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Northeastern Section of the American Urological Association 73rd Annual Meeting Abstracts

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Basic Science

Poster #2

Protein disulfide isomerase in extracellular vesicles drive malignant transformation in bladder cancer tumor microenvironment

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Introduction: Non-muscle invasive bladder cancer (NMIBC) exhibits a high recurrence rate and tumor multifocality, placing significant financial and psychological burden on patients. Extracellular vesicles (EVs) are membrane-bound nano-particles containing bioactive molecules critical for intercellular communication. Recent studies provide evidence that bladder cancer EVs (BCEVs) promote the malignant transformation of predisposed cells by activating the oncogenic ER stress response. We sought to identify responsible cargo proteins and underlying mechanisms that drive tumorigenesis.

Methods: Mass spectrometry was used to identify the candidate EV protein: protein disulfide isomerase (PDI). Loss/gain-of-function approaches were applied to define the functional roles of EV-borne PDI. Various assays including Western blot, DCFDA, immunofluorescence staining, and colony-forming assay were performed to characterize cellular molecular alterations during transformation. Whole-genome sequencing (WGS) analysis was performed to assess the mutations in the transformed cells. Urinary EVs isolated from NMIBC patients were analyzed for the presence of PDI.

Results: EV-borne PDI, a redox chaperone of ER, was identified for its exclusive and abundant presence in BCEVs. Treating normal urothelial SV-HUC cells with PDI-enriched BCEVs increased cellular oxidative stress and DNA damage. Knock down of PDI in BCEVs reduced cellular ROS and DNA damage, suppressing tumorigenesis in SV-HUC recipient cells. Restoring PDI by extrusion rescues tumorigenic phenotypes. In transformed cells, WGS identified 114,978 unique variants and 875 genes harboring mutations in coding regions. Importantly, several of these genes are tumor suppressors, negative regulators of cell proliferation, and regulators of apoptosis- essential alterations described as seminal hallmarks of cancer. PDI was detectable in urinary EVs derived from NMIBC patients, making PDI a viable candidate marker for liquid biopsy.

Conclusions: This supports a model wherein PDI-enriched EVs induce cellular stress responses in recipient normal urothelial cells and promote mutational events. Accumulation of somatic mutations facilitates the selection for cells that gain a survival advantage and eventually evolve into fully transformed malignant cells. This study offers a potential therapeutic target in BCEVs to prevent BC recurrence. PDI detection in urinary EVs may provide a novel noninvasive biomarker for NMIBC recurrence.

Funding: NCI R01 CA173986.

Poster #3

Sustained plasminogen activator inhibitor-1 (PAI-1) expression during obstructive uropathy promotes glycolytic reprogramming and renal fibrosis via Rac-GTPase dependent mechanisms

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Introduction: Some patients with obstructive uropathy develop fibrosis and chronic kidney disease (CKD), which affects more than 850 million people worldwide. PAI-1 is a causative factor in the progression of obstructive uropathy to CKD, but the pathophysiological basis is not well understood. Metabolic alterations were recently identified as a key contributor to the progression of fibrosis. While upstream controls are not fully elucidated, increased glycolysis has emerged as an important factor in obstructive nephropathies. Glycolysis is a multi-step reaction, which converts glucose to pyruvate, generating energy. This is orchestrated by three enzymes that catalyze irreversible steps in the pathway: hexokinase-1 (HK-1), phosphofructokinase-1 (PFK-1), and pyruvate kinase M2 (PKM2). PAI-1 expression is robustly induced in renal tubules and interstitial cells during various nephropathies, including obstructive uropathy, in both humans and mice. Involvement of PAI-1 in renal metabolic alterations has not been well characterized. Therefore, we tested the hypothesis that renal tubular PAI-1 induction promotes glycolytic reprogramming during fibrosis.

Methods: To mimic the sustained renal tubular PAI-1 induction seen in CKD, we stably expressed PAI-1 (driven by a CMV promoter) via lentiviral transduction in HK-2 renal epithelial cells (referred to as CMV-PAI-1 cells). We selected with puromycin to ensure stable expression. We used Western blot analysis to confirm PAI-1 expression and compare the expression of glycolytic enzymes and fibrotic markers in CMV-PAI cultures and empty vector transduced HK-2 cells (CMV-Control cultures). We used unilateral ureteral obstruction (UUO), a mouse model, which mimics obstructive uropathy to further investigate the relationship between PAI-1 and glycolysis.

Results: PAI-1 stably expressing renal epithelial cells undergo dedifferentiation (evident by loss of the epithelial marker E-Cadherin and gain of the mesenchymal marker vimentin) and spontaneous fibrogenesis (marked by increased fibronectin and collagen-1 expression) relative to CMV-Control cells, which maintain epithelial properties. Expression of HK-1, PFK-1, and PKM2 is also robustly induced in CMV-PAI-1 cultures compared to control transductants. In vivo, robust PAI-1 induction correlated with increased glycolytic enzyme expression in mice subjected to ureteral obstruction relative to sham or contralateral kidneys. Mechanistically, sustained PAI-1 expression leads to induction of Rac1b, a constitutively active isoform of Rac1-GTPase. Treatment with a specific Rac-GTPase inhibitor, EHT-1684, not only dramatically decreases Rac1b expression and fibrotic phenotype, but also attenuates glycolytic enzyme induction compared to vehicle-treated CMV-PAI-1 cultures.

Conclusions: PAI-1 stable expression leads to increased glycolytic reprogramming and fibrogenesis via Rac1-dependent pathways.

Funding: National Institute of Health, Capital Region Medical Research Institute.

Poster #4

THX-B compound decreases the activity of matrix metalloproteinase-9 and increases secretion of nerve growth factor by mouse urothelial cells in culture

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Introduction: Low levels of nerve growth factor (NGF) have been observed in the urine of patients with overactive bladder syndrome (OAB) and of diabetic rodents. This unbalance appeared to result from a high activity of the proteolytic enzyme metalloproteinase-9 (MMP-9). On the other hand, THX-B, an inhibitor of p75NTR, restored normal levels of NGF in mice with type 1 diabetes. We here examine in vitro the effect of THX-B on the activity of MMP-9 in bladder cells.

Methods: Primary culture of urothelial and smooth muscle cells (SMCs) were grown from mouse bladder. The expression of NGF and MMP-9 were assessed by RT-qPCR, immunohistochemistry, and immunoblotting. Levels of microRNAs were measured by RT-qPCR. NGF and proNGF secretion were measured by ELISA kits and MMP-9 activity by enzymatic assays.

Results: The mRNAs for NGF and MMP-9 were detected and found expressed in both cell types at a similar level. Microscopy confirmed the localization of both proteins in cells. Urothelial cells were the major source of NGF and proNGF while SMCs produce only a limited amount. On the other hand, MMP-9 protein content was 7 times higher in SMCs than in urothelial cells, which was confirmed by high levels of miR-491-5p in the latter. However, secretion of active MMP-9 in the medium was 40 times higher in urothelial cells. Incubation with THX-B (5 µg/mL) for 24 hours abolished the synthesis and secretion of MMP-9 and doubled the concentration of NGF in the medium of urothelial cells. ProNGF secretion levels were not affected. THX-B had little effects on SMCs both at the level of NGF and MMP-9.
Conclusions: Urothelial cells secrete most of NGF, proNGF and MMP-9 in the bladder tissue. As well, these cells appear to be the primary target for THX-B. These results are in accordance with our previous publications on OAB patients and type 1 diabetes in rodents and suggest that THX-B could be a therapeutic tool to improve OAB by targeting primarily the urothelium.
Funding: Canadian Urological Association.

Poster #5

A new model of healthy aging to study bladder diseases, the LOU rat

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Introduction: Aging is associated with the development of urological diseases. Using a rodent model of healthy aging (the LOU rat), we examined the effect of partial urethral obstruction (PUO) on bladder structure and contractile properties and on proteins involved in contraction. We also examined NGF, proNGF, receptor p75NTR and acetylcholine vesicles to assess changes in the nerve endings inside the bladder wall.
Methods: LOU rats aged six or 36 months were subjected to partial bladder urethral obstruction (PUO) and kept for two weeks. Cystometry was then carried out followed by an in vitro assessment of muscle strip contractile characteristics (organ bath). Tissue proteins were examined by immunoblotting and light microscopy (Masson trichrome and hematoxylin-eosin).
Results: PUO increases significantly the ratio bladder mass/body weight with increased thickness and fibrosis of the bladder wall. Cystometry parameters were unchanged by PUO in old rats while in young rats, inter-micturition intervals, micturition volume and bladder capacity were increased. Contractile properties of bladder strip in vitro were not affected by age or PUO, which was related to an increase in smoothelin content, a protein essential to proper contraction. On the other hand, levels of smooth muscle myosin heavy chain 1 (SMMHC1), alpha- and beta- actin and connexin 43 were unchanged. E-cadherin, a junction protein essential in cell proliferation, was increased by PUO only in old rats. CK17 expression, an index of urothelial integrity, was similar between groups. Finally, the ratio NGF/proNGF, a marker of OAB was decreased with PUO in both groups of animals, with decreased expression of p75NTR and stable expression of its cofactor sortilin. On the contrary, VACht was unchanged by PUO.
Conclusions: Young LOU rat bladders appear to fully adapt to PUO to maintain efficient bladder contractility while old ones gradually lose this ability. The young LOU rats, given its ability to withstand PUO, might constitute a new model to study the effect of age and the evolution of diseases affecting the bladder.
Funding: RQRV (Quebec Network for the research on aging).

Poster #6

Macrophage re-education in prostate cancer: Subversion of inflammatory macrophages to a mixed immunosuppressive tumor-associated macrophage phenotype

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Introduction: Tumor-associated macrophages (TAMs) are known to influence the tumor microenvironment (TME) supporting tumor progression. TAMs are versatile cells implicated in different immune functions influenced by local factors, whether immune-stimulatory or immunosuppressive. Many questions remain as to the origin, development, and function of TAMs within the prostate TME. To understand the origin of this population, we analyzed phenotypical and functional aspects of human macrophages using analysis of radical prostatectomy specimens and in vitro co-culture models of macrophages and prostate cancer cells.
Methods: Tumor infiltration by the immunosuppressive CD163+ TAMs was analyzed by immunohistochemistry (IHC) in a cohort of 98 patients with locally advanced PCa and long clinical follow-up. Biopsies taken in tumoral and non-tumoral zones of surgically removed prostates (radical prostatectomy specimens) were cultured ex vivo for 72 h, followed by cellular dissociation and flow cytometry analyses for a panel of macrophage markers. Human peripheral blood mononuclear cells were used to derive inflammatory (M1) or immunosuppressive (M2) macrophages, which were co-culture with human prostate cancer cells, to evaluate the effect of tumor cells on the macrophage phenotype.
Results: IHC studies identified CD163+ macrophages in tumor-adjacent normal epithelium, but not in tumoral regions, as a significant predictor of the development of metastases or PCa death. Flow cytometry analyses of radical prostatectomy specimens identified TAMs as frequently expressing both pro-inflammatory M1 (CCR7+) and immunosuppressive M2 (CD163+) markers. We show that prostate cancer cells subvert M1 macrophages into M2 macrophages by loss of function and up-regulation of CD163 marker. Further, we observed that the milieu-induced transition between immunosuppressive M2 to pro-inflammatory M1 macrophages is abrogated by the presence of PCa cells. Using RNA sequencing, we show that human macrophages subverted by PCa cells show alterations in the chemokine network which may recapitulate TAMs characteristics.
Conclusions: Together, our results suggest that prostate TAMs originate from inflammatory infiltrating macrophages, which are then reprogrammed mainly by PCa cells, but also the cytokine milieu. A better understanding of this subversion of macrophages within the prostate may lead to novel treatment strategies.
Funding: Cancer Research Society, Fonds de recherche Québec-Santé.

Poster #7

Exposure to tailorable silver-containing biomaterials developed for the urinary system creates non cultivatable bacteria killing "zombie" cells

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Introduction: Ureteral catheter stents are commonly used in urologic practice and often become colonized with bacteria and encrusted with inorganic salts, leading to complications including urinary infections and obstruction. These adverse effects have a large impact on patients' quality of life and are a burden upon health systems. There have been attempts to embed materials with anti-infective properties without sustained success.

Methods: A novel composite material with ion exchange technologies created by blending silicone rubber with a low concentration of a proprietary silver (Ag+) organic additive was evaluated by plate, static and flow-based liquid systems, cytotoxicity by bladder and kidney cell lines, and by an animal bladder model.
Results: The test material showed potent inhibitory activity against all uropathogenic bacteria tested in the in vitro models. The test and control material did not exhibit any observable cytotoxic effects when tested with cell lines. The 7-day rabbit urinary model exposed to a high dose of E. coli WE 6963 showed that the deposited material was well tolerated and consistently reduced bacterial load. Further in in vitro experiments using retrieved non-viable cells from cultures treated with test material, only bacteria directly exposed to the test material were killed. These cells were inhibitory when transferred to fresh culture, which indicated microbial localising abilities.
Conclusions: This study shows the potential of tailorable ion exchange technologies, when incorporated into urinary system devices, to release antimicrobial when in contact with bacteria in order to combat device associated UTIs. This may offer opportunities to develop tailorable materials with microbe-seeking abilities to eliminate infection or confer other properties on reservoirs beyond a placed device and reduce the reliance on systemic antibiotic use.
Funding: United States Department of Defense.

Best Practices and Benign Disease

Poster #8

The association of new onset diabetes and medical therapy for benign prostatic hyperplasia

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Introduction: Long-term medical management of benign prostatic hyperplasia (BPH) includes use of 5-alpha reductase inhibitors (5ARI) and alpha-blockers (AB). Studies have demonstrated an increased risk of comorbidities, including cardiac failure and diabetes mellitus with use of these medications, raising safety concerns. This study aims to determine the risk of developing diabetes with the use of AB and 5ARI in combination as well as monotherapy.

Methods: This population-based study used administrative databases to look at men over the age of 66 with a diagnosis of BPH between 2005 and 2015. Men were categorized based on exposure to 5ARI or AB. Primary outcome was new cardiac failure and new diagnosis of diabetes. Variables examined included exposure time to medication, age, and comorbidities and logistic regression was used for statistical analysis.

Results: There was a total 129 223 men with a BPH diagnosis and no prior history of diabetes mellitus. Of these, 6390 were exposed to 5ARI, 39 592 exposed to AB, and 30 545 exposed to combination therapy. There was a statistically significant association with new onset of diabetes mellitus with these medication regimens compared to no medication use. Men treated with combination therapy of 5ARI and AB (OR 1.276, 95% CI 1.226–1.329), 5ARI monotherapy (OR 1.254,; 95% CI 1.168–1.345), or AB monotherapy (OR 1.171, 95% CI 1.127–1.217) all showed increased association. When calculating risk of new diagnosis of diabetes measured from start of therapy, AB had a decreased risk in comparison to 5ARI monotherapy (OR 0.887, 95% CI 0.816–0.966).

Conclusions: In this study, men with a BPH diagnosis and exposed to both 5ARI and AB therapy had an increased association of developing new onset diabetes mellitus when compared to no medication use. In a direct comparison of those that initiated monotherapy, 5ARI was shown to have an increased risk compared to AB.

Funding: This study was supported by the Institute for Clinical Evaluative Sciences (ICES), which is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care (MOHLTC).

Poster #9

Postoperative sick leave in urology: Survey to urologists in Quebec

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Introduction: While the length of postoperative sick leaves prescribed can have major socioeconomical consequences, there are currently no clear recommendations regarding their duration after a specific urologic surgery. The primary objective of our study is to assess the duration of the postoperative sick leave prescribed by urologists in Quebec. The secondary objective is to assess whether the gender, the type of practice and the experience of a surgeon may impact the recommended duration of the sick leave.

Methods: Members of the Quebec Urological Association were sent an online survey in October 2020. The first section of the questionnaire inquired on the respondent's demographics: gender, type of practice (community vs. academic), and number of years of practice. The last section of the questionnaire assessed the sick leave prescribed after six common surgeries: transurethral resection of the prostate (TURP); ureteroscopy (URS); retropubic and trans-obturator mid-urethral sling (RP/TO MUS); scrotal surgeries; laparoscopic renal surgeries; and radical prostatectomies (open, laparoscopic and robotic). The questionnaire was categorized according to work intensity defined by American Social Security Administration.

Results: The survey was sent to the 171 urologists. A total of 74 (43.3%) responded to the online questionnaire. Two thirds of the respondents were men (67.6%). About half of the respondents worked in a community setting (56.8%) and practiced for over 10 years (55.4%). Access to private insurance or anticoagulation did not influence the length of the postoperative sick leaves for 66 (89.2%) and 65 (87.8%) respondents, respectively. For patients considered as physically light workers, respondents with less experience (≤10 years of practice) seemed to prescribe longer sick leaves after laparoscopic renal surgeries (p=0.05) and RP/TO MUS (p=0.01), while they tended to prescribe shorter sick leaves after TURP (p=0.13). Respondents with a high surgical volume of URS (>50 cases per year) appeared to prescribe shorter sick leaves for physically strenuous work (p=0.06). Women prescribed longer sick leaves after laparoscopic renal surgeries (p=0.02).

Conclusions: This study depicts the various discrepancies between urologists regarding the length of postoperative sick leaves. It appears that there is often an association between the years of practice and the length of postoperative sick leaves. Further large scale studies would be valuable as they could allow to explore the rational of the length of sick leaves prescribed more specifically in order to standardize them.

Funding: FMSS.

Poster #10

Clinical, quality of life, and cost-effectiveness outcomes of combination therapy and minimally invasive surgical treatments for benign prostatic hyperplasia

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Introduction: Men with moderate to severe lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH) are often prescribed medical therapy to manage their symptoms. Convective water vapor thermal therapy (WVTT) and prostatic urethral lift (PUL) are minimally invasive surgical treatments as an alternative to medication. This study examined the clinical and patients' quality of life (QOL) benefits as well as long-term cost-effectiveness of generic fixed-dose combination therapy of tamsulosin and dutasteride (CT), WVTT, and PUL for men with moderate to severe BPH.

