SRP. CUS was assumed to have a 100% success rate. Success rate for SRP was determined using data from our Collaborative of Reconstructive Robotic Ureteral Surgery database. Hospital charges were determined using the Pennsylvania Health Care Cost Containment Council database which contains data from centers across 5 counties in Pennsylvania. Total hospital charges to payers were calculated using room/board, ancillary, drug, equipment, specialty, and miscellaneous charges. We determined how many ureteral stent exchanges would be required for CUS to result in higher hospital charges compared to SRP.

Results: Success rate for SRP is 90%. Mean hospital charges for an SRP and a single ureteral stent exchange are $40,871.40 and $5,894.10, respectively. Total probability-weighted charges for both options were determined in terms of the number of stent exchanges. Total charge for CUS was $5,894.10×Number of Stent Exchanges. Total charge for SRP was calculated by adding the probability-weighted charge of a successful SRP (0.9×$40,871.40) to the probability-weighted charge of a failed SRP (0.1x[$40,871.40+$5,894.10×Number of Stent Exchanges]). Hospital charges for CUS were higher than hospital charges for SRP after 8 ureteral stent exchanges.

Conclusions: After 8 stent exchanges, CUS may result in higher hospital charges to payers versus SRP for management of recurrent UPJO after prior failed pyeloplasty. These data may factor into a patient's decision-making process for management of recurrent UPJO.

Figure 1: Decision Tree for Management of Recurrent Ureteropelvic Junction Obstruction



MP6-07

Surgical Planning for Urethral Reconstruction: Is Retrograde Urethrogram Alone Sufficient

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Introduction and Objective: The AUA Guidelines for male urethral stricture recommends use of cystoscopy, retrograde urethrography (RUG), voiding cystourethrography(VCUG), or ultrasound to evaluate urethral strictures. The current gold standard for stricture evaluation is RUG. The addition of VCUG aids in better visualization of the posterior urethra. In this study, we aim to determine if RUG can be used alone for preoperative planning.

Methods: After IRB approval, 247 men between 2015-2019 underwent urethral reconstructive procedures at our institution. Men who had prior urethral reconstruction and RUGs performed at outside facilities were excluded. The EMR of the resulting 192 men were evaluated for procedure listed in the preoperative visit as well as the procedure documented in the operative notes. Patients were divided into two groups: those who had procedure as planned and those who had intraoperative plan changes. Records of both groups were analyzed for whether or not RUG alone was performed versus RUG plus VCUG. Additionally, we analyzed the extent to which surgical plans changed.

Results: 192 men were analyzed. All RUGs were performed by the same surgeon who performed the reconstruction. In the planned group (N=168), VCUG was performed in 60% of patients. In the changed group (N=24), VCUG was performed in 67%. Univariate analysis using Fisher's Exact was used to analyze whether performance of VCUG correlated with intraoperative plan changes. There was no significant correlation between intraoperative surgical plan changes and performance of VUCG (p=0.65). With regards to how operative plans changed, 7 patients needed more extensive procedures and 17 patients needed less extensive procedures. There was no difference between extent of changed procedure between those patients who had VCUG performed and those who did not (p=0.2).

Conclusions: This data did not show a correlation with VCUG and intraoperative plan changes, indicating RUG alone may be sufficient for evaluation of urethral strictures

MP6-08

General Surgeons' Comfort and Urologists' Perceptions of Bladder Trauma Management

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Introduction and Objective: Bladder injuries often require immediate care and management by general surgeons (GS) and/or urologists. The extent of collaboration between the two specialties may vary between institutions and by presentation. Herein, we assess factors influencing GS to involve urologists in the management of bladder trauma.

Methods: Questionnaires were distributed electronically to GS and urologists through American College of Surgeons and American Urological Association chapters. Questionnaires contained eight bladder injury scenarios of increasing severity or complexity. Responses were graded on a Likert scale of 1-5 (1: least likely). GS were queried on their comfort level with each injury and likelihood that they would consult urology. Urologists were asked to provide their comfort level of GS managing each injury and likelihood that they would be consulted. Univariate and multivariate analyses were performed.

Results: Overall, 108 GS and 104 urologists responded to the questionnaire. While the perceived comfort of GS by urologists in the management of Grade I to Grade V bladder injuries decreased from 84% to 5%, respectively, GS reported a significantly higher comfort level when faced with these injuries (Grade I: 88% and Grade V: 31%, p<0.001). Despite this, the likelihood that GS would consult urology increased significantly as the injury severity increases (Grade I injury: OR 1.95, 95% CI 1.17-3.25, p=0.01; Grade V injury: OR 5.21, 95% CI 1.47-18.52, p=0.01). Contrary to urologists' perception, most GS indicated that pre-operative CT imaging demonstrating bladder injury, presentation outside normal working hours, and an intraoperative diagnosis were not factors as to whether urology would be consulted (all p<0.01). GS and urologists equally utilized a two-layer bladder closure (94%, p=1.0).

Conclusions: GS-reported comfort levels in the management of bladder injuries remained higher than urology-perceived comfort levels. We believe this work will allow for continued open discussion on the best manner to approach multidisciplinary management of bladder trauma.

MP6-09

Multi-Institutional Comparison of Non-Transecting Versus Transecting Primary Robotic Pyeloplasty for Ureteropelvic Junction Obstruction

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Introduction and Objective: There is a paucity of literature describing non-transecting pyeloplasty in the primary setting of ureteropelvic junction obstruction (UPJO) repair. Our objective is to describe surgical techniques and peri-operative outcomes of primary non-transecting robotic pyeloplasty (RP) compared to standard dismembered RP.

Methods: The Collaborative of Reconstructive Robotic Ureteral Surgery (CORRUS) multi-institutional database was queried retrospectively for all patients who underwent primary RP between 04/2012-08/2020. Patients were grouped according to surgical approach; Anderson-Hynes dismembered (transecting) RP or non-transecting RP (Fenger or Y-V Flap). Perioperative outcomes were compared using nonparametric independent sample median tests and chi-square tests; p<0.05 was considered significant.

Results: Of 133 patients, 115 (86.5%) underwent transecting and 18 (13.5%) underwent non-transecting RP. Median operative time (138.0 vs 134.0 min, p=0.66) and estimated blood loss (50 vs 50cc, p=0.12) were similar between transecting and non-transecting groups, respectively. Likewise, there was no difference in major (Clavien>2) complications between the surgical technique groups (p=0.08). At a median follow-up of 12.9 months, there was no difference in success between transecting and non transecting groups (92.2% versus 88.9%, respectively; p=0.64).

Conclusions: Given variable anatomical configurations of ureteropelvic junction obstruction (UPJO), including ureteral, vascular, and perihilar variations, a "one-size-fits-all" approach to pyeloplasty is inappropriate. Primary non-transecting RP showed similar operative time, EBL, complication rates, and surgical success to dismembered RP. The authors do not intend to suggest non transecting pyeloplasty replace dismembered pyeloplasty in the primary setting, especially for indications such as a crossing vessel; however rather hope to demonstrate that a primary non transecting approach in select patients is not inferior to a dismembered approach, and serves as an important technique in the armamentarium of the robotic urologist approaching difficult UPJO repairs.

Table 1: Patient Demographics and Surgical Outcomes

Primary RAL Pyeloplasty	Dismembered (n=115)	Non-Dismembered (n=18)	p value
Stricture Type			
Intrinsic Obstruction (%)	48 (41.7%)	16 (88.9%)	0.01
Crossing Vessel (%)	67 (58.3%)	2 (11.1%)	0.01
Median Age (IQR), Years	47 (30-61)	50 (35-58)	0.81
Median Body Mass Index (IQR), kg/m^2	25.0 (22.0-28.7)	28.4 (24.8-32.5)	0.10
Median Length of Stricture (IQR), Cm	1.0 (1.0-1.5)	1.3 (1.0-1.5)	0.16
Median ORT (IQR), Minutes	138.0 (108.0-186.3)	134.0 (100.0-200.0)	0.66
Median EBL (IQR), Milliliters	50.0 (20.0-50.0)	50.0 (25-75)	0.12
Indocyanine Green Use (%)	46 (40.0%)	9 (50%)	0.42
Intraureteral (%)	26 (22.6%)	4 (22.2%)	-
Intravenous (%)	20 (17.4%)	5 (27.8%)	-
Adjunctive Wrap for Reconstructed Ureter (%)	10 (8.6%)	1 (5.6%)	<0.01
Omental Flap (%)	3 (2.6%)	0 (0.0%)	-
Peri-nephric Fat Flap (%)	1 (0.9%)	0 (0.0%)	-
Amniotic Membrane Wrap	6 (5.2%)	1 (5.6%)	
Median LOS (IQR), Days	1.0 (1.0-2.0)	1.0 (1.0-1.0)	0.04
Median Follow Up (IQR), Months	13.5 (3.4-33.2)	7.1 (3.0-13.2)	0.17
Major (Clavien>2) Complications (%)	3 (2.6%)	2 (11.0%)	0.08
Surgical Success (%)	106 (92.2%)	16 (88.9%)	0.64

- Still needs to update P values! Stricture type + Adjunctive procedure use

MP6-10

Demucosalized Detrusor Muscle Flaps for Management of Complex Urethral Fistula

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Introduction and Objective: Radiation associated rectourethral (RUF) and urosymphyseal fistulas (USF) are complex urologic problems that often require urinary diversion. While reconstruction for RUF and USF have been studied in small case series with good short-term outcomes, little information exists on the optimal approach when reconstruction fails. We present a novel approach to fistula management using urinary diversion with subtotal cystectomy/ileal conduit (SC/IC) and creation of demucosalized detrusor muscle flaps (DDMF) for pelvic interposition. We propose that this technique optimizes wound healing and eliminates empty space in a hostile and infected field.