Methods: A systematic literature review was performed to identify randomized and non-randomized clinical trials of CT, WVTT, and PUL for men with moderate to severe BPH and prostate volume <80 g. We used a random-effects network meta-analysis (NMA) to account for the baseline differences between trials. An Excel-based Markov model was developed to examine the cost-effectiveness of generic CT, WVTT, and PUL at five years from a U.S. Medicare perspective. The effectiveness of each treatment was assessed using quality-adjusted life-years (QALYs), a generic health measure that incorporated the patients' QOL impacted by the index treat-

	Generic CT	WVTT	PUL
Average IPSS improvement at 1 year (SD)	10.3 (7.0)	11.7 (6.7)	10.4 (7.0)
Total cost at 5 years ($)	$8,223	$2,655	$9,580
Treatment cost	$6,522	$1,867	$7,258
Adverse event cost	$87	$16	$394
Follow-up cost	$741	$489	$760
Retreatment cost	$873	$284	$1,168
Total QALY at 5 years (Years)	4.11	4.19	4.14
Incremental cost relative to WVTT	$5,567	-	$6,924
Incremental QALY relative to WVTT	-0.07	-	-0.05
ICER (Cost/QALY) versus WVTT	Dominated	-	Dominated

CT, Fixed-dose combination therapy of tamsulosin and dutasteride; WVTT, Water vapor thermal therapy; PUL, Prostatic urethral lift; SD, Standard deviation; QALY, Quality-adjusted life-year; ICER, Incremental cost-effectiveness ratio

Poster #10. Table 1. Clinical and quality of life benefits and long-term cost-effectiveness of generic CT, MVTT, and PUL.

ment, change in International Prostate Symptom Score (IPSS), adverse events (AE), and retreatment. Procedural and AE-related costs are based on 2021 Medicare reimbursement rates which include a combination of facility and non-facility fees. Medication costs were from 2019 Medicare Part D Drug Spending inflated to 2021 dollars.
Results: The NMA found that after controlling for baseline age and IPSS, WVTT had the greatest IPSS improvement followed by PUL and CT, respectively (Table 1). At five years, WVTT had the greatest QALY compared to PUL and CT. The total costs to Medicare at five years were $9580 for PUL, $8223 for generic CT, and $2655 for WVTT. PUL had the highest index treatment and retreatment costs. Since WVTT was more effective in improving patients' QOL and less costly compared to generic CT and PUL, WVTT was the dominant treatment option for the treatment of BPH.
Conclusions: WVTT was the most cost-effective treatment option for men with BPH compared to PUL and CT while providing clinical and QOL benefits to the patients and cost-savings to Medicare.
Funding: Boston Scientific.

Poster #11

Short-term and long-term cost consequences of five treatment options for U.S. men with moderate to severe benign prostatic hyperplasia

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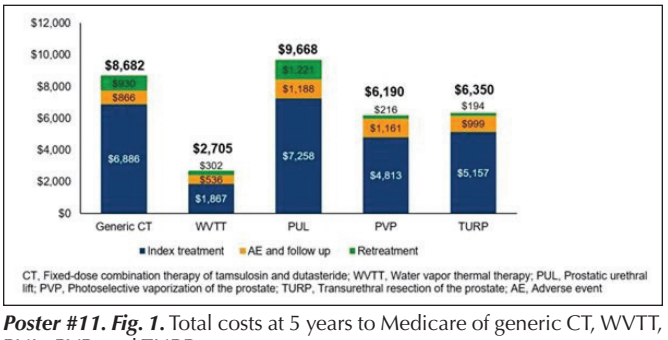
Introduction: Treatment options for men with moderate to severe lower urinary tract symptoms (LUTs) due to benign prostatic hyperplasia (BPH) have variable adverse event (AE) and disease progression profiles that contribute to the healthcare costs. This study examined short-term and long-term cost consequences of generic fixed-dose combination therapy of tamsulosin and dutasteride (CT), convective water vapor thermal therapy (WVTT), prostatic urethral lift (PUL), photoselective vaporization of the prostate (PVP), and transurethral resection of the prostate (TURP) for the treatment of BPH.
Methods: An Excel-based Markov model was developed to examine the cost consequences of generic CT, WVTT, PUL, PVP, and TURP over a period of five years from a U.S. Medicare perspective. Clinical inputs were obtained from a systematic literature review of randomized and non-randomized clinical trials of the five treatments that reported changes in International Prostate Symptom Score (IPSS), AE rates, and retreatment. Since the BPH severity and characteristics of men from different trials are varied, a random-effects network meta-analysis (NMA) with an aggregate regression model was performed to account for the baseline differences. Procedural and AE-related costs are based on 2021 Medicare reimbursement rates which include facility and non-facility fees. Medication costs were from 2019 Medicare Part D Drug Spending inflated to 2021 dollars.
Results: At one year, the total costs were highest for PUL ($8273) followed by TURP ($5861), PVP ($5647), generic CT ($2194), and WVTT ($2019). The main cost driver was the procedural cost of PUL ($7258). A similar pattern was observed from years 2–5. Total Medicare costs at five years for WVTT was lower than PVP (-$3485), TURP (-$3645), CT (-$5977), and PUL (-$6962), making WVTT the cost saving treatment option (Fig. 1). At five years, PUL had the highest retreatment costs followed by CT, WVTT, PVP, and TURP reflecting the lower treatment durability of PUL.
Conclusions: WVTT provided cost-savings to Medicare relative to other commonly used treatments ranging from medical therapy to surgical procedures. WVTT should be considered as a treatment option for men with moderate to severe BPH in a cost-constrained environment.
Funding: Boston Scientific



Poster #11. Fig. 1. Total costs at 5 years to Medicare of generic CT, WVTT, PUL, PVP, and TURP.

Poster #12

Resection of pubic symphysis with cystectomy and urinary diversion significantly improves short-term patient reported physical health measures among patients with urosymphyseal fistula

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Introduction: Fistulization from the urinary tract to the pubic symphysis with resultant osteomyelitis is a devastating complication of prostate cancer treatment. Surgical management with removal of infected bone at time of cystectomy and urinary diversion can cure the associated pain and chronic infection. However, the impact of this surgery on physical and mental function is unknown.
Methods: We identified patients who underwent cystectomy with urinary diversion and pubic symphysectomy for urosymphyseal fistula at our facility. We administered the validated Short Form 12 (SF-12), a questionnaire that generates a physical composite score (PCS) and mental health composite score (MCS) ranging from 0 to 100, preoperatively, and within six months postoperatively. We compared the composite SF-12 scores as well as the difference of this score from the population average for this age group before and after surgery with Student's t-test. We also analyzed a subset of patients who had both preoperative and postoperative scores with a paired T-Test. A p-value of <0.05 was considered statistically significant.
Results: Fifteen patients, with a mean age of 75.3 years at surgery, filled out the SF-12. Twelve and eight men had preoperative and postoperative scores, respectively. All patients had resection of pubic symphysis at time of cystectomy with urinary diversion. The mean PCS preoperatively was 30.19 (mean PCS for 75yo is 39.8) and improved to 41.58 postoperatively ($p=0.01$). There was also a significant improvement in difference between each individual's PCS and the U.S. population average PCS for their age (-10.64, -0.1375; $p=0.01$). The mean MCS preoperatively was 45.00 (mean MCS for 75yo is 48.9), and improved to 52.2 postoperatively ($p=0.13$). The average difference between MCS and US population average adjusted for age was -4.58 preoperatively and 2.39 postoperatively ($p=0.15$). Six patients filled out both preoperative and postoperative forms. There was significant improvement in their PCS ($p=0.025$), but no change in MCS ($p=0.50$).

Conclusions: Despite resection of the pubic symphysis, radical surgery for urosymphyseal fistula results in improved physical function scores within six months of surgery. Preoperative physical and mental function scores are well below the national average, but following surgery both return to the population average for men of the same age.

Poster #13

The urologist's telemedicine experience: Bridging distances or creating gaps?

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Introduction: Due to the COVID-19 pandemic, telemedicine has been increasingly used as a means of healthcare delivery. This is the first survey-based study of urologists' telemedicine experience. Our goal was to evaluate urologist satisfaction and identify opportunities for telemedicine experience improvement.

Methods: An online survey was administered in February 2021 to 339 urology attending physicians and advanced practice providers who see adult urology patients and are part of the Northeastern Section of the American Urological Association, practicing at Maine Medical Center and Boston University.

Results: In total, 46 participants responded for a response rate of 14%. Data collection is ongoing. Most respondents (89%, 46) had no prior telemedicine experience. Reasons for deferring telemedicine use included lack of institutional support (61%, 25), insurance compensation (56%, 23), and feeling that telemedicine is less effective than in- person visits (27%, 11). 1) Readiness: Most respondents, 69% (31), did not receive formal telemedicine training, however, 67.4% (29) indicated they would recommend formalized training. 2) Access: Among all respondents, 44% (20) encountered technical challenges, 56% (26) experienced difficulty establishing a rapport and 22% (10) felt their understanding of patients' concerns was worse using telemedicine. Urologists felt inadequately compensated for telemedicine visits (60%, 23) compared to (19%, 8) in-person visits. 3) Quality of care: Overall, 41% (19) of urologists felt they provided worse care using telemedicine and 44% (20) felt lack of physical exam data changed or delayed management. Other reasons cited by those who felt their clinical assessment was suboptimal included inability to visualize relevant patient body parts (85%, 22) and patients' unfamiliarity with technology causing a visit delay (58%, 15). 4) *Quality of work environment:* At the end of a day of telemedicine clinic, 57% (26) of respondents felt their energy level was the same or better, 37% (17) reported more stress, and 77% (34) reported the same or less unfinished work. Most urologists, (91%, 39) felt that established patient visits would lend themselves to "good" telemedicine visits. Overall, participants (59%, 27) preferred in-person visits. Urologists open to either, (41%, 19), identified patient preferences, type of visit, and patient familiarity with technology as deciding factors.

Conclusions: While telemedicine does offer time-saving benefits for patients and physicians, this study identified common sources of frustration: inadequate compensation, technological difficulties, difficulty establishing rapport, and inability to perform a physical exam. Use of telemedicine in select patient populations and the development of structured learning modules may improve the telemedicine experience.

Funding: University of Rochester Medical Center, Department of Urology.

Poster #15

Meta-analysis of perioperative outcomes comparing general and neuraxial anesthesia

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Introduction: The relative risks of neuraxial anesthesia (NAX) vs. general anesthesia (GA) have been previously explored; however, reported outcomes most frequently relate to mortality, bleeding, or recovery time. There remains a paucity of literature comparing minor outcomes related to anesthesia. The primary objective of this study was to determine the risk of urinary tract infection after NAX vs. GA during surgery, and secondarily to assess other commonly reported surgical outcomes.

Methods: A search was conducted identifying studies comparing urological surgical outcomes stratified by GA or NAX, and then expanded to include other specialties; inclusion criteria was specific for those that cited UTI as an outcome. For those studies meeting criteria, any other outcomes compared were recorded. The incidence of UTI per anesthesia modality was used to generate a meta-analysis comparison with the Review Manager 5.4 software. Other outcomes reported by four or more of these initial studies were also compared using this software. A P value <0.05 was considered statistically significant.

Results: We identified 10 studies meeting inclusion criteria. Risk of UTI was significantly lower with NAX (GA=0.051%, NAX=0.048%; p=0.02). Blood transfusion ($p<0.00001$) and failure to wean from ventilator ($p<0.00001$) were also found to be lower with NAX. Analysis of other outcomes were not significant, including sepsis, pneumonia, myocardial infarction, major adverse cardiac events, wound dehiscence, mortality, acute renal failure, renal insufficiency, unplanned intubation, superficial wound infection, deep wound infection, reoperation or return to the operating room, and pulmonary embolism (Table 1). Seven out of 10 studies were orthopedic procedures, and 2/10 general surgery (colectomy, below the knee amputation). The urologic study conversely found that NAX had an increased incidence of UTI after TURP. While incidence of UTI and blood transfusion were significant overall, risk appeared to be specific to the surgical procedure performed.

Conclusions: Our study revealed a significant decrease in risk of UTI with the use of NAX. Increased UTI with NAX appears specific only to urologic procedures. Further analysis reinforced a significantly lower risk of blood transfusion and failure to wean from intubation with the use of NAX. Incidence of UTI and blood transfusion appeared to be procedurally specific, which warrants further exploration.

OUTCOME:	PERCENT GA (n/total):	PERCENT NXA (n/total):	P VALUE:
UTI	0.051 (9292/181762)	0.048 (1581/32990)	0.02
SEPSIS	0.023 (676/28974)	0.019 (393/20284)	0.15
BLOOD TRANSFUSION	0.177 (20757/117338)	0.162 (3794/23365)	<0.00001
PNEUMONIA	0.062 (7204/116229)	0.031 (648/20705)	0.56
MI	0.013 (1503/116294)	0.015 (354/22843)	0.27
MACE	0.042 (1016/23993)	0.034 (580/16854)	0.5
WOUND DEHISCENCE	0.003 (72/23928)	0.003 (43/14716)	0.6
MORTALITY	0.041 (815/19807)	0.030 (392/12896)	0.87
ACUTE RENAL FAILURE	0.016 (379/23993)	0.018 (296/16854)	0.09
RENAL INSUFFICIENCY	0.005 (70/14761)	0.006 (45/7328)	0.14
FAILURE TO WEAN FROM VENTILATOR	0.081 (8602/106018)	0.037 (478/12795)	<0.00001
UNPLANED INTUBATION	0.017 (246/14761)	0.015 (109/7328)	0.1
SUPERFICIAL WOUND INFECTION	0.026 (184/7142)	0.011 (144/13618)	0.24
DEEP WOUND INFECTION	0.001 (74/73972)	0.003 (49/15920)	0.49
REOPERATION/RETURN TO OR	0.003 (67/20361)	0.035 (445/12672)	0.06
PE	0.006 (87/15638)	0.006 (68/12385)	0.74

Poster #15. Table 1.

Poster #16

Interventions to improve physician compliance to imaging guidelines for prostate cancer: A systematic review

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Introduction: Radiographic staging with bone scan or computed tomography (CT) is not indicated for men with low-risk prostate cancer. Prior studies have shown that physician compliance with imaging recommendations for prostate cancer staging has been widely variable, leading to inappropriate use of testing and increased costs. The purpose of this systematic review is to identify interventions that have been associated with improved physician compliance to imaging guidelines for prostate cancer staging.

Methods: Using PRISMA guidelines, a systematic review was conducted using PubMed through January 2021. Medical subject headings (MeSH) terms included "Practice Patterns, Physicians," "Guideline Adherence," "Unnecessary Procedures," or "Quality Improvement," and "Prostatic Neoplasms/diagnostic imaging." Of 74 resulting papers, five met inclusion criteria by: 1) relating to prostate cancer imaging; 2) relating to interventions to impact physician compliance with guidelines; and 3) having specific data describing the association between intervention and physician compliance. Papers about other malignancies or that had no intervention, evaluation, or data, were excluded.

Results: Five studies met inclusion criteria, with a total of 12 657 patients (Table 1). Each of these studies demonstrated statistically significant post-intervention improvement of physician compliance to imaging guidelines for staging prostate cancer. Although the studies focused on reduction of unnecessary imaging, one also accounted for increasing imaging when indicated. In this case, the metric improved after intervention, but without statistical significance. Four of the five initiatives were multidimensional, with education, clinical champions, and some form of performance feedback. The only study with a unidimensional intervention utilized a Clinical Reminder Order Check (CROC) built into the electronic medical record (EMR). None of the five studies included a control group or randomization, thus causality was not proven.

Study / Paper	Patient Count	Intervention	Primary Impact group	Primary Outcomes	Methods	Limitations	Other Notes
MUSIC: Patterns of Care in the Radiographic Staging of Men with Newly Diagnosed Low Risk Prostate Cancer	813	Education, Clinical Champion, Performance Feedback	Newly diagnosed patients w low risk Prostate Cancer	Reduced % of patients imaged (Bonescan 3.7% --> 1.3%; p=0.03; all negative; CT 5.2% --> 3.2%; p=0.17; all negative)	Practice data to web-based registry of all men w newly diagnosed PCa; low-risk patient imaging patterns were compared before & after practice-level performance feedback & guideline review led by practice clinical champion.	Not randomized / no control group ... No causality proven.	
A Statewide Intervention Improves Appropriate Imaging in Localized Prostate Cancer	10,554	Education, Clinical Champion, Performance Feedback	Newly diagnosed patients w PSA<20, Gleaseon>8 (and stage cT3+ for CT)	Reduced % of patients imaged (Bonescan 11.0% --> 6.5%; p<0.0001; 1.6% positive, none that were low-risk; CT 14.7% --> 7.7%; p<0.0001; 0.3% positive)	Baseline rates of radiographic staging established in 2012-2013; interventions including champion-led education and performance feedback implemented in 2014. Imaging utilization remeasured in 2015 to evaluate for changes in practice patterns.	Not randomized / no control group ... No causality proven.	Also increased indicated imaging (not statistically significant)
Regional Collaboration to Improve Radiographic Staging Practices Among Men With Early Stage Prostate Cancer	858	Education, Clinical Champion, Performance Feedback	Newly diagnosed patients w low- to intermediate-risk Prostate Cancer	Reduced % of patients imaged (Bonescan 31% --> 16%; p<0.01; driven by low intermediate risk cancers p<0.05; 2.4% positive among low-risk, 3.5% positive among intermediate risk. CT 28% --> 13%; p<0.01; driven by low-intermediate risk cancers p<0.05; 3.6% positive among low-risk, 1.8% positive among intermediate risk)	Bone scan & CT use evaluated across PCa risk strata, practice locations, & before / after interventions over 3 phases of data collection from 5/2009 to 9/2010. Last 2 phases were preceded by champion-led interventions including comparative performance feedback and review & dissemination of clinical guidelines.	Not randomized / no control group ... No causality proven.	Reduced practice variation & Improved guideline adherence
A clinician-centred programme for behaviour change in the optimal use of staging investigations for newly diagnosed prostate cancer	144	Education, Clinical Champion, Performance Feedback	Newly diagnosed patients w low- to intermediate-risk Prostate Cancer	Reduced % of patients imaged (Bonescan Low risk 21.4% to 18.2%, p=0.84; Intermediate risk 63.2% to 36.8%, p=0.02; High risk 87% to 65%, p=0.07; CT Low risk 42.9% to 0.0%, p=0.01; Intermediate risk 89.5% to 34.2%, p<0.001; High risk 87% to 85%, p=0.63)	All newly diagnosed PCa patient data from 7/2014-7/2015 reviewed & presented to participating urologists by clinical champion, followed by focused education on current guidelines. Data reassessed 11/2015-7/2016. Patients stratified by risk (D'Amico classification system).	Not randomized / no control group ... No causality proven.	
A Clinical Reminder Order Check Intervention to Improve Guideline concordant Imaging Practices for Men With Prostate Cancer: A Pilot Study	288	EMR	Veterans with low-risk prostate cancer	Improved adherence to imaging guidelines (57% --> 73% of low-risk pts received guidline-concordant care)	CROC implemented 4/2/2015-11/15/2017. VA administrative claims from Corporate Data Warehouse used to analyze imaging rates among men w low-risk PCa before & after CROC implementation.	Not randomized / no control group ... No causality proven.	

Poster #16. Table 1. Results summary.

Conclusions: Physician compliance to imaging guidelines for staging prostate cancer can be improved through EMR-based CROC or combination intervention with clinical champions, education, and feedback. We did not find any negative studies showing lack of efficacy of an intervention, perhaps due to publication bias. Post-intervention improvement in compliance has been demonstrated at individual institutions and larger organizations spanning a region or state. Institutions should adopt similar interventions to improve compliance and decrease variations in care on a larger scale.