Methods: We performed a retrospective review of six patients with USF/RUF treated with SC/IC with DDMF performed by a single surgeon between January 2018 and December 2020. Surgical technique and perioperative follow up was described. Preoperative data, radiation history and prior interventions were collected. Short-term outcomes and peri-operative complications were recorded. (Table)

Results: Median age was 78 years old (range 71-81). All men had been treated for CaP with RT without evidence of biochemical recurrence. Of the six patients, three had transurethral resection of a bladder neck contracture prior to onset of symptoms. Two RUF patients had failed prior reconstruction. Mean length of stay was eleven days. Median follow up was four months. All USF patients have not had reoccurrence of pelvic sepsis at follow up. Thirty-day post-operative complications were all Clavien-Dindo 1 or 2.

Conclusions: Demucosalized detrusor muscle flaps with urinary diversion are a safe and feasible option for patients who fail or are not candidates for definitive reconstruction of RUF or USF. We propose that using vascularized muscle flaps allows for tissue interposition without added morbidity, need for distant muscle flaps or need for plastic surgery consultation.

Table 1 – Patient characteristics, clinical features, outcomes

Pt No.- Age	Type of Fistula	Type of Radiation	Cause of Fistulation	Prior Reconstruction	Fecal Diversion	EBL (L)	Disposition	30-Day Complications	Length of Stay (days)	Follow-up (months)	Recurrence of pelvic sepsis
1-80	USF	Cyberknife	TUR of BNC	N	N	0.8	SNF	Prolonged ileus	12	10	N
2-81	USF	IMRT + salvage cryotherapy	TUR of BNC	N	N	1.2	SNF	Prolonged ileus	12	8	N
3-80	RUF	RALP + salvage EBRT	CIC	Y	Y	0.3	Rehab	Prolonged ileus	9	4	N/A
4-78	RUF	EBRT + brachytherapy	TUR of BNC	N	N	0.4	SNF	New onset a. fib, c. difficile infection	7	4	N/A
5-75	RUF	Brachytherapy	TUR of BNC	N	Y	1.2	Home	DVT, prolonged ileus	15	3	N/A
6-71	RUF	Brachytherapy + salvage cryotherapy	AUS implant	Y	Y	0.6	Home	Wound infection	8	18	N/A

MP6-11

Robotic Approach for Distal Ureteral Reconstruction in Post-Radiation Ureteral Stricture

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Introduction and Objective: We are aiming to evaluate the role of robotic surgery in ureteral reconstruction following pelvic radiation.

Methods: We retrospectively identified all patients who underwent robotic reconstruction of the distal ureter in the last 10 years. Data collection included demographic data, preoperative baseline clinical data, operative data (operative time, EBL, conversion to open, surgical technique) and postoperative outcomes (early postoperative complications, hospital stay, 30-days readmission, postoperative and delta eGFR, and reintervention rate).

Results: A total of 31 cases of robotic distal ureteral reconstruction were identified. Patients were categorized into 2 groups. Group 1 includes radiation naive patients and group 2 includes patents with history of pelvic radiation. The two groups were similar regarding baseline demographic data. Initial presentation was similar in both groups with evaluation for hydronephrosis being the most common presentation. Operative time, EBL, conversion to open, and length of stay were similar in both groups. There was no difference regarding early complications, 30-days readmissions, and the duration of foley catheter or ureteral stent. Majority of patients in both groups reported symptoms improvement (100% in group 1 and 93.3% in group 2. Delta eGFR showed decrease eGFR in group 2 by 12 ml/min and improvement in group 1 by 3.1 ml/min, with no significant difference. One patient (6.7%) in group 2 required reintervention and underwent nephrectomy, while no patients in group 1 required reintervention.

Conclusions: Robotic surgery is a feasible approach for post-radiation distal ureteral reconstruction with a high success rate and relatively similar outcome to radiation naive patients. More studies with a larger number of patients are needed to fully evaluate the role of robotic surgery in post-radiation settings as an alternative for classic open surgery.

	Group 1 (No Radiation) No. 16 patients	**Group 2** (Post-Radiation) No. 16 patients	P value
Robotic system Si Xi	 9 (56.3%) 7 (43.7%)	 6 (40%) 9 (60%)	0.479
Technique Direct ureteroneocystostomy Psoas hitch Boari flap & Psoas Hitch Revision of uretero-iliial anastomosis	 5 (31.3%) 2 (12.5%) 7 (43.8%) 2 (12.5%)	 8 (53.3%) 0 4 (26.7%) 3 (20%)	0.215
Operative time (mean, SD)	217 (83)	247 (126)	0.468
Conversion to open	1 (6.3%)	1 (6.7%)	1
EBL (median. Range)	100 (50-250)	100 (5-400)	0.400
Length of hospital stay (median, Range)	2.5 (1-31)	3 (1-38)	0.312
Urine leakage on cystogram	0	2 (14.3%)	0.209
Early postoperative complications Ileus Bleeding requiring transfusion Uretero-enteric fistulation Neuropathy	 1 (6.3%) 0 0 1 (6.3%)	 0 1 (6.7%) 1 (6.7%) 0	0.235
30-days readmission	1 (6.3%)	2 (13.3%)	0.600
Postoperative UTI	4 (25%)	4 (26.7%)	1
Duration of post-op urinary catheter (median. Range)	14 (7-20)	16 (11-35)	0.256
Duration of post-op ureteral stent (median, Range)	23 (9-67)	38 (10-70)	0.163
Postoperative reported symptoms improvement	16 (100%)	14 (93.3%)	0.484
Last follow-up eGFR (median, Range)	66.9 (9.6-149.1)	45.2 (3.59-119)	0.053
Delta eGFR (median, Range)	3.1 (-59.3 - 33.9)	-12 (-80.4 - 29.3)	0.114
Reintervention Nephrectomy	 0	 1 (6.7%)	0.484
Duration of follow-up (median, Range)	9.52 (2-33)	7.4 (1-62)	0.664

Table 2 Operative data and postoperative clinical and functional outcomes

MP6-12

Effect of Urology Consult on Renal Trauma Outcomes

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Introduction and Objective: Renal trauma is unique in that acute management involves the trauma team, primarily urology, or joint management. The ideal management pathway has yet to be established. We aim to describe rates of urology consultation following renal trauma and assess subsequent impact on outcomes.

Methods: We conducted an IRB-approved retrospective review of patients at a Level I trauma center sustaining renal trauma. We collected demographic, radiologic, and surgical information. The primary endpoints were nephrectomy, change in creatinine, post-operative AKI, and need for dialysis during hospital admission. Analyses were performed using STATA with $p<0.05$ considered significant.

Results: From 2014-2021, 127 patients with median age 29 years incurred renal trauma. In 98 (77.2%) cases, urology was not consulted. Injury severity score did not significantly differ among cases with and without a urology consult (22.18 vs. 21.18;p=0.357). The AAST grade was only reported in 10 (7.9%) patients. The risk ratio of poor renal outcome with consult to urology was 1.33 (p=0.230). The risk ratios of nephrectomy, need for dialysis, AKI with consult to urology were 1.13 (p=0.441), 1.0 (p=0.641), and 1.59 (p=0.170), respectively.

Conclusions: Urology consult was not associated with a statistically significant difference in indicators of poor renal outcome. Our data support that current management strategies with and without urology optimize outcomes. In our center, future quality improvement may involve better compliance with AAST Renal Trauma Grading, which was lacking.

Table 1. Renal outcomes by consult to urology.

Characteristic	Consult to Urology n (%)		
	With Consult (n=29)	Without Consult (n=98)	p-value
Injury Severity Score	22.18 ± 2.54	21.18 ± 1.27	0.357
Injury Type			
Penetrating	14 (48.3)	53 (54.1)	0.303
Blunt	15 (51.7)	45 (45.9)	
Nephrectomy			
Yes	9 (31.0)	27 (27.6)	0.715
No	20 (69.0)	71 (72.4)	
Average Change in Creatinine (mg/dL)	0.63 ± 0.15	0.45 ± 0.08	0.148
Post op AKI			
Yes	8 (27.6)	17 (17.3)	0.223
No	21 (72.4)	81 (82.7)	
Dialysis			
Yes	2 (6.9)	6 (6.1)	0.880
No	27 (93.1)	92 (93.9)	
Poor Renal Outcome*			
Yes	11 (37.9)	28 (28.6)	0.337
No	18 (62.1)	70 (71.4)	

*Poor renal outcome defined by creatinine

MP6-13

Characterizing the Epidemiology and Management of Urological Trauma in Baltimore, Maryland

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Introduction and Objective: Trauma is the leading cause of death in patients under 45 causing 120,000 deaths annually in the United States, 10% of which are genitourinary. Here, we aim to assess the frequency, management, and course of various urological traumas at an urban medical center with the goal of improving management of these patients.

Methods: 211 patients were identified who had sustained injuries to the genitourinary organs and were treated at Johns Hopkins from 2014-2021. Various clinical metrics were assessed, including length of stay (LOS), number of operations, specialties consulted, and presenting symptoms.

Results: A majority of urological trauma cases (125, 59%) were due to violent crime, defined as gun-shot wounds (GSW), stab wounds and physical altercations. The most common causes of injury were GSW (103, 48.8%) and motor vehicle accidents (58, 27.5%). Hematuria was present in 55% (116) of urological injuries. 93 (44%) cases involved a urological consult, with 37 (21%) seen in outpatient urology clinic. Furthermore, while renal/adrenal injuries were the most commonly injured organs (123, 58%), these injuries were the least likely to involve a urological consult ($p < 0.001$). Average overall LOS was 11.7 days, the highest for ureteral injuries (21.2 days) and lowest for urethral injuries (5.3 days). Mortality from such injuries was difficult to assess as patients that were deceased on arrival were excluded from our cohort, and several patients were lost to follow-up post-operatively.

Conclusions: Urological trauma is a major public health concern, particularly in inner city settings with high violent crime. Patients who experience urological trauma are often lost to follow-up, raising concerns for long term outcomes – especially as such outcomes are necessary for determining consequences of conservative and surgical management.

Table 1. Characteristics of urological trauma cases presenting at JHH ED from 2014-2021.

Characteristic	N (%)							
	Total	GU Organ Injured						
		Kidney/Adrenals	Ureter	Bladder	Urethra	External Genitalia	Multiple	p-value
Number of Patients	211	123 (58%)	6 (2.8%)	23 (11%)	5 (2.4%)	37 (18%)	17 (8.1%)	
Mean Age at Time of Injury (years)	33.8	33.9	26.2	41.9	34.4	26.8	37.4	
Mean LOS (days)	11.7	11.6	21.2	13.1	5.3	5.7	18.8	
Mean # of OR Visits	1.8	1.47	3	2.1	1.5	1.8	3.1	
Sex								0.038
Male	176	96 (55%)	5 (2.8%)	18 (10%)	4 (2.3%)	37 (21%)	16 (9.1%)	
Female	35	27 (77%)	1 (2.9%)	5 (14%)	1 (2.9%)	0 (0%)	1 (2.9%)	
Race								0.048
White	36	22 (61%)	1 (2.8%)	5 (14%)	2 (5.6%)	0 (0%)	6 (17%)	
Black	164	94 (57%)	5 (3.0%)	17 (10%)	2 (1.2%)	35 (21%)	11 (6.7%)	
Other	10	7 (70%)	0 (0%)	1 (10%)	1 (10%)	1 (10%)	0 (0%)	
Mechanism of Injury								0.007
GSW	103	50 (49%)	2 (1.9%)	13 (13%)	1 (1%)	28 (27%)	9 (9%)	
MVC	58	32 (55%)	2 (3.4%)	9 (16%)	3 (5.2%)	6 (10%)	6 (10%)	
Fall	18	16 (89%)	0 (0%)	0 (0%)	1 (5.6%)	0 (0%)	1 (5.6%)	
Other	32	25 (78%)	2 (6.2%)	1 (3.1%)	0 (0%)	3 (9.4%)	1 (3.1%)	
Injury due to Violent Crime?								0.519
Yes	125	70 (56%)	3 (2.4%)	13 (10%)	2 (1.6%)	27 (22%)	10 (8.0%)	
No	86	53 (62%)	3 (3.5%)	10 (12%)	3 (3.5%)	10 (12%)	7 (8.1%)	
Urology Consult?								<0.001
Yes	93	21 (23%)	5 (5.4%)	17 (18%)	4 (4.3%)	33 (35%)	13 (14%)	
No	114	101(89%)	0 (0%)	6 (5.3%)	0 (0%)	4 (3.5%)	3 (2.6%)	
Outpatient Follow-up by Urologist								<0.001
Yes	37	7 (19%)	3 (8.1%)	3 (8.1%)	4 (11%)	14 (38%)	6 (16%)	
No	174	116 (67%)	3 (1.7%)	20 (11%)	1 (0.6%)	23 (13%)	11 (6.3%)	
Hematuria at Presentation?								<0.001
Yes	116	65 (56%)	3 (2.6%)	21 (18%)	5 (4.3%)	9 (7.8%)	13 (11%)	
No	94	57 (61%)	2 (2.1%)	2 (2.1%)	0 (0%)	28 (30%)	4 (4.3%)	

Video Abstracts

V-01

Diagnosis and Treatment of Pelvic Organ Prolapse Following Radical Cystectomy
M. Davis, K. Woodburn, L. Richter
MedStar Washington Hospital Center / MedStar Georgetown University Hospital, Washington, DC, USA

V-02

Use of SPY Fluorescent Angiography During Urinary Diversion
G. Prillaman, C. Yeaman, S. Isharwal, T. Krupski
University of Virginia, Charlottesville, VA, USA

V-03

Step-by-Step Robotic Ureteral Re-implantation: Intravesical and Extravesical Techniques
S. Kuppa, M. Lee, C. Okoro, D. Eun
Lewis Katz School of Medicine at Temple University, Philadelphia, PA, USA

V-04

Robotic Ureteral Reconstruction for Management of a Recurrent Stricture After Prior Ureterocalicostomy
M. Lee, J. Jeong, C. Okoro, S. Kuppa, D. Eun
Temple University Hospital, Philadelphia, PA, USA

V-05

Intraoperative Management of Incidentally Identified Right Ectopic Ureter Inserting at Bladder Neck during RALP
A. Alzubaidi, B. Baer, J. Raman
Penn State Health Medical Center, Hershey, PA, USA

V-06

Combined Robotic and Endoscopic Pyelolithotomy in a Pelvic Kidney
A. Higgins, A. Nourian, J. Cohn, J. Friedlander
Einstein Healthcare Network, Philadelphia, PA, USA

V-07

Robotic Assisted Laparoscopic Takedown of an Entero-Ileal Conduit Fistula
D. Roberson, I. Soriano, P. Mucksavage
University of Pennsylvania, Philadelphia, PA, USA

DP-01

Persistence of Opioid Reduction Habits 1 Year After Implementation

A. Quinn[1], E. Mann[1], J. Mark[1,2], M. Mann[1,2], E. Trabulsi[1,2], C. Lallas[1,2], L. Gomella[1,2], T. Chandrasekar[1,2]
[1]Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA, USA; [2]Thomas Jefferson University Hospital, Philadelphia, PA, USA

Introduction and Objective: Changing prescribing habits amongst surgeons is an important mechanism of addressing the opioid epidemic. Urologists have made strides in reducing opioid prescribing in the postoperative setting, particularly in post-prostatectomy patients. While several prospective interventional studies have demonstrated reduction in opioid prescribing in the post-operative setting, there is limited evidence on whether these interventions have a durable impact beyond the initial time frame. Our study aims to assess the durability of such an institutional protocol one year after intervention.

Methods: Thomas Jefferson University Hospital (TJUH), a large urban academic institution, implemented opioid reduction measures for patients undergoing robotic-assisted laparoscopic prostatectomy (RALP) via a prospective 2-month protocol in July 2019. Patients who received a RALP prior to opioid reduction measures (1/1/2017 and 6/30/2019) and after these measures were implemented (7/1/2019 and 6/30/2020) were included. Opioid prescription and utilization patterns in the hospital setting and upon discharge were compared between the two cohorts.

Results: 225 and 163 patients received a RALP prior to and following opioid reduction measures, respectively. There was no significant difference between demographics, NCCN risk groups, complication rates, and length of stay greater than 2 days. When comparing opiate use in the hospital setting, there was a significant sustained reduction in opiate receipt during hospital stay (65.0% before vs. 53.5% after, $p = 0.002$) and amount prescribed (42.3 morphine milligram equivalents (MME) before vs. 22.9 MME after, $p < 0.001$). When looking at opiate prescription patterns at discharge, there was a significant sustained reduction in opiate receipt at discharge (93.3% before vs. 42.9% after, $p < 0.001$) and amount prescribed (139.0 MME before vs. 51.9 MME after, $p < 0.001$).

Conclusions: Simple opioid reduction measures in the post-operative setting, in the form of protocol shifts and EMR nudges, can yield durable changes in prescribing patterns beyond the initial study period.

DP-03

Concurrent Nephrolithiasis During Partial Nephrectomy: A Multi-Institution Retrospective Analysis of Post-Operative Complications

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[1]George Washington University School of Medicine and Health Sciences, Washington, DC, USA; [2]East Carolina University Brody School of Medicine, Greenville, NC, USA; [3]George Washington University Hospital, Washington, DC, USA; [4]Sibley Memorial Hospital, Washington, DC, USA

Introduction and Objective: Partial nephrectomy (PN) for renal cell carcinoma (RCC) has become the standard of care for patients with tumors <7cm and individuals with imperative indications for nephron preservation. Synchronous renal calculus disease, a rare but important consideration given potential for ureteral obstruction and urine leak after PN, is not widely reported. In this study, we describe a multi-institution experience on calculus management and postoperative complications in patients with concurrent renal calculi at the time of surgery. Our objective was to provide a descriptive analysis on the impact of synchronous nephrolithiasis with regards to postoperative complications in patients undergoing PN for suspected RCC.

Methods: A multi-institutional chart review and retrospective analysis of all patients who underwent PN from 2013-2020 was conducted from an IRB-approved database. Data on demographics, imaging, stone characteristics, and stone management were gathered. Statistical analysis included Fisher's exact test to assess complication differences between patients treated and untreated for calculi before or during surgery.

Results: 32/256 (13%) patients screened had concurrent renal calculi at the time of surgery.14/32 (44%) had ipsilateral, 9/32 (28%) had contralateral, and 9/32 (28%) had bilateral stones. 5/32 (16%) received stents at the time of surgery. 2/32 (6%) received concurrent pyolithotomy at the time of surgery. 4/32 (16%) had obstructing stones. Pertinent postoperative urinary system complications included hematoma (2), urine leak (1), urinary retention (1), IVC thrombosis (1), acute kidney injury (1), and flank pain (1). 1/7 (14%) with postoperative complications was treated prior to surgery. There was no significant difference in complications between patients treated or untreated for stones prior to surgery (7 treated, 25 untreated; $p = 1$)

Conclusions: Our results indicate that untreated nephrolithiasis was not associated with greater complication rates compared to treated patients. Based on these findings, patients with asymptomatic stone disease may be able to delay stone disease treatment until after PN.