Poster #17

Antibiotic stewardship for office cystoscopy at a single academic institution

Kelly R. Pekala[1], *Adam J. Sharbaugh*[1], *Michelle Yu*[1], *Jonathan Y. Lin*[2], *Valentina Grajales*[1], *Hermoon Worku*[3], *Jordan M. Hay*[3], *Toby S. Zhu*[3], *Kody M. Armann*[3], *Chandler N. Hudson*[3], *Benjamin J. Davies*[1], *Bruce L. Jacobs*[1]
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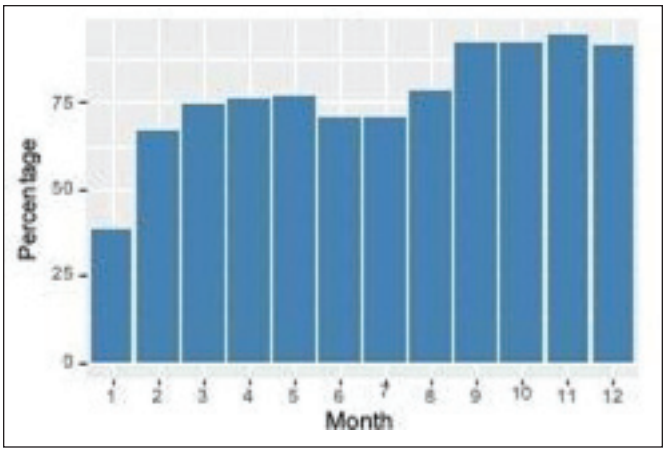
Introduction: Inappropriate antibiotic administration has a host of well-defined deleterious downstream effects. The American Urological Association (AUA) released antibiotic guidelines for cystoscopy in June 2019 that recommended oral antibiotics only if there is a break in the mucosal barrier due to biopsy, dilation, or other similar procedures. As a result, we created a novel clinic-based rapid survey to increase AUA antibiotic guideline adherence.

Methods: To obtain baseline data, we retrospectively reviewed the urology clinic schedule for three-months and identified all patients who underwent cystoscopy. We then completed a literature review and designed a cystoscopy survey based on previous protocols and AUA guidelines to identify patients at high risk of infection. We then implemented a multi-pronged intervention for a twelve-month period where we provided a "formal" grand rounds presentation, ad-hoc emails with individual updates, monthly progress reports, edited the electronic health record cystoscopy order set, educated clinic staff, and started using the cystoscopy survey. We then recorded antibiotics given for prophylaxis at time of procedure, individual patient risk factors for infection, 30-day infection outcomes, and urine culture data both pre-intervention and post-intervention.

Results: We identified 508 cystoscopies pre-intervention and 2220 cystoscopies post-intervention. There was no significant difference between pre-intervention (n=16, 3.15%) and post-intervention (n=43, 1.94%) infection rates (p=0.09). We found that 99% of patients were administered antibiotics pre-intervention versus 71% post-intervention (p<0.01). During the post-intervention period we avoided administering 621 doses of antibiotics to patients. Of all post-intervention patients, 64% were deemed high-risk for infection and antibiotics were indicated based on the protocol. Survey completion rates improved over time from 38% in January to 91% in December (p<0.01) (Fig. 1).

Conclusions: We found that implementation of a cystoscopy survey enabled rapid adoption of new AUA guidelines on antibiotic prophylaxis for cystoscopy, which resulted in a drastic reduction in the amount of antibiotics administered without a spike in infection rates.

Funding: Bruce L. Jacobs, MD MPH is supported in part by the Shadyside Hospital Foundation.



Poster #17. Fig. 1. Survey completion rate.

Poster #18

Utilizing a prostate biopsy survey to implement new AUA guidelines

Michelle Yu[1], Kelly R. Pekala[1], Jonathan Y. Lin[2], Adam J. Sharbaugh[1], Toby S. Zhu[3], Hermoon Worku[3], Kody M. Armann[3], Chandler N. Hudson[3], Jordan M. Hay[3], Valentina Grajales[1], Jonathan G. Yabes[4], Benjamin J. Davies[1], Bruce L. Jacobs[1]

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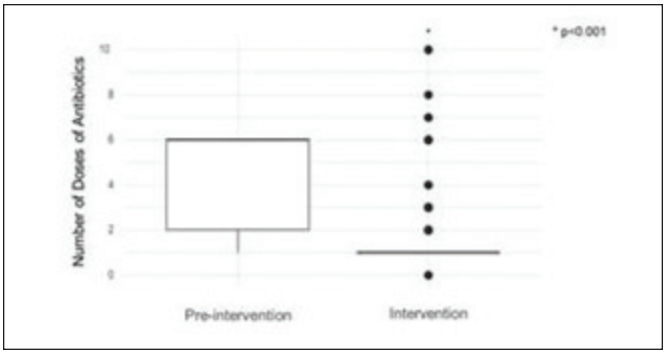
Introduction: Urinary tract infection and sepsis are well-described complications after transrectal prostate biopsy. The AUA antimicrobial prophylaxis guidelines currently recommend a single dose of fluoroquinolone for low-risk individuals. For high-risk individuals, an augmented regimen is recommended. There is limited guidance on identifying these "high-risk" patients.

Methods: We retrospectively reviewed clinic visits over three months and identified patients undergoing transrectal prostate biopsy. We designed a survey to identify high-risk patients to target for augmented prophylactic antibiotics. We then implemented a multipronged intervention including a departmental grand rounds presentation, targeted ad-hoc emails with feedback reviewing literature, monthly progress reports, altering the clinic prostate biopsy smart set in the electronic medical record system, and held an in-service for clinic staff. The intervention was implemented for 12 months and we recorded patient risk factors, antibiotics given, and 30-day infection rates for all patients undergoing transrectal prostate biopsy in the pre-intervention and intervention groups.



Poster #18. Fig. 1. Median doses of antibiotics prescribed for transrectal prostate biopsy.

Results: We identified 115 patients in the pre-intervention and 417 patients in the intervention group. The overall 30-day infectious complication rate was not statistically significant between the groups, with six (5.2%) in the pre-intervention and 22 (5.3%) in the intervention group (p=0.963). The sepsis rate in the pre-intervention group (1 [0.9%]) and the intervention group (7 [1.7%]) also did not differ, (p>0.99). The median [interquartile] doses of antibiotics administered in the pre-intervention and intervention groups were six [1, 6] and one [1, 1] respectively, (p<0.001). Between the two groups, there was no difference in age, antibiotics within six months, healthcare worker status, hospitalizations within 30 days, and diabetes mellitus. Additional antibiotics were given to 96 (88%) of the pre-intervention group and 228 (57%) of the intervention group.

Conclusions: Administering surveys pre-prostate biopsy identified high-risk patients who should receive an augmented antibiotic regimen. We were able to encourage adherence to the new antibiotic guidelines through targeted education, and decreasing the number of antibiotics given without an increase in infection rates.

Funding: Bruce L. Jacobs, MD MPH is supported in part by the Shadyside Hospital Foundation.

Poster #19

Preliminary analysis of IPSS as a risk factor for postoperative urinary retention in a thoracolumbar spine surgery patient population

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Introduction: Orthopedic patients appear to be afflicted by postoperative urinary retention (POUR) at a high rate; however, investigations into the potential risk factors for spine surgery patients in particular have been limited. The objectives of this study were: 1) to report the prevalence of POUR in a spine surgery patient population; and 2) to identify whether a higher score on the International Prostate Symptom Scale (IPSS) constitutes a risk factor for the development of POUR.

Methods: This prospective observational study utilized male patients over the age of 50 undergoing elective thoracolumbar spine surgery with or without fusion. All patients were enrolled as participants in the Canadian Spine Outcomes and Research Network (CSORN) registry at a single tertiary care center. Baseline urinary tract symptomology was measured using the IPSS prior to surgery. The major outcome under investigation was whether urinary retention was noted by the treating surgeon as a post-operative adverse event. POUR was defined as an inability to void or elevated bladder scan volume. Descriptive statistics were generated. Statistical analysis was performed using an independent samples t-test (α=0.05).

Results: Data from 105 patients with mixed spinal pathologies were analyzed (mean age ± SD = 66.75±9.18). A total of 27 patients experienced POUR which represented 25.7% of the overall population. All cases of POUR were classified as grade 2, meaning that minor non-invasive treatment was required that resulted in no long term effect. Of the 105 patients, 94.3% reported having some level of symptomology of urinary dysfunction. Patients with degenerative disc disease developed POUR at a rate of 60.0% compared to rates of 16.7%, 21.1%, 27.7%, and 33.3% for patients with spondylolisthesis, disc herniation, stenosis and deformity, respectively. Higher IPSS score was found to represent a significant risk factor for the development of POUR (p<0.05; mean score of 11.67 vs. 8.57).

Conclusions: Male spine surgery candidates over the age of 50 may have a substantial risk of developing POUR at a rate of around one in four. The IPSS questionnaire may represent a useful clinical tool for successfully identifying the patients who have an elevated chance of experiencing this outcome in advance. Both in-hospital care planning and patient

expectations could benefit greatly from this knowledge. An additional component of this investigation will explore other factors that may predict the development of POUR following spine surgery.

Poster #20

Significant delays in cancer surgery during the COVID-19 pandemic

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Introduction: As the COVID-19 pandemic swept through the U.S. in 2020, the strain on the healthcare system resulted in the delay of many surgeries. With each wave of the pandemic, due to limitation in healthcare resources, attempts by patients to limit exposure to the healthcare system, and intermittent county and state instituted lockdowns, surgeries were rescheduled or cancelled. Currently, the extent of the delays the pandemic had on cancer surgeries nationwide and the downstream effect on oncologic outcomes is undetermined. We sought to quantify the delay in cancer surgeries in 2020 due to COVID-19.

Methods: Using the Symphony Health COVID-19 database, we extracted the date of cancer diagnosis and date of surgery before COVID-19 (May 1, 2019 to March 15, 2020) and after the beginning of the COVID-19 pandemic (March 16, 2020 to February 15, 2021) for a spectrum of cancer surgeries. We compared the median waiting period in weeks from diagnosis to the date of surgery between pre-COVID-19 and during COVID-19 period using Wilcoxon rank sum test for bladder, breast, lung, colon, rectal, kidney, prostate, and uterine cancer. We adjusted for race, age, income, and gender.

Results: A total of 99 326 patients were included in the pre-COVID-19 period and 94 749 patients were diagnosed with one of the various cancers during the COVID-19 pandemic. All cancer surgeries had statistically significant delays in the timing of surgery (when comparing medians and third quartiles) during the COVID-19 pandemic (all $p<0.001$) (Fig. 1).

Conclusions: Based on the Symphony Health COVID-19 database, the COVID-19 pandemic significantly delayed surgical care across all surgical subspecialties. Further studies are required to monitor and clarify if the delay in surgery manifests deleterious downstream outcomes in cancer care.

Poster #21

How to screen for prostate cancer after prostatic urethral lift? Changes in prostate-specific antigen

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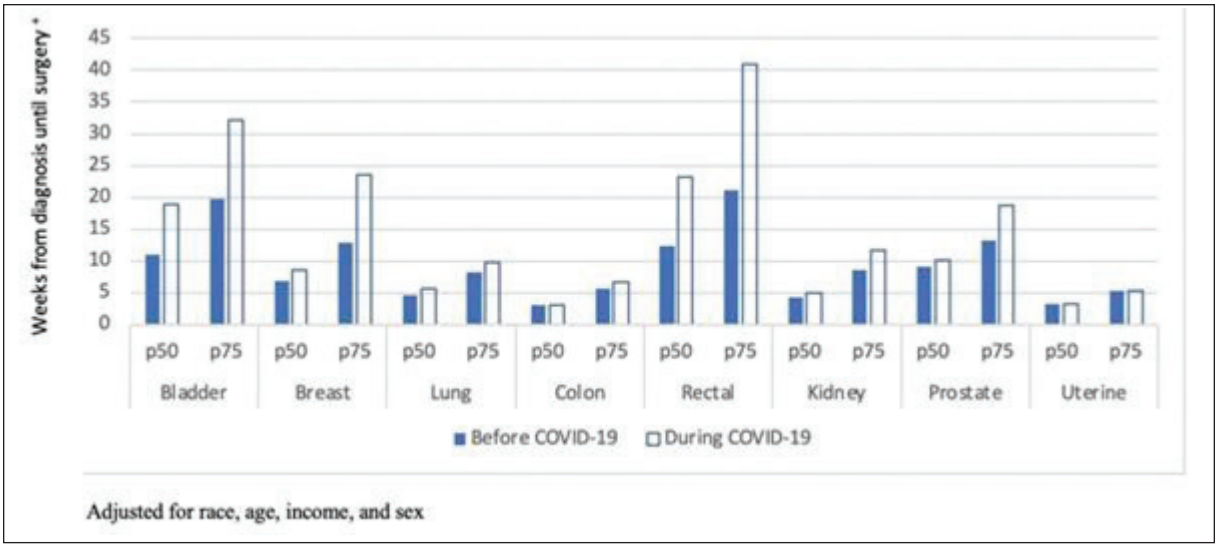
Introduction: The prostatic urethral lift (PUL) is an endoscopic procedure which places permanent prostate implants to open up the prostatic urethral channel. Endoscopic procedures temporarily raise the prostate-specific antigen (PSA); in those that decrease prostate volume, the PSA has later been found to stabilize at lower values. With PUL, there is no known decrease in tissue volume. Unlike other endoscopic procedures, PUL leaves permanent implants within the tissue, and it is unknown how this affects PSA. Both temporary increases and long-term decreases in PSA values need to be taken into consideration during prostate cancer screening. We aimed to discover if PSA levels changed following PUL.

Methods: A retrospective review of patients who underwent PUL between January 2016 and June 2020 at a large urology group practice in Western New York was performed (IRB-00002693). Paired t-test was used to compare pre- and post-PUL serum PSA levels and PSA densities at different time intervals. Patients on 5a-reductase inhibitor medications and those without documented pre-procedure PSA level or prostate volume were excluded.

Results: Our final cohort consisted of 720 patients who underwent PUL, with mean age of 69 (SD ±8), pre-PUL serum PSA of 2.38 ng/ml (SD ± 3.79), prostate volume of 39.4 ml (SD ± 18.8), and number of implants of 5 (SD ±1). Average time to post-PUL PSA was 8.3 months (SD ±5). There was significant change in serum PSA levels, with 0.25 ng/ml increase at 9–12 months (95% CI 0.08–0.42, p=0.005) and 0.48 ng/ml increase at 12–15 months (95% CI 0.20–0.75, p=0.001). Similar trend was observed when PSA levels were normalized to prostate volume. There was significant change in PSA density with 0.0085 ng/ml^2 increase at 9–12 months (95% CI 0.0030–0.0140, p=0.003) and 0.0096 ng/ml^2 increase at 12–15 months (95% CI 0.0031–0.0162, p=0.005). When patients were stratified by number of implants, those with five or more had significant increase in serum PSA at 9–12 months (+0.28, 95% CI 0.04–0.51, p=0.024) and 12–15 months (+0.56, 95% CI 0.26–0.86, p=0.0006). This trend was not observed in patients with less than five implants.

Conclusions: After PUL, patients experienced small increases in serum PSA levels from baseline 9–15 months after the procedure. Patients with five or more implants were more likely to experience increase in serum PSA. Further studies are necessary to evaluate predictors of PSA change to help inform prostate cancer screening guidelines for patients who have undergone PUL.



Poster #20. Fig. 1. Adjusted time to cancer surgery before and during COVID-19.

Poster #22

Trends in cancer screening nationwide during the COVID-19 pandemic

Daniel Pelzman[1], Jonathan Lin[2], Maria Pere[1], Michelle Yu[1], Jonathan Yabes[2], Benjamin Davies[1], Lindsay Sabik[2], Bruce Jacobs[1]

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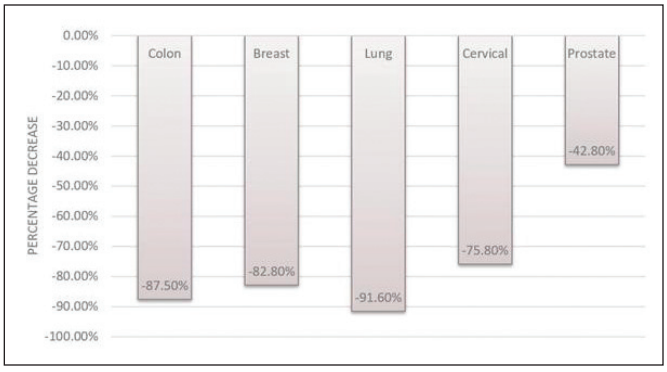
Introduction: An important consequence of the COVID-19 pandemic was a precipitous decline in elective outpatient encounters, such as cancer screening. It is particularly important to examine the effect of delays in cancer screening as a result of COVID-19 due to the potential for future morbidity, but as of yet, there have been no reports of cancer screening rates throughout the multiple waves of the pandemic on a nationwide level. We sought to examine monthly trends in prostate cancer screening during 2020 to better inform future clinical care.

Methods: To obtain cancer screening rates, we queried the Healthjump dataset, which provides outpatient encounter information for more than 40 million patients nationwide and is updated daily. This dataset was obtained through the COVID-19 Resesarch Database. Encounter level data for colon, breast, lung, cervical, and prostate cancer screening were collected from January 2019 to December 2020 using a combination of ICD-10 and CPT/HCPCS codes.

Results: Screening rates declined significantly in the first phase of the pandemic with a 42–91 percent drop in weekly rates compared to January and February of 2020, depending on cancer type (Fig. 1). However, by August of 2020, screening rates for all cancers had returned to near-2019 levels. This trend continued for the remainder of 2020, despite multiple subsequent "waves."

Conclusions: Cancer screening encounters quickly declined in the first three months of the COVID-19 pandemic but consistently returned to pre-pandemic rates between August and December 2020. Hopefully this is an indication that decreased cancer screening due to COVID-19 was short-lived and will not lead to more advanced disease at diagnosis in the future.

Funding: Dr. Jacobs is sponsored in part by the Shadyside Hospital Foundation.



Poster #22. Fig. 1. Percentage decrease at 4-week nadir, compared to Jan/Feb 2020.

Poster #23

Effect of surgeon volume and facility volume on outcomes of benign prostatic hyperplasia surgery

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Introduction: Surgical volume is intimately associated with better operative outcomes, both at the surgeon and facility level. However, there is limited of such a relationship for transurethral resection of the prostate (TURP) and laser procedures for benign prostatic hyperplasia (BPH). As such, we report the effect of surgeon and facility volume on outcomes of TURP and laser treatment of BPH. We also present demographic predictors of treatment at high-volume facilities.

Methods: We used New York State Department of Health Statewide Planning and Research Cooperative System (SPARCS) data. We included adult patients who underwent TURP or laser in the outpatient setting between January 2005 and December 2016. Average annual surgeon and facility combined volumes of TURP and laser procedures were calculated and broken down by tertile (low-volume, medium-volume, and high-volume). Adjusting for baseline demographics, the effect of volume on short-term outcomes (30-day and 90-day readmission) was examined using mixed-effect logistic regression models with facility-level random intercept. Cox proportional hazard models with robust variance estimator accounting for facility-level cluster were used for long-term outcomes (stricture and reoperation).

Results: We included 34 444 patients. Among those, 21 074 (61.2%) underwent laser procedures and 13 370 (38.8%) underwent TURP. Both higher facility volume and surgeon volume were associated with lower odds of readmission. Treatment at high-volume facilities was also associated with lower hazards of developing stricture. Outcomes by surgeon and facility volume adjusting for patient demographics are presented in Table 1. High-volume surgeons operating at high-volume facilities had better short-term outcomes and lower hazards of reoperation compared to high-volume surgeons working at low-volume facilities (all p-int<0.05). Statistically significant predictors of treatment at high-volume facilities included Medicaid insurance (OR 0.44, 95% CI 0.38–0.51, p<0.001) and white race (OR 1.62, 95% CI 1.52–1.73, p<0.001).

Conclusions: Higher surgeon and facility volume are associated with lower odds of readmission after BPH surgery, with higher facility volume also associated with lower hazards of developing strictures. There are interactions between surgeon volume and facility volume suggesting that the effect of surgeon experience on outcomes is modified by their facility's volume. Medicaid insurance and Black race were associated with higher odds of treatment at low-volume facilities, highlighting disparities in access to high-volume BPH centers.

	Re-admission 30-day: OR (95%CI)	Re-admission 90-day: OR (95%CI)	Reoperation Long-term: HR (95%CI)	Stricture long-term: HR (95%CI)
Facility volume				
Low	Ref	Ref	Ref	Ref
Medium	0.85(0.75,0.97) *	0.85(0.75,0.96) *	0.93(0.79,1.11)	0.84(0.54,1.30)
High	0.75(0.63,0.88) **	0.77(0.65,0.90) **	0.89(0.76,1.04)	0.67(0.48,0.94) *
Surgeon volume				
Low	Ref	Ref	Ref	Ref
Medium	0.94(0.86,1.02)	0.94(0.87,1.02)	1.04(0.92,1.16)	0.97(0.80,1.17)
High	0.90(0.82,0.99) *	0.92(0.84,1.00) *	1.01(0.86,1.20)	1.04(0.64,1.69)

Odds Ratio (OR); Confidence Interval (CI); * p<0.05; ** p<0.01; *** p<0.001

Poster #23. Table 1. Adjusted short-term and long-term outcomes by surgeon volume and facility volume.

Poster #24

Predicting durability after prostatic urethral lift (PUL) with real-world baseline characteristics

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Introduction: Treatment durability is an important hallmark for urologists and patients when considering optimal treatments for BPH. Five-year durability of the UroLift PUL system has been demonstrated in the LIFT pivotal trial, and real-world data has revealed favorable outcomes in various BPH populations. Here, we present an analysis investigating how baseline characteristics corresponded to PUL durability in the real world.

Methods: The international Real-World Retrospective (RWR) database includes 2714 PUL subjects (non-urinary retention at baseline). The likelihood of a successful response for subjects in this group is defined as a lack of subsequent BPH surgery through the point at which 90% of the population was censored or followup data was no longer available and was calculated using uni- and multivariate predictive assessments for baseline parameters including age, comorbidities, medical history and surrogates of BPH disease severity (e.g., IPSS, QoL, Qmax). Univariate predictive assessments were also conducted for a subset of RWR subjects whose baseline characteristics mirror inclusion criteria of the LIFT trial (RWR-LIFT, n=1079). A stepwise selection procedure was used to determine variables for the RWR multivariate logistic regression model. An odds ratio >1 indicated a higher probability of intervention for failure to cure LUTS.

Results: PUL durability was not influenced by patient age, duration of LUTS prior to PUL, or the presence of comorbidities and medical conditions at baseline such as diabetes, incontinence or obstructive median lobe. Higher baseline IPSS and QoL were significant predictors of reintervention in RWR and RWR-LIFT populations. Prostate volume of >100 cc was not a predictor of retreatment. Odds ratios for all significant predictors were close to 1, and the largest odds ratio was 1.2 for QoL. When QoL was entered into a multivariate model, no other baseline covariates added significantly to the prediction. The analysis included 1070 days of followup based on the density of available data, and 158 patients were retreated during this time.

Conclusions: Baseline characteristics of IPSS and QoL were found to be possible predictors of retreatment following PUL, suggesting that a more severe disease state at baseline may increase the likelihood of subsequent BPH surgery. Urologists may use these findings as support to discuss BPH interventions earlier in the disease process.

Funding: NeoTract/Teleflex.

Baseline Covariate	RWR		RWR-LIFT	
	Odds Ratio	P-Value	Odds Ratio	P-Value
Age (yrs)	0.988	0.183	0.987	0.331
IPSS	1.027	0.018	1.068	0.003
Quality of Life	1.151	0.004	1.174	0.002
Peak Flow Rate (Qmax)	0.989	0.531	0.958	0.638
Prostate Volume (>100cc vs. ≤100cc)	2.378	0.144	n/a	n/a
# Implants	0.977	0.673	0.995	0.958
Implant per volume	0.077	0.287	0.272	0.734

Poster #24. Table 1. Univariate predictive analyses of RWR baseline characteristics, comorbidities, and medical history.

Poster #25

Burden of prior authorization of care on a urology practice

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Introduction: Prior authorizations (PAs) by insurance plans are often required before imaging, procedures or medications can be ordered with the justification of appropriate and cost-effective care. However, PAs can delay timely delivery of patient care and place a significant administrative burden on physicians and practices. The impact of PA requirement has not been studied well and no studies on PAs' burden on urology practice are available. Our aim was to analyze and quantify the burden of PAs on a urology group practice.

Methods: PAs required for imaging and medication from an outpatient urology clinic from November 2020 to February 2021 were reviewed (n=267). Prior authorizations were categorized and tracked the delays between initial order and final approval. We calculated the time spent on PAs, and the estimated overall financial burden on the practice.

Results: Of the PAs required, 60.6% were for imaging studies and 39.4% were for medications. CT abdomen/pelvis (30.1%) and testosterone replacement therapy (12.5%) were the most frequent orders requiring PAs. Initial decision for PAs took a median of two days (IQR 0–6, range 0–36), whereas decisions after an appeal (n=51) took a median of 10 days (IQR 5–23, range 0–125 days). Initial approval rates were 67.5%, and final approval rates after appeals were 87.7%. Of orders originally denied, a majority (77.3%) were appealed, 13.6% required alternative orders, and 7.6% paid out-of-pocket. Accounting for the time spent by clinical staff, an estimated $10.53 was spent by the practice on each PA.

Conclusions: PAs for imaging studies and medications pose a significant administrative and financial burden to the urology practice. These data may be used to improve staffing levels in the clinic and to collaborate with the insurance plans for process improvement.

Poster #26

Interventions to reduce postoperative opioid prescriptions after urologic surgery: A systematic review and meta-analysis

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Introduction: Opioid prescriptions (opioid-Rx) given after hospital discharge are a major contributor to the dissemination of opioids in the community and to the opioid abuse epidemic. In recent years, concerted efforts have been made to limit opioid-Rx at discharge from surgery. We conducted a systematic review of literature (PROSPERO CRD42021226083) to identify the type of interventions used and the extent of opioid-Rx reduction after urologic surgery.

Methods: A systematic review (within PRISMA guidelines) of Medline, Web of Science, and Cochrane databases was performed for studies on opioids and urologic surgery (both major and minor). The final inclusion criterion was the availability of opioid-Rx data before and after an intervention to limit opioid-Rx (in morphine milligrams equivalents, MME) given at discharge. Of the 3139 initially identified studies, 22 studies met the inclusion criteria for the qualitative assessment and 19 studies were suitable for a meta-analysis using a random-effects inverse-variance model. The types of interventions were classified as either direct (e.g., patient education/counseling, standardized prescription guidelines, and multimodal pain protocols) or indirect (e.g., state-mandated prescriber education or limits on prescribed dosage or other pathways for reduction in opioid use). Subgroup analysis was also done comparing major (i.e., prostatectomy, cystectomy, etc.) vs. minor (i.e., endoscopic, scrotal, etc.) surgery.

Results: Of the 8318 patients that were included in the meta-analysis, 4443 were pre-intervention and 3875 were post-intervention. Thirteen studies used direct interventions, while six studies measured the effect of indirect interventions. The overall mean reduction in opioid-Rx was 67.59 MME (95% CI 54.23–80.94) with a wide range in mean changes from +3 to -170.19 MME. Direct interventions had a larger reduction in opioid-Rx (-76.68 MME, 95%, CI 60.04–93.31) compared to the indirect interventions (-46.72 MME, 95% CI 24.20–69.23, p<0.040). Opioid-Rx

decreases were noted in 11 studies of major surgery (-75.74 MME, 95% CI 54.84– 96.63) and six studies of minor procedures (-72.11 MME, 95% CI 56.11–91.19). There was significant heterogeneity and variability in the quality of data amongst studies (Cochrane Q 261.39, p<0.001; I^2 96.6%, 71.1–98.8%).
Conclusions: A wide range of interventions have been used with variable success to reduce opioid-Rx at discharge after urologic surgery. Direct interventions appear to have a greater impact than indirect interventions. Continued efforts are required to implement opioid-Rx reducing protocols after urologic surgery as these interventions can reduce the use and dissemination of opioids.

Poster #27

Similarities in BPH study criteria on *clinicaltrials.gov*

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Introduction: While a variety of study designs provide helpful medical advancement, prospective and randomized clinical trials offer the highest-grade evidence. Studies on benign prostatic hyperplasia (BPH) are often single-center, retrospective studies with high attrition rates, which yield studies with low grade evidence and often unreproducible results. The US National Library of Medicine maintains *clinicaltrials.gov* to allow providers and patients access to prospective trials on a variety of diseases.
Methods: Interventional research with a known study status on *clinicaltrials.gov* identified by a keyword search "benign prostatic hyperplasia" were examined. Inclusion/exclusion criteria, primary outcomes, secondary outcomes, study status, study enrollment, country of origin, intervention category, allocation, intervention model, masking, total study duration, and primary purpose were assessed.
Results: Of studies captured, 63% were completed, 19% were active, and 18% were terminated/withdrawn. Median study enrollment was 111 patients (range 0–1177) and mean duration of study was 904 days. International prostate symptom score (IPSS) was the primary outcome in 65% of studies. Secondary outcomes included maximum/peak urine flow rate (Qmax) (55% of studies) and postvoid residual (36%). The most common minimum age for inclusion was 50 years (42% of studies). A specific IPSS was used for inclusion in 73% of studies; the most common minimum IPSS was 13 (48%). Forty-eight percent of studies used specific Qmax for inclusion; the most common maximum Qmax was 15 ml/sec (64%). Minimum time experiencing BPH symptoms was used for inclusion in 32% (average of 5.5 months). Prostate volume was used for inclusion in 40%; the most common minimum volume was 30 cc (40%). A history or suspicion of cancer was an exclusion criterion in 78% of studies. In 50% of studies, undefined medical conditions as determined by researchers were used for exclusion. Other exclusion criteria included: urethral and/or bladder neck stenosis (54% of studies), previous genitourinary surgery (52%), cardiac disease (50%), renal function impairment (47%), and neurologic disease that may affect genitourinary function (45%).
Conclusions: BPH studies on clinicaltrials.gov utilize similar and common inclusion/exclusion criteria and outcomes. The homogeneity of these inclusion criteria may limit the study of certain populations and reduce generalizability of study results to patients outside of these criteria.

Poster #28

Low-dose CT utilization for evaluation of urolithiasis: Results from a quality analysis of a high-volume stone referral center

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Introduction: Non-contrast computed tomography of the kidneys, ureters, and bladder (CT KUB) is the gold standard for evaluation of urolithiasis. Radiation from repeat CT increases the risk of secondary malignancy and physicians should strive for radiation doses as low as reasonably achievable. Low-dose CT (LDCT; <4 mSv) has excellent performance in the diagnosis of urolithiasis. The objective of this study is to evaluate the utilization of LDCT at a high-volume endourology center.
Methods: A retrospective study was performed for CT KUB performed at St. Joseph's Hospital (London, Canada) in the month of January in 2011, 2013, 2015, 2017, and 2019 for stone assessment. Mean radiation dosage, tube voltage, encounter type, requisition details, umbilical fat thickness (UFT) was obtained from imaging software. UFT <2.5 cm was used as a surrogate for BMI <30 m/kg^2. Patient age, sex, and need for further imaging for diagnosis following initial CT KUB was documented from the electronic record.
Results: A mean of 50 scans were performed each January (N=250). Studies were performed with 120 kV on the GE 64 Slice Discovery HD 750. Mean radiation dosage was 5.7 mSv (2.9–20.4 mSv). Overall LDCT utilization was 50.8% and was 35.7%, 54.5%, 53.2%, 49.1%, and 58.1% in 2011, 2013, 2015, 2017, and 2019, respectively. Of CT KUB ordered by urologists for stone evaluation, only 50.5% were LDCT (mean: 5.6 mSv). Factors associated with LDCT included female gender (59.3% vs. 43.8%; p=0.016) and low UFT (64.2% vs. 42.9%, p<0.001) No patients required further imaging tests to clarify the diagnosis of urolithiasis following the initial CT scan.
Conclusions: Reducing radiation exposure is important for patients being evaluated for urolithiasis. Despite widespread knowledge regarding LDCT protocols and urologist expectations that LDCT should be employed, this only occurs about half the time at a high-volume center, even when the requisition is specific for evaluation of stones and BMI <30 kg/m^2. Regular evaluation of LDCT utilization and collaboration between urology and medical imaging departments is critical for improvement of radiation safety outcomes.

Poster #29

The use of tranexamic acid in urological surgeries: A systematic review

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Introduction: Tranexamic acid (TXA) is an antifibrinolytic agent widely used in surgery to decrease bleeding and reduce the need for blood product transfusion. While the application of TXA has been widely documented in many surgical specialties, the role of TXA in urological surgeries is not well-summarized. We conducted a systematic review of studies reporting outcomes of TXA use in urological surgery.
Methods: A comprehensive search was conducted from the following databases: PubMed, Embase, Cochrane Library, and Web of Science. Two reviewers, independently and in duplicate, performed title and abstract screening, full text review, and data collection. Primary outcomes included estimated blood loss (EBL) and blood transfusion rates. Secondary outcomes included TXA administration characteristics, perioperative outcomes, and postoperative complications. Risk of bias for randomized controlled studies was evaluated with the Cochrane tool, and the MINORS score was used for other comparative studies.
Results: A total of 15 studies consisting of 2343 patients were included in the final analysis (Table 1). These included seven studies on percutaneous nephrolithotomy, four on transurethral resection of the prostate, three on prostatectomy, and one on cystectomy. In 13 studies, EBL (TXA group range: 93–1103 ml vs. placebo group range: 87.62–1335 ml; p<0.0001–0.05) and blood transfusion rates (TXA group range: 0%–34% vs. placebo group range 0%–57.5%; p<0.0001–0.05) were significantly reduced in TXA groups. Perioperative reductions in hemoglobin, operative time, and incidence of postoperative complications were significantly lower in groups receiving TXA. The incidence of major complications (Clavien-Dindo grade ≥3) in TXA groups was between 0%–14.5% vs. 0%–17% in the placebo groups. Differences between TXA administration route (intravenous vs. oral vs. spray) and dosage (single dose vs. loading and maintenance) were not assessed due to heterogeneity between studies.
Conclusions: TXA may be a useful and appropriate perioperative medication to reduce blood loss and transfusion rates in urological procedures; however, there is still a need to determine the most effective TXA admin-

Author	Study Design	Surgery Type	Group	n	EBL, mL (SD)	BTR, n (p value)	Hb change, g/dL (SD)	OT, mins (SD)	LOS, days (SD)
Balik et al. 2020	RCT	RP	TXA	50	93 (NR)	NR	2.25 (NR)	NR	NR
			Control	50	97 (NR)	NR	2.43 (NR)	NR	NR
Bansal et al. 2017	RCT	PCNL	TXA	200	154.55 (47.23)	10	1.71 (0.89)	68.45 (37.23)	2.13 (0.87)
			Control	200	87.62 (29.41)	25 (0.0123)	2.67 (1.23)	87.62 (29.41)	3.39 (1.42)
Carlos et al. 2020	RCT	PCNL	TXA	NR	NR	2.20%	NR	NR	NR
			Control	NR	NR	9.5% (0.032)	NR	NR	NR
Cauni et al. 2017	PC	PCNL	TXA	51	NR	NR	1.1 (NR)	71.5 (NR)	NR
			Control	53	NR	NR	2.3 (NR)	83 (NR)	NR
Crescenti et al. 2011	RCT	RP	TXA	100	1103 (500.8)	34	2.9 (NR)	166 (44)	9 (4.3)
			Control	100	1335 (686.5)	55 (0.004)	3.1 (NR)	159 (40)	9 (4.3)
Iskakov et al. 2016	PC	PCNL	TXA	82	NR	2	1.142 (0.015)	107 (5.4)	9.14 (0.3)
			Control	82	NR	10 (<0.05)	2.276 (0.37)	119 (5.3)	10.08 (0.5)
Karkhanei et al. 2020	RCT	TURP	TXA	35	NR	0	0.29 (NR)	53.57 (16.43)	NR
			Control	35	NR	3 (<0.05)	1.22 (NR)	120.71 (47.76)	NR
Kumar et al. 2013	RCT	PCNL	TXA	100	NR	2	1.39 (NR)	48.3 (NR)	2.74 (1.06)
			Control	100	NR	11 (0.018)	2.31 (NR)	70.8 (NR)	4.67 (3.08)
Meng et al. 2019	RCT	TURP	TXA	30	102 (11.4)	NR	1.39 (NR)	101.7 (8.9)	15.9 (5.2)
			Control	30	303.6 (24.8)	NR	2.14 (NR)	89.7 (5.2)	13.9 (3.9)
Mittal et al. 2018	RCT	TURP	TXA	30	145.4 (13)	0	0.81 (0.4)	49.5 (5.31)	3 (0)
			Control	30	197.5 (17.8)	0 (NR)	1.46 (0.37)	50.1 (4.21)	3 (0)
Moham-madi et al. 2018	RCT	PCNL	TXA	60	441.15 (NR)	NR	1.52 (NR)	NR	4.27 (NR)
			Control	60	587.5 (NR)	NR	2.66 (NR)	NR	4.05 (NR)
Pourfakhr et al. 2016	RCT	RP	TXA	93	340 (NR)	0	1.9267 (1.0288)	75 (NR)	NR
			Control	93	515 (NR)	5 (<0.05)	1.9533 (1.2582)	80 (NR)	NR
Rannikko et al. 2004	RCT	TURP	TXA	70	128 (NR)	6	1.2 (NR)	36 (NR)	3 (NR)
			Control	66	250 (NR)	5 (0.709)	1.7 (NR)	48 (NR)	3 (NR)
Siddiq et al. 2017	RCT	PCNL	TXA	120	NR	4	1.3 (NR)	85 (NR)	4 (NR)
			Control	120	NR	12 (0.038)	1.6 (NR)	90 (NR)	4 (NR)
Zaid et al. 2016	PC	RC	TXA	103	650 (NR)	32	NR	278 (NR)	NR
			Control	200	650 (NR)	115 (<0.0001)	NR	(NR)	NR

RCT, randomized controlled trial; PC, prospective cohort; n, sample size; NR, not reported; RP, radical prostatectomy; PCNL, percutaneous nephrolithotomy; TURP, transurethral resection of prostate; RC, radical cystectomy; EBL, estimated blood loss; BTR, blood transfusion rate; OT, operative time; LOS, length of stay

Poster #29. Table 1. Study characteristics and select outcomes.

istration route and dose. This review provides evidence-based data for decision-making in urological surgery and creates clinical equipoise for the development of comparative studies of TXA use in urological procedures.