DP-02

More Stress or Relief? Patient Perceptions of Oncologic Follow-up After Surgery for Urologic Malignancies

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Introduction and Objective: In colorectal, cervical and breast cancers, follow-up can influence patient stress about disease recurrence. However, such experiences are less defined for urologic malignancies. Thus, we developed a cross-sectional prospective survey study to assess kidney (Kid), prostate (Pros), and bladder (Bld) cancer patient perceptions and expectations of oncologic follow-up following surgery.

Methods: Eligible patients included those with pTanyNanyM0 Kid, Pros, and Bld cancer presenting > 60 days following primary surgery treatment. Adjuvant therapy or a documented recurrence were exclusion criteria. Validated questionnaires assessing attitudes towards follow-up and strategies to combat stress were administered to patients prior to revealing testing results.

Results: 337 patients were prospectively surveyed from 2018-2020: 127 (38%) Kid, 134 (40%) Pros, and 76 (23%) Bld. In follow-up, patients showed satisfaction with provided strategies to combat recurrence anxiety (Kid 86%, Pros 81%, Bld 85%). However, 16% of patients reported wanting, but not receiving, strategies for fear reduction. Most patients reported diagnostic tests were "Not at All" burdensome (Kid 86%, Pros 94%, Bld 82%) and disagree that fewer tests would alleviate anxiety (Kid 89%, Pros 91%, Bld 84%). The majority reported an increased sense of worry if there were no cancer follow-ups (Kid 84%, Pros 80%, Kid 81%), and preferred their specialist than family physician for follow-up (Kid 89%, Pros 91%, Bld 95%). When responses were stratified by recurrence risk, no significant differences existed for any cancer type. However, Pros patients did show a difference in fear of recurrence ("Not at All:" ≤T2 38%, ≥T3, 19%).

Conclusions: Urology patients appear satisfied with their oncologic follow-up. Irrespective of cancer type, patients agree follow-up with urology providers are reassuring and diagnostic tests are not burdensome, whereas omission of visits would increase worry. Interestingly, up to 20% of patients desired additional strategies to combat fear, indicating opportunity for improvement.

DP-04

Perioperative Cost Comparison Between Percutaneous Microwave Ablation vs. Partial Nephrectomy for Small Renal Masses

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Introduction and Objective: To determine and compare the perioperative cost associated with percutaneous microwave ablation (MWA) and partial nephrectomy for treatment of small renal masses.

Methods: We conducted a retrospective cohort analysis of a prospectively maintained IRB approved small renal mass database. The database was queried for patients treated with either microwave ablation or partial nephrectomy from 2015-2020. Financial costs related to the procedural encounter and costs related to complications were collected. Total cost is represented by the sum of medical center cost and physician related cost. Statistical analysis was performed in SAS using Student's T-Test and Wilcoxon Rank-Sum Test.

Results: A total of 279 patients were identified, 165 patients underwent MWA and 114 underwent partial nephrectomy. All partial nephrectomies were robotic-assisted. The mean total cost was $20,536 for partial nephrectomy and $6,470 for MWA ($p<0.0001$). Five patients (3%) who underwent MWA experienced major complications (Clavien-Dindo 3 or greater), and eight patients (7%) who underwent partial nephrectomy experienced complications. For those patients who underwent MWA and did not have a major complication had an average medical center cost of $5,174 compared to $8,990 for those with a complication ($p=0.36$). For those patients who underwent partial nephrectomy, those who had a major complication had an average medical center cost of $15,138 compared to $28,940 for those who did have a complication ($p=0.008$).

Conclusions: MWA demonstrates lower perioperative cost than partial nephrectomy for treatment of small renal masses. Further, complications that occurred related to MWA were less costly than those incurred from partial nephrectomy, however our study did not evaluate long term cost attributable to local recurrence. Updated cost-effectiveness studies for small renal mass treatment should be performed with this updated cost information.

Table 1. Major Complications

	Complication	Clavien-Dindo Grade	Occurred during procedural admission	Cost
MWA	Pneumothorax	3a	Yes	$825
	Pneumothorax	3a	Yes	$825
	Subcapsular Hematoma	4	Yes	$2,566
	Colorenal Fistula	3b	No	$14,360
	Urine Leak	3b	No	$9,489
RA-PN	Pseudoaneurysm	3a	No	$9,808
	PE & RP hemorrhage	4	Yes	$4,506
	Hypotension	4	Yes	$16,527
	Urine Leak	3b	No	$2,121
	Pseudoaneurysm	3a	No	$8,494
	Mesenteric Ischemia	5	No	$42,191
	Cardiac Arrest	4	Yes	$3,096

DP-05

Single Institution Review of Prevena Epidermal Wound Vacuum Usage in Patients Undergoing Inguinal Lymph Node Dissection for Penile Cancer

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Introduction and Objective: Inguinal lymphadenectomy (ILND) can be fraught with wound complications. These include flap necrosis, lymphocele, lymphedema, wound infection and dehiscence. Our institution began using the Prevena epidermal vacuum (VAC) for ILND in 2019. Theoritically epidermal vacuum (VAC) device may lead to sealing of lymphatic vessels through sub-atmospheric pressure thereby reducing wound complication rate. Our objective was to review our initial experience.

Methods: Patients were identified who underwent ILND for high risk penile cancer by a single surgeon (SHC) at the University of Virginia. All superficial and deep ILND were performed using the standard template. VACs were placed over each closed incision with the equipment representative present. Incisions were closed with deep dermal interrupted Vicryl suture and running Monocryl subcuticular suture. Jackson Pratt drains were placed in the dissection beds. The VAC was removed at home on post-operative day 7. Drains were removed after output was < 50 cc over 24 hours.

Results: We identified 7 patients undergoing ILND with VAC placement between August 2019 and January 2021. Average age was 66 years old [95% CI 59, 73] and average body mass index was 28.5 kg/m^2 [95% CI 24.4, 32.6]. Although no patients had diabetes, 4 patients were current every-day smokers. Average number of lymph nodes per side in ILND removed was 11.3 (SD 2.9). All patients were discharged home on post-operative day 1. One patient required readmission for lymphedema. Complications and tumor stages are listed in Table 1.

Conclusions: This case series suggests acceptable wound outcomes in patients undergoing ILND with VAC. Our results support potential initiation of a randomized prospective trial with VAC in order to provide level 1 evidence for its routine usage.

Laterality and Extent	Tumor Stage	Complication(s)	Complication Grade
Bilateral - Superficial and deep	pT1b N3	None	0
Right - Superficial Left - Superficial and deep	pT1b N1	Flap Necrosis	2
Bilateral - superficial and deep	pT3 N2	Wound Dehiscence; Lymphedema	3
Bilateral superficial	pT3 N0	Lymphedema	2
Right - Superficial, Left - Superficial and deep	pT3 N1	None	0
Right - Superficial Left - Superficial and deep	pT2 N1	None	0
Right - Superficial	pT2 N0	None	0

Table 1 Complication Grades based on CTVAE 5.0.

DP-06

Decreased Inpatient Opioid Exposure After Robot Prostatectomy with Implementation of Opioid Stewardship Protocols– 2 Year Evaluation from the Pennsylvania Urologic Regional Collaborative (PURC)

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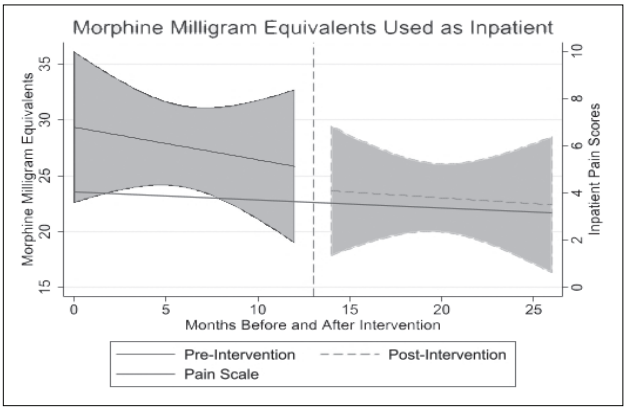
Introduction and Objective: Exposure to postoperative opioids is associated with worse postoperative outcomes and opioid dependence. The objective of this study is to evaluate the impact of implementing an opioid sparing protocol(OSP) for robotic prostatectomy (RALP) on inpatient opioid use.

Methods: An OSP was implemented for RALP at three institutions within the Pennsylvania Urologic Regional Collaborative (PURC). The intervention was based on three priorities: maximizing local anesthetic, expanded use of non-opioids and systematic decrease of opioid prescriptions. We compared inpatient opioid use 12 months before the intervention and 12 months after, with a one-month washout period during implementation. Opioids were measured as morphine milligram equivalents (MME). Pain scores were captured by visual analog scale of 0-10, 10 being the worst pain.

Results: Overall, 981 patients underwent RALP. Prior to OSP, median MME was 20 (IQR 10-34), of which 1.34 MME (IQR 0-5.36) was given intravenously. After implementation, significantly less was given (median 16.5MME, IQR 1.34-30.4, p=0.01). Twenty-three percent (225/978) did not need any opioids at all postoperatively. Before OSP, 98% (44/45) of the patients who had no opioid use while an inpatient were still given an opioid prescription (median 10 pills). After implementation, only 25% (25/101) were given an opioid prescription (p<0.001). With decreased opioid use, the overall inpatient pain scores improved slightly, going from a median score of 4 (IQR 3-5) to 3 (IQR 2-4) after implementation (p<0.01).