Poster #30

Telemedicine in urology: The patient experience

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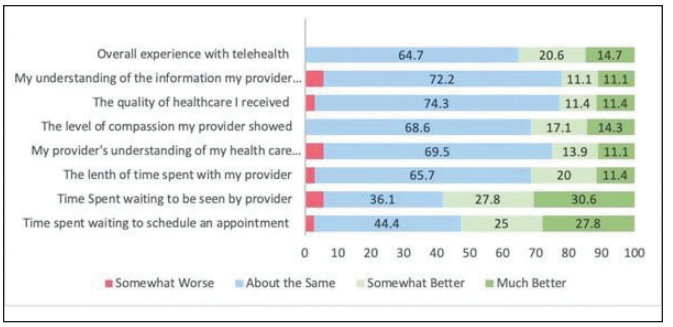
Introduction: Due to COVID-19, telemedicine has become a common method of healthcare delivery. Our goal was to evaluate urology patient satisfaction with telemedicine and identify opportunities for improvement in telemedicine readiness, access, quality of care, and to examine patient preferences.

Methods: A total of 285 adult urology patients who completed at least one telemedicine visit from September to December 2020 were selected at random. A paper survey was disseminated by mail which could be returned electronically or via mail. Subjects received a $15 gift card.

Results: This is an ongoing study. To date, 54 patients completed the survey (response rate 20.8%). The most common age bracket was 70–79 years (37.5%). Nearly all, 92.5% of respondents, were white and 77.5% were males; 17.5% live >40 minutes away from the office. All respondents had health care insurance: 52% Medicare, 45% private insurance, and 2.5% Medicaid. 1) Readiness: To prepare for the visit, most patients (50.8%) read the provided instructions and 8.8% downloaded platform software. 91.9% of patients thought they were adequately prepared. 78.9% were either satisfied or very satisfied with the ease of setup. 2) Access: Most respondents (83.8%) did not have difficulty accessing the visit. Those who reported a difficulty attributed it to the provider having difficulties and lack of familiarity with the technology. Types of visits included established patients (86.4%) and new patient visits (13.6%). 3) Quality of care: Wait times were short: 45% waited 0–5 minutes. All respondents were satisfied or better with the length of visit, and 88.9% were satisfied or very satisfied with the overall experience. 4) Patient preferences: Compared to office visits, most patients find telemedicine equal or superior in several areas (Fig. 1). Despite the positive experience, 37.5% would prefer to see a provider in person. This would be dependent on the nature of the complaint, length of drive and the patient's schedule. Patients' preference for in-person visits is driven by the perception that they would receive higher quality of care and were able to be examined.



Poster #30. Fig. 1. Comparing the patient telemedicine experience with in-person visits.

Conclusions: Patients report high levels of satisfaction and a willingness to engage with telemedicine visits. Despite the positive experience many patients still prefer in-patient visits. Some patients also reported that providers were inadequately prepared for the telemedicine visits.

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Poster #31

Using a multipronged behavioral intervention to standardize antibiotic prophylaxis at the time of Foley catheter removal after radical prostatectomy

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Introduction: The use of prophylactic antibiotics at the time of Foley catheter removal after radical prostatectomy remains controversial, with mixed evidence to support its use and no specific guidelines available. We aim to identify antibiotic prescribing patterns at the time of foley catheter removal after radical prostatectomy and utilize a multi-pronged behavioral intervention to standardize antibiotic use.

Methods: We implemented a single-institution, single-arm, pre- and post-intervention study examining the prescribing of antibiotics at the time of Foley catheter removal after radical prostatectomy. First, in the pre-intervention phase, we examined antibiotic use and infection rates among patients undergoing Foley catheter removal after radical prostatectomy over a six-month period. Based on this baseline data and existing literature, we developed a standardized antibiotic protocol; a single dose of an oral antibiotic of the surgeon's choice to be taken at the time of Foley catheter removal. Second, in the intervention phase, we implemented a three-pronged behavioral intervention over a 10-month period. This included grand rounds education, monthly compliance and infection reports, and individualized feedback meant to increase surgeon compliance of the standardized antibiotic protocol.

Results: A total of 326 patients were included in the study: 132 in the pre-intervention phase and 194 in the intervention phase. Prescribing patterns varied by surgeon in the pre-intervention phase and ranged from no antibiotics to 10 doses. Surgeon compliance with the standardized antibiotic protocol was 58.3% in the pre-intervention phase and 89.7% in the intervention phase (p<0.001.) The mean number of antibiotic doses per patient decreased from 2.9 in the pre-intervention phase to 0.9 in the intervention phase (p=0.006). The rate of 30-day urinary tract infection (UTI) did not significantly differ across the two phases, 3.8% vs. 3.1% (p=0.73). No patient developed sepsis or required hospitalization as a result of a UTI.
Conclusions: Prophylactic antibiotic use at the time of Foley catheter removal after radical prostatectomy varied among urologists at our institution. A multipronged behavioral intervention resulted in a high rate of surgeon compliance with the standardized antibiotic protocol. This led to a significant reduction in antibiotic use with no change in the rate of 30-day UTI after Foley removal.
Funding: Bruce L. Jacobs, MD MPH is supported in part by the Shadyside Hospital Foundation.

Poster #32

Staged urethroplasty for reconstruction of long and complex penile strictures of a neophallic urethra

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Introduction: Post-phalloplasty, patients may present with urologic complications, including urethral strictures, urethrocutaneous fistulae, and fistulae to a previously obliterated vaginal cavity. Our objective is to demonstrate the feasibility of staged repairs for long and complex penile strictures to improve functional outcomes and quality of life.
Methods: A retrospective review of all patients who underwent a neophallus urethroplasty was performed. Patients with long (>7 cm) penile strictures were included. During stage 1 of the repair, a ventral incision through the perineum and neophallus was created to expose remnants of the neo-urethral plate. Additional pathology was treated at this stage if found, including redo-vaginectomy, abscess drainage, fistula excision, and foreign body removal. The urethral plate was augmented with buccal mucosal graft (BMG). The lateral edges of the augmented urethral plate were then sutured to the edges of the skin incision creating a temporary perineal urethrostomy. Stage 2 was performed in a delayed fashion and included tubularization of the neourethra, with additional BMG inlay, if needed. A multi-layer closure was then completed.
Postoperatively, patients were assessed for urethral patency and queried using patient-reported outcome measures (PROMs).
Results: Between December 2014 and April 2021, a total of 20 patients presented with obstruction due to long penile strictures of the neophallic urethra, and 16 elected to undergo staged reconstruction to achieve upright voiding. All patients had history of vaginectomy, 14/16 had prior radial forearm free flap phalloplasty (RFFFP) and 2/16 had prior anterolateral thigh (ALT) flap phalloplasty. Mean age was 33 years (22–58) and mean stricture length was 12 cm (7–17). Concurrent procedures during stage 1 included re-harvesting BMG that was used in the initial phalloplasty (10/16), gracilis flap re-mobilization (8/16), redo-vaginectomy (5/16), and removal of foreign body (2/16). At a mean followup of 17 months (1–70), there were two failures (14%) among the 15 patients who completed the staged repair (the remaining patient is awaiting stage 2). Ten patients with successful reconstruction completed followup questionnaires: nine reported upright voiding and all reported an overall improvement in their condition on Global Response Assessment (GRA): 8/10 (+3) and 2/10 (+2).
Conclusions: A staged urethroplasty is a feasible option for transgender men with long and complex penile strictures of the neophallic urethra. This technique demonstrates promising early surgical success rates and high patient satisfaction.

Education, Laparoscopy, Robotics and Surgical Innovation

Poster #33

Influence of the COVID-19 pandemic on the burnout rates of graduating Canadian Urology residents

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Introduction: Burnout is a work-related psychological syndrome characterized by emotional exhaustion, decreased sense of personal accomplishment, and depersonalization. Burnout among surgeons is increasing with prevalence rates exceeding 50%. COVID-19 has affected the medical system with evidence of increased stress and levels of depression in our medical trainees This study aims to assess the influence COVID-19 is having on burnout rates in Canadian urology trainees.

Methods: Thirty-seven chief residents among the Canadian urology residency programs attended the Queen's Urology Exam Skills Test (QUEST) in December 2019 pre-pandemic and 39 chief residents attended virtually on November 2020 during the pandemic. The Maslach Burnout Inventory (MBI) questionnaire was administered anonymously. The MBI covers emotional exhaustion, depersonalization, and personal accomplishment. Descriptive statistics were used to analyze the data.

Results: There was 100% response rate in the convenience sample (n=37) in 2019 and 64.1% response rate (n=25) in 2020. Seventy percent of chief residents in Canadian Urology programs showed evidence of burnout in 2019 compared to 88% in 2020. There was a statistically significant difference between the two cohorts in emotional exhaustion (45.9% in 2019 and 68% in 2020, p=0.005) and depersonalization scores (62.2% in 2019 and 80% in 2020, p=0.02).

Conclusions: This study is the first to examine the impact of the pandemic on burnout rates in Urology trainees. Burnout rates are high in trainees at baseline, and the pandemic appears to have exacerbated this problem. Vigilance and proactive steps need to be implemented to alleviate this crisis.

Poster #34

SimCAP: simulated capped application process for urology applicants

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Introduction: Over time, the urology residency application process has become increasingly expensive and inefficient. The average number of applications submitted by urology applicants rose to 77 in 2021, a 45% increase from 2013. On the flip side, programs received an average of 282 applications, about 114 applications per vacant residency position. The large number of applications results in extra expense and effort for applicants and programs. In this study we examined the impact that a hard cap on residency applications would have had on the urology match in 2021.

Methods: This is a cross-sectional study involving surveys completed by urology applicants before and after the 2021 match cycle. The surveys were disseminated to applicants through program directors and social media. Data collected included applicant demographics, feelings towards application caps, and a pre-application list of the 25 programs the applicant would have chosen if there had been a hard cap on application submissions. E-mail addresses were used to follow up with applicants post-match on their feelings about a hard cap as well as to determine if they had matched at a program in their theoretical hard cap list.

Results: One hundred fifteen urology applicants completed the first survey, submitting 2875 simulated applications, and 90 of those applicants completed our post-match followup survey. When compared to the demographics of the 2021 urology application pool based on AUA data, our sample included proportionally more female applicants (43.3% vs. 29.3% [p=0.01]) and a similar proportion of IMG applicants (5.5% vs. 6.8% [p=0.65]). After completing the match, 55.6% of applicants were supportive of a hard cap of 25 on the number of programs applicants can apply to. Unmatched applicants trended to be more likely than matched applicants to favor applications caps (76.9% vs. 51.9% [p=0.09]). Of the applicants that matched to a urology program in our study, 84.4% matched to one of the 25 programs they submitted a simulated application to, including 100% of both IMG and DO applicants, and 90.9% of African American or Hispanic applicants.

Conclusions: The vast majority of matched urology applicants ended up at programs they would have applied to if applications were limited. This was even more true of IMG, DO and under-represented minorities. Although 44% of applicants had concerns about limiting applications, our data suggest that limiting applications would be unlikely to produce significant changes to the match results.

Poster #35

Intermediate-length followup of single-port laparoscopic renal cryoablation

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Introduction: Renal cryoablation has become established as a safe and efficacious therapy for small renal lesions when performed laparoscopically and percutaneously. The laparoscopic approach is associated with improved efficacy relative to percutaneous ablation but with higher risk of surgical toxicity. We have developed a minimally invasive retroperitoneal technique with a single-port gel device that reduces toxicity while maintaining oncologic efficacy. We report the intermediate length followup of a continuous, prospectively collected database.

Methods: A series of 54 patients were placed into standard lateral decubitus position with a 2–3 cm incision made beneath the twelfth rib. The retroperitoneal space was developed with balloon dissection and a GelPOINT Mini (Applied Medical) inserted. A percutaneous biopsy was performed under US guidance prior to placement of cryoprobes into the mass. All procedures were performed as outpatient under IV anesthesia without narcotics. Patient demographics, tumor characteristics, oncological followup, and disease-free and overall survival data were evaluated.

Results: A total of 54 patients, with a median followup of 23 months (range 1–44), were identified. Median tumor size was 3.4 cm (1.5–7.2), ASA score was 3, CCI was 5 (2–9), RENAL score was 7 (4–10), and 61% carcinoma on biopsy. Four (8.5%) patients had a solitary kidney. An average of 2.6 cryoprobes were used. Two cases were performed as salvage following previous partial nephrectomy (PN). There were three perioperative adverse events (Clavien 1 and 2) without evidence of acute renal injury or bowel injury. There were four instances of disease recurrence, occurring at 18, 30, and 34 months. At the median followup of 23 months, overall survival was 96.3%, disease-specific survival was 100%, and disease-free survival was 96.3%. There were three deaths during a followup period of 36 months,

and one from renal cell carcinoma at 34 months. At 36 months, overall survival was 90.9%, disease-specific survival was 90.9%, and disease-free survival was 90%.
Conclusions: A single-port retroperitoneal dissection for renal ablation is safe and effective as initial therapy for small masses of any location. The procedure can be performed as salvage following a prior PN or ablation. This approach is associated with minimal surgical toxicity, without measurable renal dysfunction. The overall and disease-specific survival at 23 months is highly favorable relative to established ablative approaches. This retroperitoneal approach should be considered for all patients undergoing excision of a small renal mass.

Poster #36

The COVID urology match: Characteristics and outcomes of successful applicants in 2021

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Introduction: Urology residency is highly competitive, and the 2021 match rate of 74% was the lowest in five years. It is unclear whether this is a result of COVID-related disruptions or due to other factors, such as increased interest in urology. Only 34% of applicants surveyed preferred virtual interviews, and many expressed concerns about match outcomes in the months prior. Unfortunately, applicant data are scarce compared to those published by other specialties. Our aim was to describe the characteristics and outcomes of recently matched urology applicants.
Methods: The popular Urology Match Google spreadsheet was accessed in February 2021 and reviewed to summarize anonymous, crowdsourced, self-reported data for matched applicants, including a complete match list for all residency programs. Results were compared to historical data published by the AUA.
Results: Of 198 matched applicants with data, 64 (18%) matched at their home program while 32 (9%) matched where they completed an away rotation. Six of 143 (4%) programs matched all home students. Of 83 matched applicants with data, 73 (88%) were US allopathic seniors, eight (10%) were osteopaths, two were foreign grads, and 20% had no home residency program. Additional data are displayed in Table 1. USMLE scores were consistent with prior reports and >70% sent Step 2 CK scores to programs. Most matched applicants were in the top class quartile, with 39% earning AOA status. On average, matched applicants had four published articles and nine other research items. They completed two urology sub-internships at home or away sites and applied to 80 programs. Matched applicants received 19 interviews, two to three being from the waitlist, and attended and ranked 15. Over half matched in their top two choices, with 83% in their top five. Eleven percent matched from a waitlist interview and 21% matched at a program ranked lower than their home/away rotation sites.
Conclusions: In an unprecedented academic year and application cycle, matched urology applicants remained highly competitive and obtained their desired programs even while completing fewer away rotations. Interview metrics were not notably higher than in prior years, despite concerns of virtual interviews leading to inflation and hoarding. A significant minority matched from the waitlist, lending support to the new interview invitation process's utility.

Characteristic	Average	Median (IQR)	Range
Step 1 Score	244.9	247 (18.5)	208 - 268
Step 2 CK Score	253.6	253 (17)	230 - 274
Class Quartile [a]	1.5	1 (1)	1 - 4
Peer-Reviewed Publications [b]	4.3	4 (3)	0 - 19
Posters, Podiums, Other Publications	8.9	7 (6)	0 - 50
Urology Sub-I Rotations Completed [c]	1.9	2 (2)	0 - 4
Programs Applied To	79.7	77 (38.5)	10 - 139
Total Interview Offers Received	18.8	18 (12)	2 - 50
Interview Offers from Waitlist	2.7	2 (3)	0 - 14
Interviews Attended	15.0	15 (8)	2 - 31
Programs Ranked	14.8	15 (8.5)	2 - 28
Rank List Position Matched	3.3	2 (3)	1 - 15

Characteristic	Percent
No Home Residency Program	19.8%
Member of AOA [d]	38.6%
Step 2 CK Score Sent to Programs	72.3%
Matched from Waitlist Interview Offer	10.8%
Matched Below Home/Sub-I [e]	20.7%

Abbreviations: AOA, Alpha Omega Alpha. AUA, American Urological Association. CK, clinical knowledge. Sub-I, sub-internship.
[a] Quartile 1 indicates top 25% of class rank, 4 indicates bottom 25%.
[b] Includes only full articles, excluding published abstracts.
[c] Includes both home program and away rotations, for those eligible to complete them.
[d] 15.7% of respondents did not have an AOA designation offered by their medical school.
[e] Indicates that applicant matched at a program which they ranked lower than all programs where they rotated, including both their home residency program and any away rotations completed.

Poster #36. Table 1. Self-reported characteristics and outcomes of matched urology applicants in 2021 AUA match year.

Poster #37

Extraperitoneal vs. transperitoneal approach for robot-assisted radical prostatectomy: An updated systematic review and meta-analysis

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Introduction: Extraperitoneal RARP (EP-RARP) has recently become a popular surgical approach and is often compared to the transperitoneal RARP (TP-RARP). We conducted a systematic review and meta-analysis of the available literature to evaluate the differences in perioperative characteristics, oncological and functional control, and surgical complications between EP-RARP and TP-RARP.
Methods: A comprehensive search of PubMed, Embase, Cochrane Central Register of Controlled Trials (CENTRAL), *ClinicalTrials.gov*, Google Scholar, and select conference abstract publications was performed for eligible studies comparing outcomes between EP-RARP versus TP-RARP. This was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and was prospectively registered with PROSPERO. A leave-one-out sensitivity analyses was performed to control for heterogeneity and risk of bias.
Results: A total of 16 studies (three randomized controlled trials, five prospective, and eight retrospective studies) were included with a total pooled population of 3897 patients, including 2201 (56.5%) EP-RARPs and 1696 (43.5%) TP-RARPs. When compared to TP-RARP, EP-RARP offers faster operative time (MD -14.4 minutes; 95% CI -26.3, -2.3; p=0.02), decreased length of postoperative stay (MD -0.9 days, 95% CI -1.3, -0.4, p<0.0001), decreased rates of postoperative ileus (RR 0.2, 95% CI 0.1, 0.7, p=0.009), and inguinal hernia formation (RR 0.2, 95% CI 0.1, 0.5, p=0.001). There were no significant differences in total complications, estimated blood loss, positive surgical margins, or urinary continence at six months post-RARP.
Conclusions: Based on the available evidence, EP-RARP delivered similar oncological and functional outcomes, while also offering faster operative time, decreased length of postoperative stay, and decreased rates of postoperative ileus and inguinal hernia formation when compared to the TP-RARP. These findings provide evidence-based data for surgical approach optimization and prompts future research to examine whether these findings hold true with recent advances in single-port RARP and outpatient RARP.

Poster #38

Virtual OSCE examinations during COVID-19: A 360 satisfaction assessment from examiners and candidates

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Introduction: The COVID-19 pandemic has led to major changes in the healthcare system, including medical education. In order to limit face-to-face interactions, teleconference mediums have been widely adopted for the delivery of curriculums, as well as examinations. The Queen's Urology Exam Skills Training (QUEST), an annual mock examination aimed at simulating the Royal College of Physicians and Surgeons of Canada (RCPSC) for chief residents across Canada, was moved to an online format for this year's cohort. This exam consists of an Objective Structured Clinical Examination (OSCE), as well as a written multiple-choice examination. Our study aimed to assess both examiners' and candidates' experiences and satisfaction with a teleconference format for the OSCE component of the examination.

Methods: A survey was sent to all examiners and candidates following the QUEST examination in December 2020. The Telemedicine Satisfaction Questionnaire (TSQ), a previously validated tool for clinical encounters with three sub-domains (quality of care provided, similarity to face-to-face encounter, and perception of the interaction), was modified for the purposes of evaluating the OSCE encounter. The survey includes 14 questions which are all answered using a five-point Likert scale.

Results: There were 14/16 responses from examiners (87.5%) and 24/39 responses from candidates (61.5%). Overall, the online format was judged to be a good experience by 13/14 (92.9%) examiners and 21/24 (87.5%) candidates. However, when asked specifically if the virtual OSCE was an acceptable way to determine a candidate's competency to practice urology independently, only 8/14 (57.1%) examiners and 15/24 (62.5%) candidates agreed.

Conclusions: This study demonstrates an overall good satisfaction rate among both examiners and candidates when using a teleconference format for an OSCE aimed at simulating the RCPSC examination. Further research is needed to determine ways of optimizing the virtual delivery of an OSCE should this method be used for licensing purposes moving forward.

Poster #39

Clinical utility of Iris for preoperative surgical planning and intraoperative navigation for robotic-assisted partial nephrectomy (RAPN)

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Introduction: Three-dimensional models of patient-specific anatomy are increasingly used to evaluate anatomy in pre- and intra-operative settings. Iris (Intuitive Surgical Inc., Sunnyvale, CA) is an interactive software that allows for functional manipulation of patient-specific 3D anatomical models before and during Robot-Assisted Partial Nephrectomy (RAPN). The objective of the study was to evaluate the clinical utility of Iris for preoperative surgical planning and intraoperative navigation during RAPN.

Methods: Fifteen patients scheduled for RAPN were enrolled. Iris was used preoperatively for surgical planning on an iOS device and intraoperatively on the Da Vinci surgical system using TilePro input. For each case, participants were surveyed on the value of Iris for interpretation of anatomy and for procedure efficiency. Concordance between the preoperative planned clamping technique and the actual clamping performed operatively was evaluated.

Results: Mean (± SD) age, BMI, RENAL nephrometry score, and tumor diameter were 62 (±13.8) years, 31 (±5.6), 7.4 (±2.2), and 29.6 mm (± 15.3), respectively. Twenty percent of the tumors were at the hilar location. Forty-seven percent of the patients had a RENAL score of 7–9, 33% had RENAL score 4–6, and 20% had 10–12. Average blood loss and average ischemia time were 139 (±118.6) mL and 18.3 (±9.1) minutes, respectively. During preoperative planning all surgeons rated that Iris helped achieve good spatial sense of the anatomy. In cases with higher nephrometry scores, 100% of participants agreed that Iris was helpful for preoperative planning. In all cases, all participants agreed that Iris was helpful for intraoperative navigation. In 73% of cases, participants reported improved procedure efficiency when using Iris. In 93% of these cases this was attributed to ease in interpreting anatomy. 80% of participants spent an average of <5 minutes reviewing Iris (Table 1). In 13 of 15 cases, a high degree of overlap was found between preoperatively planned clamping techniques and the actual operative clamping technique. In five cases, surgeons were able to perform super selective or off-clamp technique.

	RENAL score 4-6 (N=5)	RENAL score 7-9 (N=7)	RENAL score 10-12 (N=3)	Total N=15
Preoperatively time spent to visualize, assess and interpret the IRIS 3D model with CT scan				
<1 minutes	3 (60.0%)	2 (28.6%)	0 (0%)	5 (33.3%)
2-3 minutes	2 (40%)	3 (42.9%)	3 (100%)	8 (53.3%)
5 minutes	0 (0%)	2 (28.6%)	0 (100%)	2 (13.3%)
Preoperatively, IRIS helped achieve a good impression (spatial sensation) of the anatomy (At least one rating is >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Tumor location (rating >4)	4 (80%)	7 (100%)	3 (100%)	14 (93.3%)
Tumor depth (rating >4)	4 (80%)	7 (100%)	3 (100%)	14 (93.3%)
Renal artery (rating >4)	5 (100%)	7 (100%)	3 (100%)	14 (93.3%)
Renal vein (rating >4)	4 (80%)	7 (100%)	3 (100%)	15 (100%)
Relationship to structures (rating >4)	3 (60%)	7 (100%)	3 (100%)	13 (86.7%)
Intraoperatively time spent to visualize, assess and interpret the IRIS 3D model with CT scan				
<1 minutes	3 (60.0%)	0 (0%)	0 (0%)	3 (20%)
2-3 minutes	0 (0%)	5 (71.4%)	1 (33.3%)	6 (40%)
<5 minutes	2 (40%)	1 (14.3%)	0 (0%)	3 (20%)
5-10 minutes	0 (0%)	1 (14.3%)	2 (66.7%)	3 (20%)
Intraoperatively, IRIS helped achieve a good impression (spatial sensation) of the anatomy (At least one rating is >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Tumor location (rating >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Tumor depth (rating >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Renal artery (rating >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Renal vein (rating >4)	5 (100%)	7 (100%)	3 (100%)	15 (100%)
Relationship to structures (rating >4)	4 (80%)	7 (100%)	3 (100%)	14 (93.3%)
Intraoperatively, IRIS 3D model with CT scan made my procedure efficient (Rating> 4)	4 (80%)	6 (85.7%)	3 (100%)	11 (73.3%)
Intraoperatively, IRIS 3D model with CT scan allowed identification of target anatomy in procedure				
Easy (intuitive)	5 (100%)	7 (100%)	3 (100%)	14 (93.3%)
Fast (efficient)	4 (80%)	7 (100%)	3 (100%)	14 (93.3%)

Poster #39. Table 1.

Conclusions: This is the first study to explore the clinical utility of Iris. The interactive and accurate representation of complex anatomy afforded by Iris created a perceived increase in surgical efficiency from enhanced ease of anatomy interpretation compared with preop CT alone.

Funding: Intuitive Clinical Trial.

Poster #40

Evaluating the efficacy of virtual urology residency interviews from the applicant perspective

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Introduction: Due to the COVID-19 pandemic, the Association of American Medical Colleges (AAMC) recommended that all residency interviews be conducted on virtual platforms. Calls for greater implementation of virtual interviewing technology have grown out of concern for rising costs — which may disproportionately affect underrepresented minorities — heavy time commitments, and geographic bias. Potential barriers to the implementation of virtual interviews include an inability for students to assess core factors like resident satisfaction, camaraderie, and the "feel" of programs and their geographic locations. This universal transition to virtual interviews allows for a large-scale assessment of virtual interview effectiveness. We hypothesize that urology applicants were not able to adequately assess core factors of residency programs while endorsing a decreased financial and time burden associated with virtual interviews.

Methods: A 38-question survey was sent to all 349 urology applicants to a single program in the year 2020, with IRB exemption. Responses were anonymously collected for four weeks with reminder emails sent weekly. We tabularized responses, calculated percentages for each, and qualitatively analyzed open-ended responses.

Results: Out of 349 survey recipients, we received 34 completed surveys (9.7%). Overall, 55% of respondents were satisfied or strongly satisfied with

virtual interviews. Most respondents had high-quality interactions (agree or strongly agree) with faculty and residents (71.4% and 60%, respectively). Twenty-eight percent of respondents were able to adequately assess the geographic location of programs; geographic location was among the three most important considerations of 70% of respondents. Over half, 58.8% of respondents, reported saving over $5000, and 52.9% reported saving 11 or more days with virtual interviews; 44% of respondents believed that the benefits of money and time saved outweigh the downsides of virtual interviews. Three of six (50%) free-text responses highlighted interest in a hybrid system of virtual and in-person experiences.
Conclusions: Largely, applicants were able to adapt to virtual interviews and assess core factors of residency programs while saving significant money and time. Geographic location was the most important consideration for students when selecting where to apply, while the "feel" of geographic location was the factor least able to be assessed. The survey results indicate virtual interviews are a viable option for future application cycles, offering cost savings — which may help reduce the burden of socioeconomic disparities — at the expense of experiencing the "feel" of a program. Providing in-person experiences (i.e., second-look events) may help address this issue.

Poster #41

WATER vs. WATER II: Three-year comparison of Aquablation therapy for benign prostatic hyperplasia in 30–80 cc prostates and 80–150 cc prostates

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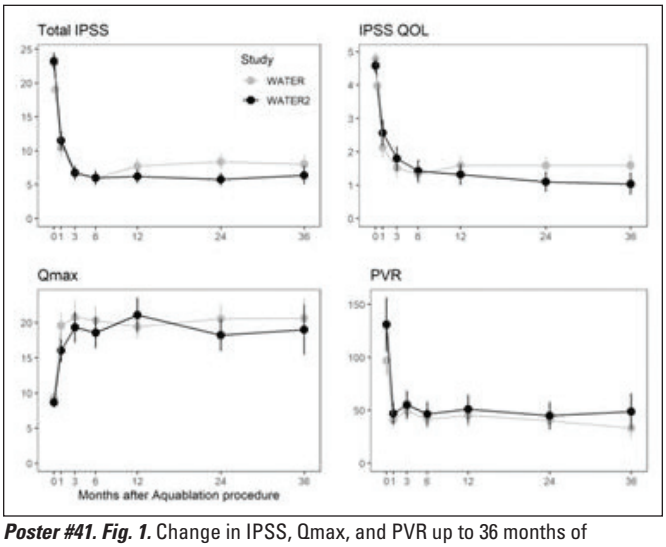
Introduction: Surgical options are limited when treating large (>80 cc) prostates for lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH). Open simple prostatectomy remains the most common procedure performed for large prostates. As such, there is a need for novel surgical approaches with shorter learning curves and effective treatment. Aquablation (AquaBeam System, PROCEPT BioRobotics, Inc., U.S.), an ultrasound-guided, robotically executed waterjet ablative procedure, could fill this gap. This analysis compares the outcomes of Aquablation in 30–80 cc prostates with the outcomes in 80–150 cc prostates.
Methods: WATER (NCT02505919) is a prospective, double-blind, multicenter, international clinical trial comparing the safety and efficacy of Aquablation and TURP in the treatment of LUTS/BPH in men 45–80 years old with a prostate between 30 cc and 80 cc. WATER II (NCT03123250) is a prospective, multicenter, single-arm international clinical trial of Aquablation in men with a prostate between 80 cc and 150 cc. We compare 36-month outcomes among 116 WATER and 101 WATER II study subjects undergoing Aquablation. Student's t-test or Wilcoxon tests were used for continuous variables and Fisher's test for binary variables.
Results: International Prostate Symptom Score (IPSS) scores improved from 22.9 and 23.2 at baseline in WATER and WATER II, respectively, to 8.0 and 6.4 at 36 months, with 36-month reductions of 14.4 and 16.7 points, respectively (p=0.07 for difference in change scores). At baseline, urinary flow rate (Qmax) was 9.4 and 8.7 cc/sec in WATER and WATER II, improving to 20.6 and 19.0 cc/sec, respectively (p=0.70 for difference in change scores) at 36 months. Improvements in both IPSS and Qmax were immediate and sustained throughout followup. Change in IPSS, Qmax, and postvoid residual (PVR) can be found in Fig. 1.
Conclusions: Aquablation clinically normalizes outcomes between patients with a 30–80 cc prostate and patients with an 80–150 cc prostate treated for LUTS/BPH. It is effective in patients with large prostate glands (>80 cc) with acceptable complications out to three years.
Funding: WATER and WATER II are funded by Procept BioRobotics.



Poster #41. Fig. 1. Change in IPSS, Qmax, and PVR up to 36 months of followup.

Poster #42

Surgeon experience informs response to bleeding in robotic surgical simulation

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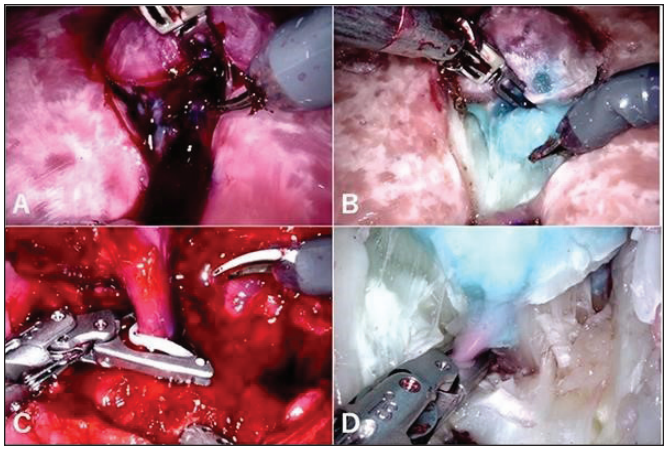
Introduction: Surgical simulation is a key element of many surgical residency training programs. Increasingly, life-like simulation experiences create enhanced opportunities for the development of surgical skill. This study examines the effect of including life-like perfusion in physical surgical simulators designed for use with robotic platforms by comparing stress response (mean pupil diameter) between experienced and inexperienced trainees on otherwise identical models with and without simulated bleeding.
Methods: Eight residents (<5 robotic cases) and eight faculty (>50 robotic cases) from two institutions completed a simulated resection of a partial nephrectomy tumor from a vascularized bed with two feeding vessels under both perfused and nonperfused conditions. The starting condition was randomized and performance was rated by GEARS and errors (vessel injury, incomplete dissection, and faulty clipping) by two blinded reviewers. Participants wore head-mounted eye trackers (Tobii, Danderyd,



Poster #42. Fig. 1. Dissection of the tumor (green) under ***(A)*** perfused; and ***(B)*** non-perfused conditions. Clipping of pedicle vessel under ***(C)*** perfused; and ***(D)*** non-perfused conditions.

Sweden) during each trial to measure mean pupil diameter (MPD) as an indicator of cognitive load.
Results: The model was able to differentiate between faculty and residents (GEARS, errors, p<0.05) Residents had similar GEARS scores between non-perfused and perfused models (16.6 vs. 15.3, p=0.45) while encountering more errors during the perfused models (11.9 vs. 19.1, p=0.08), with significantly more attempts to clip the vessels (7.4 vs. 14.3, p=0.048) (Fig. 1). Faculty GEARS scores were lower in the perfused models (24.5 vs. 22.1, p=0.03), largely due to decreases in efficiency and force sensitivity scores. However, they remained at a satisfactory overall benchmark (≥22). Faculty also maintained similar errors between models (8.8 vs. 9.4, p=0.88). MPD was normalized to each participant. Most participants had higher MPD during the perfused model, indicating higher cognitive load (63% of faculty, 86% of residents, p<0.001). Vessel clipping demonstrated the most prominent change in MPD (69% of faculty, 79% of residents, p<0.001).
Conclusions: When working on the perfused models compared with the non-perfused models, experts maintain a similar degree of performance despite increased cognitive load. When working on the perfused models, novices demonstrated a loss of performance and an increase in cognitive load. These results support perfusion as a meaningful design element of a surgical simulator and support the hypothesis that expert-level performance is resilient to stressors in ways that novice-level performance may not be.

Poster #43

From multi- to single-port da Vinci platform: Do surgeons' robotic surgery skills transfer seamlessly?

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Introduction: Minimally invasive approaches in urologic surgery are constantly evolving. The recently developed da Vinci single-port (SP) robotic platform is becoming integrated into routine clinical use. The purpose of this study is to examine whether surgical skills developed with the multi-port (MP) robotic platform are readily transferrable to SP surgery.
Methods: Five MP robotic experts (completed >200 cases) and five MP novices (completed <10 cases) without prior SP experiences independently completed a validated ureterovesical anastomosis (UVA) simulation first using the MP and then the SP robot. GEARS and RACE scores were assigned by two blinded reviewers. Objective (galvanic skin response; GSR) and subjective (Surg-TLX [/100] and difficulty ratings [/20] of camera movement, endowrist movement, and avoiding instrument collisions) cognitive load measurements were collected.
Results: Experts achieved significantly greater GEARS and RACE scores on the MP (27 vs. 17.3, p<0.001; 26.9 vs. 15.9, p<0.001, respectively) and SP (24.1 vs. 18.1, p=0.002; 21.8 vs. 16.3, p=0.017) than novices. Experts had significantly higher Surg-TLX (+13 pts, p=0.015) and difficulty ratings using the SP compared to MP (+11.8, p<0.01; +13.6, p<0.01) while novices maintained high Surg-TLX and difficulty scores on both platforms (rating only the SP camera movement to be significantly more difficult; +7.2, p=0.03). GSR demonstrated similar trends. Experts' UVA performance (GEARS and RACE) significantly decreased from MP to SP (27 to 24.1, p=0.047; 26.9 to 21.8, p=0.011, respectively). On subanalysis, experts had significant decreases in GEARS sub-scores of force sensitivity and robotic control (-0.7, p=0.04; -0.9, p=0.02), but maintained subscores of depth perception, bimanual dexterity, and efficiency. RACE subscores of needle entry, needle driving, and tissue approximation (-0.9, p=0.01; -1.0, p=0.02; -1.0, p<0.01) significantly decreased while maintaining sub-scores of needle positioning and suture placement. Both experts and novices were rated significantly lower at the knot tying skill on the SP robot (-1.0, p=0.03; -1.2, p=0.02, respectively).
Conclusions: Only some skills demonstrated by experts on MP were readily transferable to SP robots, suggesting the need for specific training on at least a subset of skills. However, in novices, concurrent SP and MP training may be beneficial.