Conclusions: Adequate inpatient pain control is feasible without opiates for the majority of patients undergoing RALP. Implementing an opioid reduction protocol can decrease unnecessary opioid use and prescription rates when not needed. Policies to encourage opioid stewardship should be designed to encourage adoption of such programmatic change.



DP-07

Influence of Patient Clinicopathologic Variables on Prostate Tumor Upgrading at Radical Prostatectomy

B. McSweeney[1], D. Nemirovsky[1], A. Reddy[1], C. Klose[2], J. Chen[3], M. Atienza[1], D. Imtiaz[1], S. Haji-Momenian[4], M. Whalen[4]
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Introduction and Objective: Tumor upgrading has been linked to worse surgical outcomes and a higher risk of biochemical recurrence. Factors associated with upgrading are important to identify in order to minimize potential adverse outcomes. Specifically, multiparametric MRI (mpMRI) has been proposed to improve diagnostic accuracy and reduce post-prostatectomy upgrading. In this study, we seek to determine how patient characteristics and screening tools may predict upgrading of tumor pathology.

Methods: A single institution review of patients with Gleason grade ≤ 3+4 tumors on biopsy who had undergone a radical prostatectomy between 2016-2020 was conducted an IRB approved mpMRI database. Upgrading was defined as a Gleason score ≥ 4+3 on final pathology. Upgrading rates were compared via unpaired t-tests or one-way ANOVA. Multiple logistic regression was used to compare the impact of patient and pathologic characteristics on upgrading.

Results: N=73 patients with biopsy Gleason ≤3+4=7 who had undergone radical prostatectomy were identified. 34.2% of tumors upgraded. Both Black and White patients had similar rates of upgrading (28.6% and 35.2%, p=0.5785). There was no significant difference in upgrading based on insurance (Medicare=35.3%, Medicaid=28.6%, Private=35.3%, p=0.9436). PSA measurements and 4K scores did not differ amongst upgrading and non-upgrading tumors, and upgrading rates were not significantly different for PSA<10ng/mL or PSA 10-20ng/mL (32.7% and 54.5%, p=0.2200). There was no difference in upgrading between patients with a PI-RADS score of 3, 4, or 5 (20.0%, 37.9%, and 36.4%, p= 0.5619). Upgrading odds ratios for race, insurance, PSA, and PI-RADS score were similar.

Conclusions: The lack of significant differences in race- and insurance-based prostate Gleason grade upgrading is encouraging in regards to reducing discrepancies in patient care. The fact that the PI-RADS scoring, as well as PSA and 4K were unable to predict tumor upgrading likely reflects small sample size, but emphasizes the need for novel predictive tools for pathologic upgrading.

DP-08

Active Surveillance or Watchful Waiting in Clinically Low-Risk Prostate Cancer Patients in the SEER Database With and Without an Oncotype DX Genomic Prostate Score Assay

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Introduction and Objective: The Surveillance, Epidemiology, and End Results (SEER) Program collects cancer data on approximately 35% of the US population. The Oncotype DX Genomic Prostate Score® (GPS™) assay is used to help guide treatment decisions at prostate cancer diagnosis. We linked data from the SEER registries with results from the GPS assay and evaluated determinants of selection of active surveillance/watchful waiting (AS/WW) for patients diagnosed with localized clinically low-risk prostate cancer.

Methods: The SEER data were restricted to patients diagnosed with localized prostate cancer from 2013 through 2017 and linked to GPS data from 2013 through 2018. Eligible patients were classified into NCCN risk groups using clinical variables. We used multivariable logistic regression to identify factors associated with selecting AS/WW as initial management.

Results: 120,223 patients were included. Median age was 64 years, 70% were white, and 44% were NCCN Very Low/Low, 27% Favorable Intermediate, 22% Unfavorable Intermediate, and 7% Unknown Intermediate risk. AS/WW percentages increased by year, from 18.3% (95% CI: 17.8, 18.8) in 2013 to 27.1% (26.5, 27.7) in 2017. Among the 5,553 (4.6%) patients with a GPS result 48.8% (47.5, 50.1) had AS/WW, compared to 21.6% (21.3, 21.8) with no GPS result ($p < 0.001$). The percentage of patients on AS/WW decreased as the GPS result increased: 58.3% (56.1, 60.4) for GPS results 0-20, 47.4% (45.6, 49.3) for 21-40, and 27.1% (23.8, 30.6) for >40. In a multivariable logistic regression model that included age, race/ethnicity, year of diagnosis, and NCCN risk group, receiving a GPS result (vs no GPS result) was associated with AS/WW selection (OR 2.7 [95% CI 2.5, 2.9], $p < .001$).

Conclusions: While overall use of AS/WW increased from 2013 to 2017, the GPS assay was independently associated with AS/WW, after adjusting for year of diagnosis and other covariates.

DP-09

Comparison of Highest Grade Tumor Percentage in Core Samples from MRI-targeted Biopsy and Systematic Biopsy for Prostate Cancer Diagnosis

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Introduction and Objective: The advent of magnetic resonance imaging (MRI)-targeted biopsy(TB) has allowed for higher rate of detection of clinically significant prostate cancers than systematic biopsy(SB). However, it remains to be demonstrated if the improved targeting also leads to more accurate representation of tumor volume by sampling the center, rather than periphery, of the tumor nodule. This study aims to compare the two biopsy methods in its ability to detect a higher percentage of the highest grade tumor in core samples.

Methods: We examined the biopsy reports of patients who underwent prostate cancer biopsy from 2015 to 2020. A total of 411 patients with MRI-visible prostate lesions received both MRI-TB and SB. The core samples with the highest Gleason scores were isolated for each biopsy method, followed by identification of the corresponding maximum percentage tumor. T-test was performed comparing the maximum tumor percentages for the highest Gleason scores between MRI-TB and SB.

Results: Of the 411 patients, those with benign biopsy results for both TB and SB were excluded, resulting in 213 (51.8%) patients for analysis. The TB demonstrated an equal or greater % tumor in the highest biopsy core in 166 (77.9%) of cases. In cases where SB % tumor was >TB % tumor, 42 cases were due to no tumor on TB, and 5 cases (2%) were TB<SB. Overall, the mean maximum percentage of tumor in the core with the highest Gleason score was higher for TB vs. SB (45.1% vs. 35.4%, p=0.009). This reflects a 27% increase in diagnosed tumor diameter, and 2.1-fold increase in inferred tumor volume.

Conclusions: In men that underwent both MRI-TB and SB, the TB more accurately captured prostate cancer tumor volume.

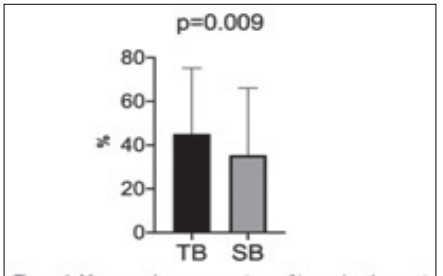


Figure 1. Mean maximum percentage of tumor involvement in the core with the highest Gleason Score

DP-10

Early Return to Continence preserved with Suprapubic Catheter following Retzius-sparing Prostatectomy

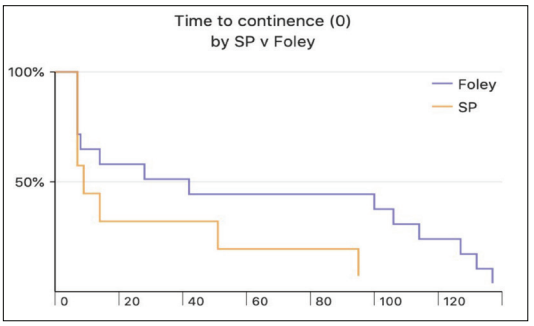
C. Delgado[1], K. Muzzi[1], S. Engelsgjerd[2], N. Shaw[2], K. Kowalczyk[2]
[1]Georgetown University School of Medicine, Washington, DC, USA; [2]MedStar Georgetown Department of Urology, Washington, DC, USA

Introduction and Objective: Retzius-sparing RARP (RS-RARP) provides early and durable postoperative continence without sacrificing oncologic control. While suprapubic tube (SPT) have been used in standard RARP, their use (technically easier with RS-RARP) have not been well studied with RS-RARP. We examined post-operative continence outcomes for SPT compared to urethral catheter (UC) after RS-RARP.

Methods: We conducted a retrospective review of all RS-RARP from June 2020 to May 2021 to measure the early continence outcomes. Continence was measured using the Expanded Prostate Cancer Index Clinical Practice (EPIC-CP), which defines continence as the use of 0-1 safety pads. Patients with intraoperative complications and salvage prostatectomy were excluded.

Results: Forty-four patients met inclusion criteria. Twenty-two patients with SPT and 22 with UC were included. There was no significant difference between groups for demographic or oncologic outcomes (Table 1). Pre-operative overall EPIC scores were similar (7.2 v 6.9), although patients who went on to have UC had higher baseline EPIC-UI scores (0 ± 0.45 v 1 ± 0.92). Patients in both groups had early return to continence (13 ± 18.0 v 37± 53.5).

Conclusions: Patients undergoing RS-RARP have early return to continence which is consistent with prior studies. There was an improvement in early continence in the SPT group compared to UC, driven by continence at time of catheter removal that did not reach significance (Figure 1). Placement of SPT following RS-RARP is safe and effective and may preserve return of early continence. Further study is warranted.