	Novices			Experts		
	MP	SP	Δ	MP	SP	Δ
Surg-TLX (/100)	31.6	35.6	4	13.1	26.1	13.0*
Camera Movement Difficulty (/20)	8.2	15.4	7.2*	1.4	13.2	11.8*
Endowrist Movement Difficulty (/20)	15.2	17.0	1.8	1.8	15.4	13.6*
Collision Avoidance Difficulty (/20)	13.0	18.6	5.6	1.8	15.8	14*
Total GEARS Score (/30)	17.3	18.1	0.8	27.0	24.1	-2.9*
Depth Perception (/5)	2.7	3.0	0.3	4.5	4.5	0.0
Bimanual Dexterity (/5)	2.6	3.2	0.6	4.5	3.8	-0.7
Efficiency (/5)	2.4	2.2	-0.2	4.2	3.6	-0.6
Force Sensitivity (/5)	2.1	2.3	0.2	4.4	3.7	-0.7*
Robotic Control (/5)	2.5	2.4	-0.1	4.4	3.5	-0.9*
Total RACE (/30)	15.9	16.3	0.4	26.9	21.8	-5.1*
Needle Positioning (/5)	2.7	2.8	0.1	4.5	4.0	-0.5
Needle Entry (/5)	2.6	2.9	0.3	4.6	3.7	-0.9*
Needle Driving & Tissue Trauma (/5)	1.9	2.4	0.5	4.3	3.3	-1.0*
Suture Placement (/5)	2.8	2.9	0.1	4.1	3.4	-0.7
Tissue Approximation (/5)	2.6	3.2	0.6	4.7	3.7	-1.0*
Knot Tying (/5)	3.3	2.1	-1.2*	4.7	3.7	-1.0*

* denotes significance (p≤0.05) between MP and SP

Poster #43. Fig. 1.

Poster #44

Development of a high-fidelity transrectal ultrasound simulation model for resident education

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Introduction: Transrectal ultrasound (TRUS)-guided prostate biopsy is a fundamental urological procedure in prostate cancer diagnosis. Mastery of TRUS requires skills in three-dimensional orientation and real-time interpretation of findings to obtain accurate biopsies while minimizing patient discomfort. TRUS guided biopsy training methods that are accessible and provide realistic feedback outside of live patients are extremely limited. We sought to design a portable, high-fidelity TRUS biopsy simulation model to facilitate resident training.
Methods: A hydrogel model was developed containing a prostate with six colored zones corresponding to the standard targeted biopsy regions (left and right base, mid, and apex), rectum, seminal vesicles, and urethra. Six expert urologists (median cases completed = 550) and six residents completed more than two biopsies of each zone. Various metrics were collected to assess the model, including accuracy and number of biopsy attempts from the correct zone, time to complete each core, and participant feedback on the realism and educational effectiveness of the model as a teaching and skills assessment tool (using free response and five-point Likert scale questions).
Results: When asked how well the model replicated the relevant human anatomy for the procedure, experts and novices rated the model 3.75/5 and 4.5/5, respectively. Both groups rated the model more than four when asked if the overall simulated tissue accurately resembled the appearance of live human tissue. Both groups also rated the model highly (≥4) for procedural realism. In regard to teaching using the model, experts and

novices rated the model highly (≥4), agreeing that the model is useful for improving technical skills, teaching the procedure and assessing the user's ability to perform the procedure. Experts took significantly less attempts and time per biopsy region, less time per attempt, and reported significantly lower perceived difficulty than novices (2.4 vs. 3.7, p=0.001; 59.8 vs. 123.9, p<0.001; 23.3 vs. 31.3, p=0.001; 3.0 vs. 4.8, p=0.001, respectively). However, both groups best core accuracy in each region was similar for all attempts (88% vs. 92%, p=0.31).
Conclusions: This TRUS biopsy model incorporates essential components of instantaneous feedback of procedural metrics while reliably replicating anatomical accuracy and procedural realism for successful inclusion into the resident training curriculum. Owing to its portability and non-biohazardous properties, this TRUS model in combination with merged reality software can serve as a tool for the future of virtual learning.

Poster #45

Expert and trainee perceptions of a high-fidelity hydrogel model compared to the gold standard cadaver model for inflatable penile prosthesis training

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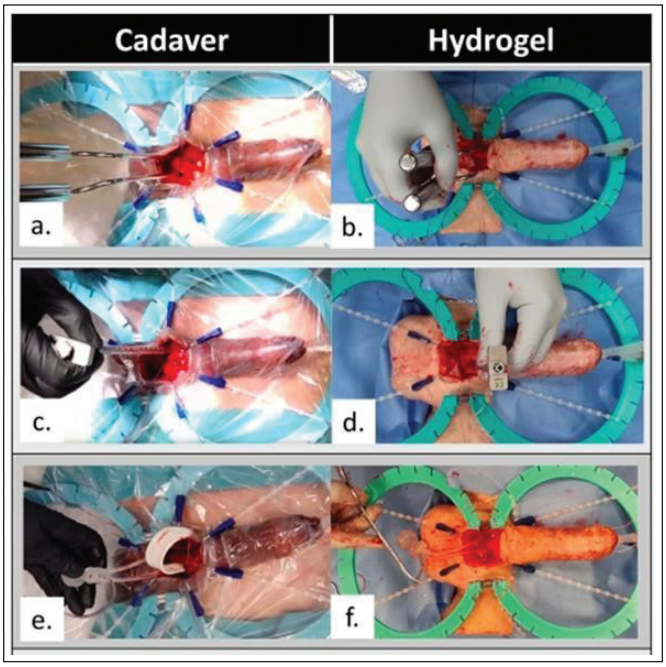
Introduction: Cadavers have traditionally been an integral modality for inflatable penile prosthesis (IPP) placement training. Significant disadvantages of cadaveric simulation include the limited availability and shelf-life of specimens, inherent biohazard risk, and need for specialized facilities. A previously validated high-fidelity, non-biohazardous procedural simulation for IPP placement was developed to address this need. The purpose of this study was to evaluate the performance of the hydrogel model as a training tool for IPP placement compared to the standard cadaveric model.
Methods: Twenty-nine participants (six experts, 11 fellows, and 12 residents) performed guided IPP simulations on both cadaver and hydrogel models (Fig. 1). Surveys were completed to compare the tissue properties, anatomical and procedural resemblance, and educational effectiveness between the two modalities using a five-point Likert scale.
Results: Eighty-six percent of participants agreed the hydrogel training model replicated relevant human anatomy. Overall, 66% agreed that the hydrogel tissues resembled the appearance of cadaveric tissues, and that specifically the skin (86%), pubic bone (79%), corpora (72%), and inguinal canal (42%) resembled the texture and behavior of a cadaver. Most participants (97%) agreed that the model replicated procedural steps in cadavers, particularly the prosthesis measurement and placement (93%), tissue closure (92%), skin/dartos incision (86%), stay suture placement (85%), and corporal dilation (79%). Experts and fellows unanimously found the model useful for improving technical skills, teaching the procedure, and assessing procedural ability. Sixty-seven percent of experts believed that the hydrogel model was equivalent or superior to the cadaver as an educational tool. Seventy-nine percent (83%, 91%, 67% of experts, fellows, residents, respectively) stated they would include the models alongside current cadaver training with 33% of experts stating they preferred hydrogel models overs cadavers.
Conclusions: The hydrogel model is an effective training tool and provides an excellent representation of surgical anatomy compared to a standard cadaver model. The hydrogel model allows for the practice of each step of IPP placement with equivalent fidelity to standard cadaveric simulation. Its non-biohazardous nature provides a safe and effective educational equivalent for IPP surgical training that may supplement or even replace cadaveric simulation in this setting.
Funding: Coloplast Research Grant.



Poster #45. Fig.1. Side-by-side comparison between cadaver and high-fidelity hydrogel model showing anatomical and procedural realism during the following steps: goal post-test (a=cadaver; b=hydrogel); corporal measurement (c=cadaver; d=hydrogel); and IPP placement (e=cadaver; f=hydrogel),

Poster #46

Robotic-assisted combined buccal mucosal graft and advancement bladder flap for prostatic urethral obliteration

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Introduction: Bladder neck contracture is an uncommon yet problematic adverse event following BPH surgery. In its most severe form, complete outlet obliteration can result. In the face of a long segment of obliteration, reconstruction may involve a urethral "pull-through" technique, historically described in the setting of post-traumatic posterior urethral strictures. Alternatively, excision of the intervening segment with primary urethrovesical anastomosis is another management approach; this may require additional maneuvers such as partial prostatectomy. Recently, a robotic-assisted laparoscopic (RAL) subtrigonal inlay of buccal mucosal graft was described for bladder neck reconstruction in the setting of refractory contracture formation. We elaborate on this technique with the addition of an advancement bladder flap to form the anterior plate, opposing a posteriorly positioned buccal mucosal graft, for the treatment of complete prostatic urethral obliteration.
Methods: A 71-year-old male with a history of BPH and detrusor underactivity presented after open simple prostatectomy with urinary retention and bilateral hydronephrosis. Bladder emptying was managed with a suprapubic tube. Retrograde urethrogram (RUG)/voiding cystourethrogram (VCUG) demonstrated complete obliteration from the bladder neck through the prostatic urethra.
Results: The patient underwent a RAL reconstruction with buccal mucosal graft and advancement bladder flap without intraoperative complication. There was no perineal incision or open conversion. He was discharged on postoperative day 1. His urethral catheter was removed at one month, and RUG/VCUG showed no obstruction or extravasation. He voids spontaneously with large residual volumes, for which he performs nightly clean intermittent catheterization. Cystoscopy at most recent followup demonstrated patency and a well-healed posterior buccal graft and anterior advancement bladder flap.
Conclusions: A combined buccal graft and advancement bladder flap is a feasible and effective approach for management of long segment prostatic urethral obliteration. Perineal dissection and urethral transection is avoided, thus preserving urethral blood supply by not compromising the bulbar artery. Additionally, it avoids extirpative surgery with attendant risks of erectile dysfunction and urinary incontinence.
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Endourology and Stones

Poster #47

Not every low-dose is low-dose: Impact of revising low-dose CT protocol on mean effective radiation exposure

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Introduction: According to the American Urological Association imaging guidelines, patients presenting with renal colic should undergo low-dose (LD) rather than standard-dose (SD) non-contrast CT. The aim of the present study was to assess how often physicians ordered LD CT scans and to calculate mean Effective Radiation Exposures (ERE) from CT scans from Dose Length Products (DLP), and determine mean cumulative ERE over one-year followup period.

Methods: After obtaining ethics approval, a retrospective chart review was conducted for patients with renal colic presenting to the emergency department between August 1, 2015 and July 31, 2016 (phase 1) and between April 1, 2019 and October 1, 2019 (phase 2). All imaging studies performed within one-year of initial presentation were catalogued. A two-way ANOVA was used to quantify the effect of imaging modality and hospital center on mean ERE per scan.

Results: In phase 1, 146 patients, with mean age of 51 years and mean BMI of 28.6 kg/m^2, underwent 218 CT scans. In phase 2, 225 patients with mean age of 55 years and mean BMI of 26.7 kg/m^2, underwent 273 CT scans. Urologists were the only physicians ordering LD CT scans and they ordered significantly more LD than SD CT scans (71.3% vs. 28.7%, $p<0.01$). In phase 1, there was no significant difference in mean ERE of LD vs. SD CT scans (6.5 mSv vs. 8.9 mSv, $p>0.05$). In phase 2, after revision of LD CT scan protocol in March 2019, the mean ERE per LD CT significantly decreased (6.5 mSv vs. 2.8 mSv, $p<0.01$). In addition, there were significant differences in mean ERE from LD CT scans between two hospitals in the same health system (1.6mSv vs. 7.8mSv, $p<0.01$). The mean cumulative ERE over one-year period was 19.4 mSv, with 6.9% of patients exceeding 50 mSv.

Conclusions: Although LD CT scans are being ordered, a small percentage of patients continue to exceed the 50 mSv annual threshold. It is important to keep track of mean ERE of LD CT scans and collaborate with medical physicists and the diagnostic imaging department to further refine LD CT scan protocols since not every low-dose is low-dose.

Funding: Claudia Deyirmendjian was supported by an Endourological Society Summer Research Scholarship while working on this project.

Poster #48

Impact of ureteral stents on factors contributing to stricture pathogenesis

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Introduction: Ureteral stenting is common for the management of obstructive uropathy. While much research into complications associated with stents has been completed, none has focused on understanding the molecular response of the ureter to stents, which may drive pain and discomfort. Recent preliminary work suggests that stents trigger pre-fibrotic changes in ureteral tissues. To investigate this concept further, the objective of this work was to evaluate the impact of ureteral stents on pro-fibrogenic signaling associated with stricture pathogenesis.

Methods: Pigs (n=3) were stented unilaterally for 14 days with the unstented side serving as the control. Additional pig ureters (n=3) were stented for 14 days and then allowed to recover for seven days (recovered group). Ureters were analyzed by RNAseq and proteomic analysis to evaluate the presents of pro-fibrotic factors.

Results: RNAseq demonstrated that the stented ureter had increased transforming growth factor (TGF)-β2, and TGF-β-receptor(R)-2 compared with the unstented ureter. Stenting altered Collagen (Col) RNA levels, with increases in Col 8A1, 4A2, 6A5, 1A2, and 3A1, among others, compared to the unstented group. Compared to the stented group, the recovered group had reductions in TGF-β2 and Col 4A2, 6A5, 1A2, and 3A1 RNA expression. Compared to the unstented group, the recovered group had increased expression of Col 12A1, 17A1 and 8A1 RNA and decreased Col 53A and 8A2. Proteomic analysis demonstrated that compared to the unstented group, the recovered group had increased Col 6A2, 6A3, and 7A1 and decreased Col6A6 and 5A3. The recovered group had few differences in protein expression and no changes in Col levels compared to the stented group.

Conclusions: Indwelling stents result in alterations in signaling pathways associated with stricture formation, an effect that has not been reported previously and may contribute to stent-associated ureteral dysfunction, pain, and discomfort. Some of these alterations revert to patterns similar to unstented ureters, while others remain aberrant 7 days after a stent has been removed. Studies investigating whether these changes revert to normal following stent removal or result in longer-lasting decreased ureteral function are warranted.

Funding: Boston Scientific Investigator Initiated Research Grant.

Poster #49

Nephrostomy tube vs. ureteral stent for obstructing septic calculi: A nationwide propensity score matched analysis

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Introduction: Sepsis secondary to obstructive uropathy is a urological emergency associated with significant mortality and morbidity. Urgent decompression using retrograde placement of a ureteric stent (US) or a percutaneous nephrostomy tube (PCN) remains the gold standard of treatment in conjunction with fluid resuscitation and IV antibiotics. Prior literature suggests that advantages to PCN include higher insertion success rate, as well as a shorter procedural time, which may account for the benefit in mortality. However, scant data exists regarding the optimal method for decompression.

Methods: Using the National Inpatient Sample (NIS) database from 2006–2014 we created a cohort of patients ≥18 years of age with a diagnosis of sepsis and a ureteral/renal calculi that underwent US or PCN. A multivariate logistic regression model predicting in-hospital mortality was created incorporating the 29 Elixhauser comorbidities, hemodialysis, shock, and mechanical ventilation. Additionally, a propensity score matched cohort was created based on the propensity to receive each treatment.

Results: Of these, 9828 (28.9%) patients underwent ureteral stenting and 24 181 (71.1%) underwent PCN. The unadjusted mortality rate for US patients was 2.8% compared to 5.3% in the PCN group ($p<0.01$). Patients who received US were more likely to be female (61.7% vs. 53.8%, $p<0.01$),

white (69.3% vs. 64.5%, p<0.01), and have private health insurance coverage (26.5% vs. 20.9%, p<0.01). After adjustment for baseline characteristics, having a US compared to PCN was associated with a lower risk of mortality (OR 0.72, 95% CI 0.63–0.83, p<0.01). After matching patients based on propensity score, the mortality rate for patients who received a US was 3.5% compared to 3.9% in the PCN group (p=0.26).
Conclusions: This large, national analysis demonstrates that US placement in septic obstructive uropathy is associated with lower mortality compared to PCN. After propensity score matching this finding was no longer statistically significant. Further prospective randomized trials are needed to address this important clinical question.

Poster #50

Novel image quality evaluation tool for ureteroscopes: Validation study using four widely available digital ureteroscopes

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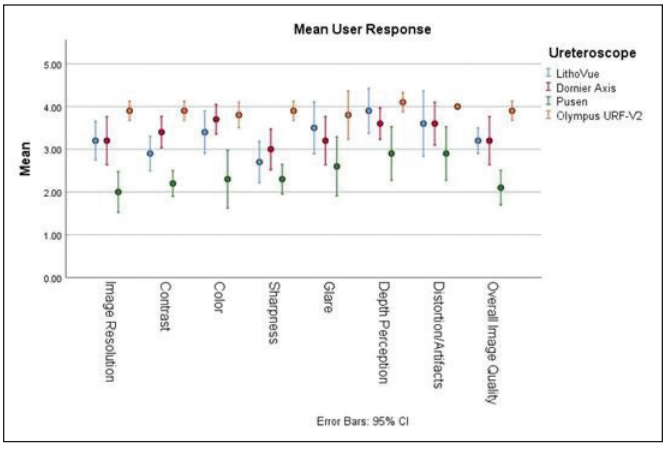
Introduction: We sought to compare the image quality of three single-use ureteroscopes (Boston Scientific LithoVue, Dornier Axis, Pusen Uscope; all use CMOS sensors) to a standard digital reusable ureteroscope (Olympus URF-V2; uses CCD sensor).
Methods: We recorded video from several ureteroscopy cases using each ureteroscope. A representative one-minute clip of one case with each scope was created. Blinded urology attendings (n=5) and residents (n=5) rated image resolution, contrast, color, sharpness, glare, depth perception, distortion/artifacts, and overall image quality on a five-point Likert scale using a novel evaluation instrument. Internal consistency was tested and MANOVA was used to compare responses.
Results: Forty surveys were completed. The results demonstrated internal consistency (Cronbach α=0.95). The domain most correlated with overall image quality was image resolution (0.71). Overall image quality, image resolution and contrast were rated higher in the Olympus than the LithoVue while the Uscope was rated lower than other scopes; sharpness was higher in the URF-V2 than other scopes; color, glare, depth perception, and distortion/artifacts were better in the URF-V2 than the Uscope (all p<0.05).
Conclusions: The standard digital reusable scope performed superiorly in nearly every category, suggesting a CCD sensor may provide better image quality and performance for cases where excellent visuals are required. It is notable that the single-use LithoVue and Axis scopes performed quite well in overall image quality. The novel evaluation instrument demonstrated internal consistency, indicating appropriateness for use in future studies.



Poster #50. Fig. 1.