	SPT (N = 22)	UC (N = 22)	P value
Age (years)	63 ± 6.34	61 ± 5.8	0.32
Race			
Asian	0	2	0.91
African American	10	5	
Caucasian	12	13	
Hispanic	0	2	
BMI	28.2 ± 4.3	24.6 ± 3.7	0.6
Gleason Grade Group (median)	3	3	0.96
Post-operative Complications	0	0	1.0
Console Time	113.6 ± 20	113.2 ± 23	0.75
Positive Margin	7	3	0.13
LOS	1.09 ± 0.3	1.04 ± 0.2	0.56
Baseline EPIC-CP	7.2 ± 6.4	6.9 ± 6.0	0.9
EPIC-CP UI	0 ± 0.45	1 ± 0.92	0.03
6 week EPIC-CP	15.2 ± 6.7	17.3 ± 9.6	0.48
6 week EPIC-CP UI	2.77 ± 2.6	3.5 ± 2.6	0.45
Time to continence (0 pads, days)	13 ± 18.0	37 ± 53.5	0.05
Continence at catheter removal (n, %)	14 (63%)	11 (50%)	0.37

Table 1: Patient demographics.

DP-11

Evaluating Factors Associated with Emergency Department Visits within 30 Days Following Elective Ureteroscopy for Nephrolithiasis

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Introduction and Objective: Ureteroscopy (URS) is a common procedure for definitive treatment of kidney stones; however, there is still variation in preoperative, intraoperative, and postoperative care provided for this procedure. This study evaluated factors associated with unplanned emergency department (ED) visits within 30-days post-ureteroscopy for stones. We attempted to identify dominating factors related to return to the ED and readmission to the hospital following this procedure so that we could potentially institute a plan to decrease unplanned ED visits.

Methods: A retrospective chart review was conducted at an academic tertiary care hospital in rural, central Pennsylvania of patients who had URS for nephrolithiasis from 2017-2019. Electronic medical records were accessed, and we collected data on 37 factors which included patient demographics, past medical history, stone characteristics, and surgical features from each chart. Univariate analyses were used to determine predictors of unplanned ED visits.

Results: Of 404 patients who had ureteroscopy, 51 patients (12.6%) made ED visits within 30 days of the procedure; there was no statistical significance between any of the observed factors and return to the ED on univariate analysis. Use of access sheath, although not statistically significant, was protective against return to the ED. The most common reasons for ED visits were flank pain (35%), fever (18%), dislodged or migrated stent (12%), and abdominal pain (6%). Of those who visited the ED, 26 (51%) were ultimately admitted to the hospital for various reasons.

Conclusions: No single factor predicted ED visits following URS on univariate analyses. Preoperative patient education about expectations following URS and ensuring adequate pain control may decrease ED visits following URS.

DP-12

Utilization of Ambulatory Surgery Center and Acute Management Pathway to Improve Stone Treatment Time

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Introduction and Objective: Patients with acute renal stone disease often have lengthy wait times from emergency department (ED) to urologist to definitive treatment. Along with this increased wait time comes return ED visits due to pain, which become costly and inconvenient. This prompted our team to create a protocol, called Acute Rapid Stone Treatment Pathway or AiRSTRiP, to be used in conjunction with an ambulatory surgery center (ASC) in effort to use a systematic approach to decrease this wait time and lessen the burden associated with renal stone disease.

Methods: We reviewed our database of patients who presented to the ED with renal colic due to a unilateral stone and subsequently underwent lithotripsy or endoscopic procedures after we gained access to an ASC. Data took place dudring an 8-month period from July 2016 to February 2017 using CPT codes. Halfway through the study, we introduced the AiRSTRiP protocol into our large urology group practice. Pre and post-pathway data were compared using Student t-test to assess AiRSTRiP's ability to decrease wait time and increase ASC utilization.

Results: Out of 2075 procedures performed on 1485 patients, 228 patients qualified for our study, including 149 in our pre-pathway cohort and 79 in our post-pathway cohort. The average stone sizes for each cohort were 7.13 and 7.05 mm, respectively. Utilization of the ASC increased significantly from 31.5% to 48% following implementation of the pathway ($p = 0.014$). Wait times from initial ED visits to office follow-up were notably reduced from 6.5 to 4.3 days ($p = 0.0319$), while ED to treatment time decreased significantly from 22.5 to 14.2 days ($p = 0.0018$).

Conclusions: We have demonstrated for the first time that implementation of a stone management pathway, in combination with access to an ASC, can significantly reduce wait time for follow-up and definitive treatment for stone disease.

DP-13

4 Week Virtual Urology Course Focused on Teaching Non-Urology Students

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Introduction and Objective: Medical student exposure to urology has traditionally been limited to students planning to specialize in the field. During COVID-19 pandemic, interest increased on online courses providing exposure specialized fields. Our four-week discussion and case-based urology course, guided by the American Urology Association medical student curriculum, was created to cover high-yield topics for fourth year students and has been primarily taken by students who are not planning to specialize in urology or "non-intended students". We aimed to determine if our online course provided sufficient exposure to urology for non-intended students.

Methods: A 24-question survey was emailed to 15 non-intended students enrolled in Jefferson's URO430 course over a 5-month period. The survey sought to determine overall satisfaction, perceived usefulness of the course, and specific feedback for the course.

Results: A total of 11 students (73%) completed the survey. 64% of respondents were female and 45% were applying to a procedural specialty. 91% of students had no urology exposure during their clinical curriculum. The average reported time on the course was 15 hours per week. 100% of respondents agreed that they gained a lot from the course and that it would help them in residency. Mean overall satisfaction was 9.4 on 1-10 scale. 10/11 agreed that discussion boards and online lectures were useful.

Conclusions: URO430 was an unexpected positive outcome of virtual learning and provided exposure to non-intended students. Moreover, URO430 has doubled the number of students taking a urology course at our institution. All surveyed found our course to be useful and believed that it would help them during residency. In a final testament to its success, it will be included in the curriculum for next year. We believe that a virtual course in urology is an excellent way to expose students to our specialty in a curriculum that does not otherwise have that capacity.

DP-14

Trends in Hospital Opioid Use after Urological Trauma

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Introduction and Objective: Following trauma, increased opioid use is associated with inferior outcomes and increased risk of opioid dependence, particularly in vulnerable populations. In contrast, multimodal analgesia following trauma results in decreased pain and readmission. Currently there is a paucity of data describing opioid usage following urological trauma. We assess utilization of opioids and multimodal pain regimens following urologic trauma.

Methods: We retrospectively examined 121 patients hospitalized following urologic trauma from 2016-2021. Inpatient and discharge utilization of opioids, multimodal analgesia and length of stay were stratified by affected organ. Analyses were performed in STATA with $p<0.05$ reaching significance.

Results: 121 patients were assessed; affected organ and mechanism of injury are shown in Table 1A. Displayed in Figure 1, though differences in average opioid morphine equivalence (OMEQ) per day are not significant ($p = 0.368$), bladder injuries incurred higher mean OMEQ than other urological injuries with 14 (88%) requiring surgery and 8 (50%) associated with pelvic fracture. ISS's were significantly different between trauma groups ($p=0.011$) with multiorgan trauma having the highest average. In nearly all groups, OMEQ prescribed at discharge is less than average inpatient OMEQ. Shown in Table 1B, 87 (73%) patients were given acetaminophen in the hospital, but only 12 (10%) used non-opioid NSAIDs despite significantly lower average OMEQ prescriptions per day with acetaminophen use ($p = 0.009$).

Conclusions: Multimodal analgesia is severely underutilized following urological trauma. Combined with the development of opioid tolerance over long hospital stays, this creates an avenue for opioid misuse following discharge and opportunities for improvement.

Figure 1. Opioid Use in First 10 Days of Hospitalization and at Discharge

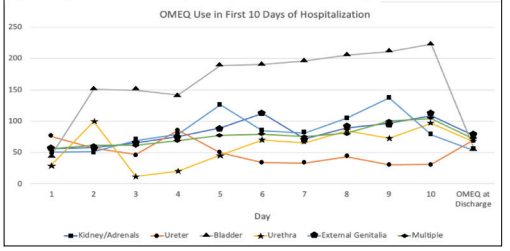

Table 1A. Cohort Demographics

Characteristic	Total	N (%) GU Organ Injured						
		Kidney/ Adrenals	Ureter	Bladder	Urethra	External Genitalia	Multiple	p-value
Number of Patients	121	67 (55%)	4 (3%)	16 (29%)	2 (2%)	15 (12%)	17 (14%)	
Mean Age at Time of Injury	34.7	34.8	38.5	43.9	27.5	26.7	32.9	
Mean Injury Severity Score	20.60	21.84	22.75	16.25	30	11.43	25.94	0.0114
Sex								0.137
Male	104	55 (53%)	3 (3%)	12 (12%)	2 (2%)	15 (14%)	17 (16%)	
Female	17	12 (71%)	1 (6%)	4 (24%)	0 (0%)	0 (0%)	0 (0%)	
Race								0.05
White	23	14 (61%)	0 (0%)	5 (22%)	1 (43%)	0 (0%)	3 (13%)	
Black	92	50 (54%)	4 (4%)	10 (11%)	0 (0%)	14 (15%)	14 (15%)	
Other	6	3 (50%)	0 (0%)	1 (17%)	1 (17%)	1 (17%)	0 (0%)	
Mean Length of Hospital Stay	12.4	11.7	28.3	9.0	8.5	7.6	19.1	
Mechanism of Injury								0.063
GSW	60	25 (42%)	3 (5%)	8 (13%)	1 (2%)	11 (18%)	12 (20%)	
MVC	34	18 (53%)	0 (0%)	7 (21%)	1 (3%)	3 (9%)	5 (15%)	
Fall	12	11 (92%)	1 (8%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Other	15	13 (87%)	0 (0%)	1 (7%)	0 (0%)	1 (7%)	0 (0%)	
Required Surgery?								0.029
Yes	88	41 (47%)	4 (5%)	14 (16%)	2 (2%)	11 (13%)	16 (18%)	
No	33	26 (79%)	0 (0%)	2 (6%)	0 (0%)	4 (12%)	1 (3%)	

Table 1B. Opioid Use Stratified by Urological Injury

Characteristic	Total	N (%) GU Organ Injured					
		External Genitalia	Kidney/ Adrenal	Ureter	Bladder	Urethra	Multiple	p-value
Opioid prescribing pattern	-	-	-	-	-	-	-	-
Oxycodone	90 (76%)	10 (11%)	46 (51%)	4 (4%)	12 (13%)	2 (2%)	16 (18%)	-
Hydromorphone	90 (76%)	9 (10%)	44 (49%)	4 (4%)	11 (12%)	2 (2%)	10 (11%)	-
Fentanyl	87 (73%)	13 (15%)	46 (53%)	4 (5%)	11 (13%)	2 (2%)	11 (13%)	-
Tramadol	9 (8%)	1 (11%)	4 (44%)	2 (22%)	0 (0%)	0 (0%)	2 (22%)	-
Other	19 (16%)	1 (5%)	11 (58%)	0 (0%)	4 (21%)	1 (5%)	2 (11%)	-

DP-15

Preoperative Predictors of Surgical Success for Robotic Ureteral Reconstruction of Proximal and Middle Ureteral Strictures

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Introduction and Objective: We investigate predictors of surgical success for patients undergoing robotic ureteral reconstruction (RUR) for proximal and middle ureteral stricture disease.

Methods: We retrospectively reviewed our multi-institutional Collaborative of Reconstructive Robotic Ureteral Surgery (CORRUS) database to identify all consecutive patients undergoing RUR for proximal and/or middle ureteral stricture disease between 04/2012-01/2019. The specific reconstruction technique was determined by the primary surgeon based on clinical history and intraoperative findings. Patients were grouped according to whether or not they were surgical successful. Preoperative variables between both groups were compared using chi-square tests. All independent variables with associations of $p<0.2$ then underwent a binary logistic regression analysis to determine predictive variables of success for RUR ($p\leq0.05$ was considered statistically significant).

Results: Overall, 228 patients met inclusion criteria. Univariate analysis (Table 1) showed that there were a lower proportion of patients with diabetes (8.5% versus 29.6%, $p<0.01$) and a higher proportion of patients who underwent ureteral rest (84.5% versus 63.0%, $p=0.01$) in the surgical success group. Multivariate logistic regression analysis (Table 2) further revealed that patients with diabetes were 3.74 times more at risk ($p=0.01$, CI: 1.35-10.37) of failing to achieve surgical success compared to those without diabetes. Patients undergoing ureteral rest prior to RUR were 2.68 times more likely ($p=0.04$, CI: 1.05-6.82) to achieve surgical success compared to those who did not undergo ureteral rest.

Conclusions: In patients undergoing RUR for management of proximal and middle ureteral strictures, preoperative factors such as the absence of diabetes and the implementation of ureteral rest may optimize surgical outcomes.

Table 1: Univariate Analysis of Predictors of Success for RUR

Variable	Success (n=201)	No Success (n=27)	p-value
Male gender (%)	49 (24.3%)	10 (37.0%)	0.16
Obesity (%)	94 (46.8%)	10 (37.0%)	0.34
History of smoking (%)	112 (55.7%)	13 (48.1%)	0.46
History of abdominal surgery (excluding ureteral surgery) (%)	86 (42.8%)	16 (59.3%)	0.11
Active medical conditions			
Cardiovascular disease (%)	17 (8.5%)	1 (3.7%)	0.39
Diabetes (%)	17 (8.5%)	8 (29.6%)	<0.01
Immunocompromised state (%)	6 (3.0%)	1 (3.7%)	0.839
Crohn's disease (%)	3 (1.5%)	0 (0.0%)	0.52
Neurogenic bladder (%)	1 (0.5%)	0 (0.0%)	0.71
Prior ureteral stricture intervention (%)	46 (22.9%)	7 (25.9%)	0.73
Ureteral rest (%)	170 (84.5%)	17 (63.0%)	0.01
Long stricture (>2.5 centimeter) length (%)	38 (18.9%)	8 (29.6%)	0.19

Table 2: Multivariate Analysis of Predictors of Success for RUR

Variable	p-value	Odds Ratio	Confidence Interval
Male gender	0.29	0.61	0.24-1.52
History of abdominal surgery (excluding ureteral surgery)	0.43	0.70	0.28-1.72
Diabetes	0.01	0.27	0.10-0.74
Ureteral Rest	0.04	2.68	1.05-6.82
Long stricture (>2.5 centimeter) length	0.99	0.99	0.36-2.79

DP-16

Shear Wave Elastography: Novel Methods for the Evaluation of Urethral Stricture Disease

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Introduction and Objective: Shear wave elastography (SWE) is a technique for measuring tissue stiffness noninvasively and may be utilized to evaluate spongiofibrosis. We examined the utility of SWE for the evaluation of urethral stricture disease.

Methods: Patients with a single, bulbar urethral stricture were prospectively recruited from October 2018 to October 2020. SWE was performed at the time of surgical repair and at 4 months follow-up using an Aplio i800 scanner (Canon Medical Systems, Tustin, CA) with an i8CX1 transducer. Upon imaging acquisition, four regions of interest were placed on the corpus spongiosum – both ventrally and dorsally at the level of the stricture and adjacent to the stricture in healthy tissue (Figure 1). Tissue stiffness (in kPa) was averaged across the corresponding ROIs in 3 separate images for each patient. SWE data were analyzed using paired student's t-tests.

Results: Thirty men were enrolled. Pre-operatively, tissue stiffness of the corpus spongiosum was greater at the level of the stricture (32.6±5.4 kPa vs. 27.3±3.8 kPa, $p=0.04$). and in narrower (<5 Fr) strictures (48.1±6.6 kPa vs. 26.5±4.8 kPa, $p=0.04$), but did not differ by stricture length ($p=0.18$). Post-operative tissue was less stiff than pre-operative measurements at both the stricture (19.4±3.2 kPa vs. 32.6±5.4 kPa, $p<0.001$) and non-strictured areas (20.0±2.8 kPa vs. 27.3±3.8 kPa, $p=0.007$). Pre-operatively, stricture stiffness was not a predictor for recurrence (5/15; recurrence, 32.7±5.3 kPa vs. 10/15; no recurrence, 29.2±5.0 kPa, $p=0.6$). Tissue stiffness post-operatively was greater in patients who underwent excision and primary anastomosis vs. non-transecting and buccal graft urethroplasty (14/28; 26.5±4.0 kPa vs. 13/28; 8.8±1.2 kPa, $p<0.001$).

Conclusions: SWE may be a useful complement to conventional ultrasound in the initial characterization and post-operative follow-up of urethral stricture disease.

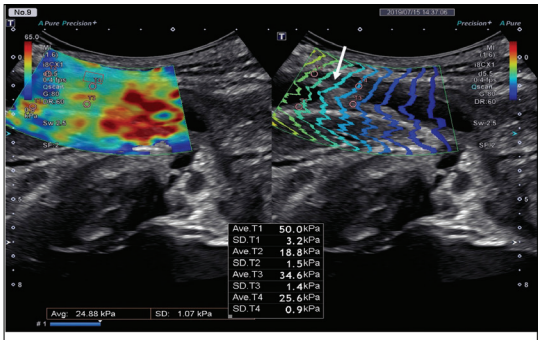

Figure 1: A mid-bulbar urethral stricture (arrow) identified with 2D grayscale ultrasonography. Four regions of interest plotted on the corpus spongiosum – both ventrally and dorsally at the level of the urethral stricture and adjacent to the stricture in healthy tissue.

DP-17

Utilizing da Vinci ® Robotic Surgical System to treat Distal Ureteral Cancer, Functional and Oncological Outcome

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Introduction and Objective: Nephroureterectomy used to be the classical treatment for transitional cell carcinoma (TCC) affecting the distal ureter. Contemporary reports demonstrate equal oncologic outcome for distal ureterectomy when compared to nephroureterectomy. However, the distal ureterectomy showed better renal functional outcome. Distal ureterectomy necessitates ureteral reimplantation or substitution, and both traditionally required large midline or Gibson incision. In this study, we are reporting on the functional and oncologic outcomes of alternatively utilizing a minimally invasive technique to treat distal ureter TCC via the da Vinci® robotic surgical system.

Methods: We retrospectively collected the data of 20 patients with distal ureteral TCC, who presented to our department for treatment between September 2009 and February 2020. We utilized the da Vinci® robotic surgical system to perform distal ureterectomy and ureteral reimplantation or substitution with Boari flap. The distal ureter was excised with the bladder cuff and pelvic lymph node dissection was performed. The proximal ureteral end was spatulated and re-implanted either directly to the bladder or after developing a Boari flap as needed to ensure tension-free, leak-proof anastomosis. Negative margins for invasive TCC was achieved in all cases.

Results: The average patient age was 73 years (ranging from 55-82). Of the 20 patients, 14 were male and 6 female. All cases were completed robotically. The patients were followed for an average of 38.4 months (ranging from 3 months to 84 months). Four patients (20%) who had lower ureteral TCC developed ureterovesical anastomosis stricture, all except one of which had high grade TCC.

Conclusions: Robotic distal ureterectomy with lymph node dissection and ureteral reimplantation/substitution with Boari flap is an effective minimally invasive alternative with good functional and oncologic outcomes. Longer follow-up is needed.

Patient	Age	Sex	Pathology	Creatinine Clearance	Tumor Stage	lymph node	recurrence	follow up	time to stricture/recurrence	Reimplant/ substitution
1	56	male	high G	69	T3 N0	N0	Free	84		Boari
2	71	male	low G	59	T1 N0	N0	Free	48		Boari Flap
3	82	male	high G	46	T1 N0	N0	Free	62		Boari Flap
4	76	female	low G	70	T1 N0	N0	recurrence	45	12	Boari Flap
5	74	male	high G	64	T1 N0	N0	Free	65		Boari Flap
6	66	male	low G	62	T1 N0	N0	Free	40		Boari Flap
7	59	male	low G	83	T1 N0	N0	Free	22		Reimplant
8	76	male	high G	38	T3 N0	N1	recurrence	50	28	Boari Flap
9	73	male	low G	66	T1 N0	N0	Free	45		Boari Flap
10	79	male	high G	55	T2 N0	N2	recurrence	44	36	Boari Flap
11	80	female	high G	60	T1 N0	N0	Free	40		Boari Flap
12	75	male	low G	48	T1 N0	N0	Free	37		reimplant
13	69	female	low G	52	T1 N0	N0	recurrence	35		Boari Flap
14	67	female	high G	62	T2 N0	N0	Free	31		Boari Flap
15	74	male	low G	70	T1 N0	N0	Free	30		Boari Flap
16	75	male	high G	29	T3 N1	N2	recurrence	28	18	Boari Flap
17	63	male	low G	53	T1 N0	N0	Free	24		Boari Flap
18	78	female	low G	47	T1 N0	N0	Free	18		Boari Flap
19	82	female	high G	57	T3 N1	N1	Free	12		Boari Flap
20	78	male	low G	70	T1 N0	N0	Free	8		reimplant

DP-18

The Social Impact of Surgery for Nephrolithiasis: Results from the Endourological Society TOWER Research Collaborative

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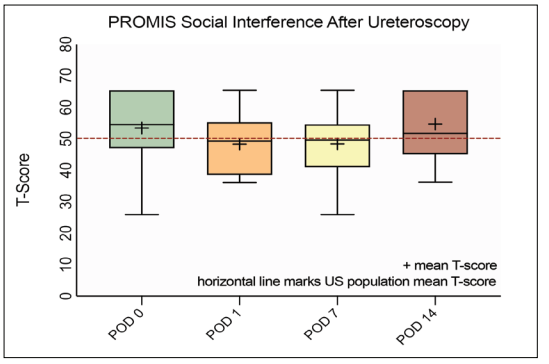
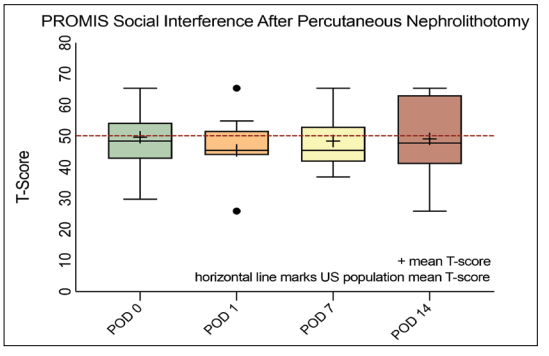
Introduction and Objective: Nephrolithiasis is among the most common urological conditions; however, the social impact of the disease remains significantly understudied, particularly following surgical intervention. We prospectively captured patient-reported ability to participate in social roles and activities in patients following ureteroscopy (URS) or percutaneous nephrolithotomy (PCNL) for nephrolithiasis.

Methods: Adults undergoing URS or PCNL for renal/ureteral stones were eligible for inclusion (10/2020-3/2021). Patients prospectively completed PROMIS-Ability to participate in social roles and activities instrument pre-operatively (POD 0) and via email on POD 1, 7, and 14. Scores are reported as T-scores (normalized to US pop., mean=50) with a change of 5 (0.5 SD) considered clinically significant.

Results: A total of 68 patients completed enrollment at POD 0 (POD 1=40, POD 7=39, POD 14=32). For the overall cohort, there was a clinically and statistically significant difference in scores over each subsequent time comparison (repeated measures ANOVA; $p < 0.001$). Repeated measures ANOVA show statistically significant difference in scores between POD 0 and 1 and between POD 7 and 14 for URS patients (Figure 1; $p < 0.001$), but not PCNL patients (Figure 2). URS patients return to baseline social participation by POD 14, and PCNL patients return to baseline by POD 7.

Conclusions: Ability to participate in social roles and activities declines immediately post-operatively. PCNL patients see normalization in social participation by POD 7, but PCNL patients experience social interference for longer and return to baseline by 14 days. Results offer meaningful insight to assist counseling patients for surgical treatment of nephrolithiasis.





DP-19

Widening of Socioeconomic Disparities After the USPSTF's 2012 Prostate-Specific Antigen-Based Prostate Cancer Screening Recommendation

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Introduction and Objective: In 2012, the U.S. Preventive Services Task Force (USPSTF) recommended against prostate-specific antigen (PSA)-based screening for prostate cancer. Previous studies have found that patients of higher socioeconomic status with prostate cancer have better outcomes than those with lower socioeconomic status. In this study, we examined the recommendation's effects on survival disparities based on socioeconomic, marital, and housing status.

Methods: Using the SEER 18 database, we examined prostate cancer-specific survival (PCSS) based on diagnostic time period (2010-2012 for pre-USPSTF era and 2014-2016 for post) and one of three factors: socioeconomic quintile, marital status, and housing (urban/rural). The SEER-designated socioeconomic quintile was based on variables including median household income, rent, and education index. PCSS was measured with the Kaplan-Meier method, while disparities were measured with Cox proportional hazards model.

Results: During the pre-USPSTF era, patients in the lowest socioeconomic quintile experienced worse PCSS compared to those in the highest quintile (Table 1; adjusted HR 1.44, 95%CI 1.25-1.67, p<0.01). This survival disparity narrowed during the post-USPSTF era as result of disproportionately decreased PCSS among patients in the lowest quintile (Fig 1; aHR 1.38, 95%CI 1.13-1.69, p<0.01). In contrast, the survival disparity based on marital status widened, while housing status was not associated with survival disparities in either era.

Conclusions: From the pre- to post-USPSTF era, the survival disparity among patients based on socioeconomic quintile narrowed, suggesting that the 2012 PSA screening recommendation may have disproportionately hindered patients in the highest socioeconomic quintile from being regularly screened for prostate cancer.

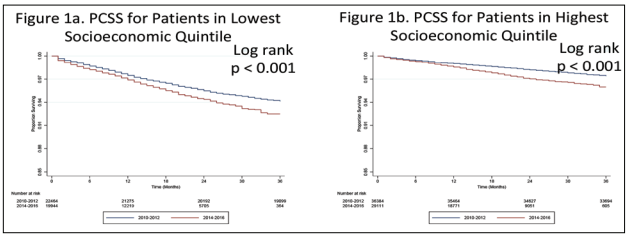

Table 1. Cox Proportional Hazards Model of Socioeconomic Factors Associated with Prostate Cancer Cause-Specific Survival in the Pre-USPSTF and Post-USPSTF Eras

	Pre-USPSTF Era (2010 – 2012)		Post-USPSTF Era (2014 – 2016)	
Socioeconomic Status Quintile	**Adjusted Hazard Ratio (95% CI)**	***p*-value**	**Adjusted Hazard Ratio (95% CI)**	***p*-value**
Highest Quintile	1 (Referent)		1 (Referent)	
Lowest Quintile	1.443 (1.248 – 1.669)	< 0.001	1.382 (1.129 – 1.692)	0.002
Housing				
Urban	1 (Referent)		1 (Referent)	
Rural	1.014 (0.883 – 1.165)	0.841	1.160 (0.964 – 1.397)	0.116
Marital Status				
Married	1 (Referent)		1 (Referent)	
Unmarried	1.163 (1.066 – 1.268)	0.001	1.452 (1.288 – 1.638)	< 0.001

DP-20

Same-Day Discharge and Post-discharge Outcomes after Robot-assisted Radical Prostatectomy

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Introduction and Objective: Several high-volume centers have reported their institutional experience on same-day discharge after robot-assisted radical prostatectomy (RARP). There is still limited data available on the risk of readmission and post-discharge complications after RARP at the national level.

Methods: Patients who underwent RARP for prostate cancer were identified from the 2012-2019 National Surgical Quality Improvement Program (NSQIP) database. Patients were stratified into two groups: those who were discharged the day of surgery (same-day discharge, SDD) and those who were discharged on postoperative day 1 (routine discharge, RD). Outcomes of interest included any post-discharge complications, major post-discharge complications, and unplanned readmission within 30 days of surgery.

Results: A total of 41,076 patients (SDD=532, RD=40,544) were included. Overall post-discharge complication rate in the cohort was 3.8% and major post-discharge complication rate was 2.1%. The unplanned readmission rate was 3.2%. Unadjusted analyses showed no significant differences in any post-discharge complications, major post-discharge complications, or unplanned readmission between the two groups (Figure). There were also no significant differences in individual complications between the two groups. Multivariable logistic regression showed that compared with RD, SDD was not associated with increased odds of any post-discharge complications (odds ratio [OR]=1.16, 95% confidence interval [CI]=0.76-1.75, P= 0.493), any post-discharge major complications (OR=1.05, 95%CI=0.59-1.87, P=0.862), or readmission (OR=0.75, 95%CI=0.43-1.31, P= 0.309).

Conclusions: Our study adds to the literature showing that SDD after RARP for selected patients is safe and is not associated with increased risks of post-discharge adverse outcomes. Further efforts are needed to identify patients that are candidates for SDD so to decrease health care costs.