Poster #51

Ureteroscopy with conscious sedation is safe and efficacious: A single-center, prospective study

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Introduction: Ureteroscopy (URS) is a common, minimally invasive, surgical procedure for upper urinary tract conditions. While URS has been typically performed with general or spinal anesthesia, our center has published on the feasibility of using conscious sedation for distal ureteric stones. Given the reduction of operating slates during the COVID-19 pandemic and the advent of smaller, semirigid and flexible ureteroscopes, we sought to study whether URS with conscious sedation is safe and effective.
Methods: From November 2019 to June 2020, we prospectively collected data from patients undergoing URS with local anesthetic and urologist-directed, nursing-administered intravenous sedation. Using SPSS, continuous and categorical variables were analyzed with Student T or Mann-Whitney U tests and Chi-squared or Fisher's exact test, respectively. Multivariate-adjusted logistic regression analysis was performed to assess associations with successful URSs.
Results: All 99 URSs were included: 73 for urolithiasis, 24 for upper tract urothelial carcinoma (UTUC), and two for obstruction. Mean age was 61.2±13.7 years, with 55 males and 44 females. Mean sedation used was 3 mg (IQR 2–4) of midazolam and 100 µg (IQR 100–150) of fentanyl. Median fluoroscopy time was 56.5 seconds (IQR 30.8–96.3). The overall success rate was 83.8% (83/99) (Table 1). URS for urolithiasis was associ-

	Overall n = 99 (100.0%)	Urolithiasis n = 73 (73.7%)	UTUC or obstruction n = 26 (26.3%)	p-value
Age (y)	61.2 ± 13.7	57.6 ± 12.8	71.4 ± 10.8	**< 0.001**
Sex				
Male	55 (55.6%)	36 (49.3%)	19 (73.1%)	
Female	44 (44.4%)	37 (50.7%)	7 (26.9%)	**0.036**
Fluoro time (s)	56.5 [30.8 - 96.3]	56 [31 - 89.8]	62 [25.8 - 111.8]	0.666
Side				
Unilateral	93 (93.9%)	71 (97.3%)	22 (84.6%)	
Bilateral	6 (6.1%)	2 (2.7%)	4 (15.4%)	**0.040**
Transplanted kidney				
Yes	3 (3.0%)	2 (2.7%)	1 (3.8%)	
No	96 (97.0%)	71 (97.3%)	25 (96.2%)	0.999
Location of interest				
Distal ureter	27 (27.3%)	23 (31.5%)	5 (19.2%)	
Mid ureter	6 (6.1%)	4 (5.5%)	2 (7.7%)	
Proximal ureter	22 (22.2%)	18 (24.7%)	5 (19.2%)	
Intra-renal	41 (41.4%)	28 (38.4%)	14 (53.8%)	0.475
Largest stone diameter (mm)*	---	6 [4 - 7]	---	
Number of stones on the side of interest*	---	2 [1 - 3]	---	
Previous ureteric stent				
Yes	23 (23.2%)	18 (24.7%)	5 (19.2%)	
No	76 (76.8%)	55 (75.3%)	21 (80.8%)	0.574
Access sheath used				
Yes	33 (33.3%)	26 (35.6%)	7 (26.9%)	
No	66 (66.7%)	47 (64.4%)	19 (73.1%)	0.419
Laser used				
Yes	43 (43.4%)	38 (52.1%)	5 (19.2%)	
No	56 (56.6%)	35 (47.9%)	21 (80.8%)	**0.004**
Basket used				
Yes	62 (62.6%)	61 (83.6%)	1 (3.8%)	
No	37 (37.4%)	12 (16.4%)	25 (96.2%)	**< 0.001**
Dilation				
Yes	21 (21.2%)	19 (26%)	2 (0.7%)	
No	78 (78.8%)	54 (74%)	24 (92.3%)	**0.050**
Biopsy taken				
Yes	7 (7.1%)	1 (1.4%)	6 (23.1%)	
No	92 (92.9%)	72 (98.6%)	20 (76.9%)	**< 0.001**
Post-URS stent insertion				
Yes	81 (81.8%)	65 (89.0%)	16 (61.5%)	
No	18 (18.2%)	8 (11.0%)	10 (38.5%)	**0.006**
Fentanyl (µg)	100 [100 – 150]	100 [100 – 150]	100 [100 – 100]	0.084
Midazolam (mg)	3 [2 - 4]	3 [3 - 4]	2 [2 - 3.75]	**0.017**
Successful procedure				
Yes	83 (83.8%)	59 (80.8%)	24 (92.3%)	0.225
No	16 (16.2%)	14 (19.2%)	2 (7.7%)	

* Only stone related procedures

Poster #51. Table 1. Comparison of clinical characteristics between patients that underwent URS due to urolithiasis vs. UTUC or obstruction.

	OR	95% CI	p-value
Group			
UTUC or obstruction	1		
Urolithiasis	0.157	0.025 - 0.973	**0.047**
Age (per y)	1.005	0.947 - 1.066	0.880
Sex			
Male	1		
Female	1.048	.276 3.971	0.945
Location of interest			
Distal ureter	1		
Mid and Proximal ureter	0.135	0.013 - 1.381	0.091
Intra-renal	0.138	0.014 - 1.332	0.087
Fluoro time (per s)	0.994	0.987 - 1.002	0.132
Fentanyl (per µg)	0.998	0.981 - 1.016	0.837
Midazolam (per mg)	2.496	1.057 - 5.892	**0.037**

Poster #51. Table 2. Multivariable adjusted analysis showing the association between clinical characteristics and successful outcome after URS.

ated with a lower success rate than those for UTUC or obstruction (OR 0.157, 95% CI 0.025–0.973, p=0.047). Increased use of midazolam was associated with a higher success rate (OR 2.496, 95% CI 1.057–5.892, p=0.037) (Table 2).

Conclusions: This is the first study to demonstrate the safety and efficacy of URS with conscious sedation. Our findings must be understood within the limitations of a single-center analysis. We plan to prospectively collect patient-reported outcomes to assess patient tolerability of URS with conscious sedation.

Poster #52

Development of a new Canadian endourology group stent symptom score (CEGSSS)

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Introduction: Placement of a ureteral stent is a common urological intervention, and it is known that stents can significantly impact quality of life for some patients. The ureteral stent symptom questionnaire (USSQ) has been used since its development in 2003 but its length hinders its use in clinical practice. Therefore, we sought to develop a new, shorter, practical and validated tool.

Methods: We sought to create a new quality of life questionnaire using a two-phase schema: phase 1: using the USSQ as a starting point, nine Canadian Endourology Group (CEG) members and 21 patients evaluated each item of the USSQ (Likert scale 1–5) to determine its importance/relevance in assessing symptoms associated with a ureteral stent. All accepted items were then discussed with face-to-face meetings. Phase 2 (pilot trial): Patients undergoing stent placement completed the newly developed CEGSSS in addition to a short survey evaluating the tool itself. Five rounds of five patients, with modifications of the CEGSSS based on feedback after every round was anticipated.

Results: Phase 1: After consultation with patients and CEG experts, items were accepted if the mean patient or expert rating was ≥4.0 (out of 5) with a SD of ≤0.75. Questions with mean patient or mean expert ratings of ≥4.0 but SD ≥0.75 were flagged for discussion. Those items that did not meet these requirements were rejected. In addition, those items with divergent results between experts and patients were also discussed to ensure that the final version of the CEGSSS was representative of the objective. The final CEGSSS contains 15 questions divided into three domains: urination (eight questions), pain (three questions), and quality of life (two questions).

Phase 2: 16 patients were recruited. After three rounds of patient feedback, no new feedback was received and therefore this process was deemed complete. Median time to complete the questionnaire was seven minutes (2–20 minutes). Two of 16 patients required assistance to complete the questionnaire, but all patients rated it as easy to navigate. Mean level of difficulty was 1.75 (out of 5).

Conclusions: Through a process of expert and patient consultation and a pilot trial with patients receiving a ureteral stent, a new stent symptom questionnaire was developed that is both short, easy for patients to understand and clinically relevant. The next step will be external validation of the newly developed CEGSSS.

Poster #53

The Endourologic Disease Group for Excellence (EDGE) prospective, randomized trial of two weeks vs. three months of antibiotics after percutaneous nephrolithotomy for infection-related kidney stones

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Introduction: Struvite infection kidney stones are associated with bacterial infection. Although accounting for only 15% of all stones, they cause disproportionate mortality (up to 67%). Treatment of struvite stones involve complete surgical stone removal followed by antibiotic therapy to eliminate the bacterial infection to reduce stone recurrence. Currently, the optimal duration of antibiotic therapy to prevent stone recurrence is unknown. We sought to determine if there is a difference in outcome between two weeks or three months of antibiotics post-percutaneous nephrolithotomy (PCNL).

Methods: This was a multicenter, prospective, randomized trial evaluating patients with struvite stones undergoing PCNL. Inclusion criteria additionally included stone free status after surgery, defined as having no residual fragments on CT 2 mm or larger. Patients were randomized to two weeks or three months of postoperative oral antibiotics (nitrofurantoin or culture specific antibiotic). Surveillance imaging and urine culture was performed at three, six, and 12 months post-PCNL to determine the recurrence of stones and urine colonization or infection. The study was powered to 80% with 18 patients in each group.

Results: A total of 38 patients (51.7±17.7 y) were enrolled and randomized to either two weeks (n=20) or three months (n=18) of antibiotic therapy post-PCNL. BMI was similar between groups (31.9±9.7 vs. 31.7±11.8 kg/m^2) as was stone surface area (426±194 vs. 683±856 mm^2, p=0.32), respectively. At three-, six-, and 12-month followup, positive urine cultures were 40% vs. 33.3%, 30% vs. 50%, and 30% vs. 38.9% between two-week and three-month groups, respectively (p=ns). At three, six, and 12 month followup, stone-free rates were 62.5% vs. 61.5%, 61.5% vs. 55.6%, 66.7% vs. 50% (p=ns) between two-week and three-month groups, respectively. No patients in either cohort were admitted to hospital for sepsis or febrile episodes.

Conclusions: There is no difference in stone recurrence, re-infection, or recurrent urinary tract infections comparing two weeks vs. three months of postoperative antibiotics among patients with struvite kidney stones undergoing PCNL. For patients with complete clearance of struvite stones following PCNL, two weeks of postoperative oral antibiotics is sufficient to prevent recurrent infections and stones. This patient population is at high risk of recurrence for both infections and stones.

Poster #54

Comparison of laser operator duty cycles during high power Holmium:YAG and thulium fiber laser lithotripsy in patients with upper tract stone disease

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Introduction: Operator duty cycles (ODC) is a measure to compare efficiency of laser activation during ureteroscopy. Laser ODC is defined as overall time the laser pedal is depressed (LOT) divided by lithotripsy time (LT; first to last pedal activation including pauses). ODC for Ho:YAG lithotripsy ranges from 32–63%. In vitro studies with thulium fiber laser (TFL) lithotripsy suggest decreased retropulsion and improved visualization compared to Ho:YAG lithotripsy. These factors may directly impact LOT and pauses thus improving ODC. The objective of this study is to quantify differences in retropulsion, visualization, and efficiency between Ho:YAG (100 W Empower, Olympus) and TFL (Soltive PLS, Olympus) during ureteroscopic lithotripsy procedures.

Methods: This prospective study (n=62; 31 in each cohort) examined patients with 10–30 mm renal calculi who underwent ureteroscopy with fixed dusting settings (0.4J X 60Hz) for both lasers by three-endourology faculty. LOT and lithotripsy times were collected from laser logs of each case. LOT was verified by the formula (LOT= total energy delivered [J])/(energy [J] x frequency [Hz]) for any discrepancy. Retropulsion, visibility, and bleeding during lithotripsy were graded for all cases by the three urologists using 5-point Likert scales. ODC was calculated using the formula (LOT/LT). Correlation coefficients were calculated to define relationships between stone and lithotripsy characteristics.

Results: Mean age, BMI, stone number, density, ellipsoid volume, and STONE score were not significantly different between the groups. TFL was scored more favorably in retropulsion (1.6 vs. 2.8), visibility (1.8 vs. 3.3), and bleeding (1.1 vs. 1.9). TFL lithotripsy also had significantly shorter LOTs (380.6 vs. 533.6 seconds, p=0.015) and superior ODC efficiency (49.1% vs. 34.2%, p=0.0001) (Table 1). An inverse correlation was found between ODC and stone density, volume and STONE score, as well as retropulsion, visualization and bleeding grading.

Conclusions: These findings suggest that TFL may be more efficient than Ho:YAG in the treatment of medium to large stones when operated in dusting mode. The longer pedal activation times during TFL especially at higher settings may necessitate future studies on their thermal implications.

Mode	Ho:YAG	TFL	P value (<0.05 significant)
N	31	31	
Age , Years , mean/SD	54.85 (12.09)	56.13 (13.32)	0.70
BMI, mean/SD	34.28 (13.44)	32.05 (7.29)	0.41
Stone number	1.79 (1.27)	2.29(2.4)	0.30
Stone density, HU, mean/SD	803.25(302.6)	845.62 (371.02)	0.62
Stone volume (ellipsoid formula), mm3, mean/SD	1088.9(1612.9)	1150.8(2254.8)	0.90
Stone Score, mean/SD	10.42 (1.68)	10.48 (1.82)	0.89
Retropulsion (1 minimal – 5 interfering with procedure)	2.8	1.6	0.004*
Visibility (1 minimal – 5 interfering with procedure)	3.3	1.8	0.0009*
Bleeding (1 minimal – 5 interfering with procedure)	1.9	1.1	0.03*
Total energy for stone ablation kJ, median (IQR)	8156.7 (3260-10157.8)	11719.2 (2887.3-18558.3)	0.05*
Laser-on time, seconds, median (IQR)	533.6 (115.6-618.6)	380.6 (340-698.5)	0.015*
Operator duty cycles (IQR)	34.2 (24.4-42.4)	49.1 (39.2-58.4)	0.0001*
Correlation of OCD with stone characteristics Stone density Stone Volume Stone SCORE		-0.42 -0.28 -0.33	0.0006* 0.02* 0.0009*
Correlation of OCD with Lithotripsy characteristics Retropulsion Visibility Bleeding		-0.17 -0.29 -0.36	0.05* 0.02* 0.004*

Poster #54. Table 1.

Poster #55

Using a Delphi process to establish consensus for the deign and development of a simulation model for holmium laser enucleation of the prostate

Christopher Wanderling[1], Rachel Melnyk[1], Scott Quarrier[1], Mitchell Humphreys[2], Gopal Narang[2], Amy Krambeck[3], Nicole Miller[4], Rajat Jain[1], Ahmed Ghazi[1]
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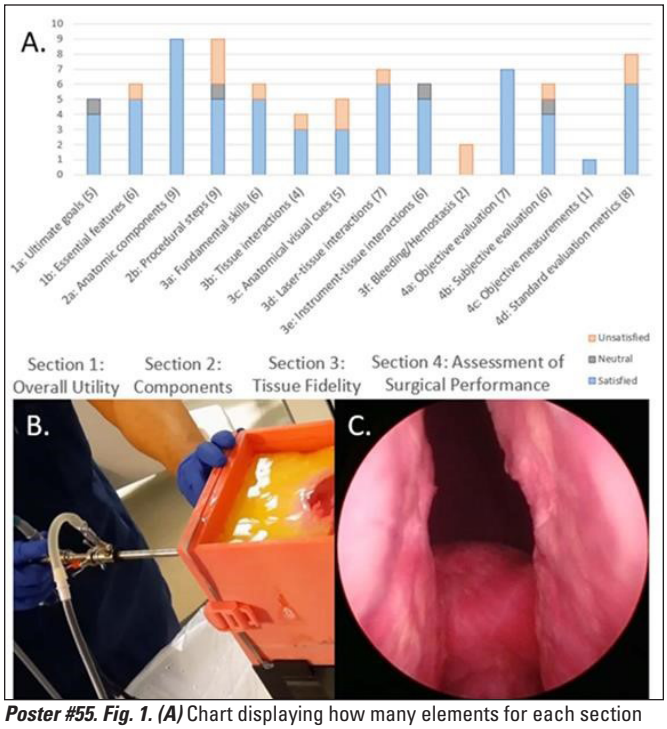
Introduction: Holmium laser enucleation of the prostate (HoLEP) is a minimally invasive approach for the management of benign prostatic hyperplasia (BPH). The steep learning curve and deficiency of realistic simulation platforms with incorporated objective metrics has hindered the adoption of this technique and may be why it is still underutilized. The aim is to design and fabricate a high-fidelity, non-biohazardous hydrogel platform to specifications attained from expert consensus.

Methods: An expert panel of endourologists provided consensus through Delphi methodology. Overall, 250 questions evaluated aspects to optimize a HoLEP simulation, including: overall utility, anatomical and procedural components, tissue fidelity, assessment of performance. Consensus (>80% agreement) over three rounds defined 81 essential elements that were incorporated into an approved virtual design. Three model prototypes were fabricated using a combination of hydrogel molding and 3D printing. A complete HoLEP procedure on the final prototype was recorded in an operating room setting. Experts reviewed the video recording to confirm fulfillment of the consensus elements as a first step for validation.

Results: The model fulfilled 78% (63/81) and lacked 17% (14/81) elements. Categorically, 82%, 78%, 73%, and 82% were satisfied in overall utility, anatomical and procedural components, tissue fidelity, and assessment of performance, respectively (Fig. 1). The model contained all nine anatomic components (e.g., bladder, ureteric orifices, lateral and median lobes, capsule, urethra), seven objective evaluation metrics (e.g., injury



Poster #55. Fig. 1. (A) Chart displaying how many elements for each section were satisfied. ***(B)*** Surgeon operating on a model. ***(C)*** Endoscopic view showing lateral an median lobes.

of ureteric orifices or bladder neck, perforation of the bladder or prostate capsule), and five procedural steps except for hemostasis and morcellation. Laser and instrument tissue interactions achieved >85% satisfaction. All experts agreed the model may deliver a safe training alternative, be used to evaluate trainee performance, and trial new approaches in a risk-free environment.
Conclusions: This is the first expert consensus-based approach to design and fabricate a hydrogel HoLEP simulation with incorporated objective evaluation metrics capable of supplementing HoLEP training. Final modifications will mainly include the addition of morcellation and bleeding to prepare for the validation phase.

Poster #56

Efficiency, efficacy, and cost-effectiveness: Holmium:YAG vs. thulium fiber laser for treatment of upper urinary tract calculi in dusting mode

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Introduction: When comparing thulium fiber laser (TFL) to Holmium:YAG (Ho:YAG), preliminary studies examining dusting of renal calculi have demonstrated superiority of the TFL. These studies are mainly based on laboratory studies with emerging clinical reports limited to optimizing TFL dusting settings. The objective of this study is to compare the efficiency, effectiveness, and cost effectiveness of high power Ho:YAG (100 W Empower, Olympus) to TFL (Soltive PLS, Olympus) lasers operated with a fixed dusting protocol.
Methods: A prospective study examining 62 patients (31 per group) with 10–30 mm renal calculi was completed. Retrograde intrarenal surgery (RIRS) lithotripsy was used for both lasers with fixed dusting settings (0.4J X 60Hz). Laser on time (LOT), Ablation efficacy (J/mm3) and Ablation speed (mm^3/second) were evaluated. Retropulsion, visibility, and bleeding during RIRS were graded by three endourologists (five-point Likert scales). Stone-free rate (SFR) was assessed at one month with non-contrast CT. Projected cost savings were calculated utilizing the formula: [average LOT difference **x** $100/minute billed to insurance for RIRS **minus** $178 (differential between list price of the 200m TFL ball tip and regular Ho:YAG fiber) **plus** price differential for upgrade to PLS Soltive ($18800/1000) amortized over 1000 procedures=$18.8].
Results: Mean age, BMI, stone number, density, ellipsoid volume and STONE score was not significantly different between groups. TFL lithotripsy had significantly shorter LOTs (380.6 vs. 533.6 seconds, p=0.015) and higher SFRs (68% vs. 34.8%, p=0.03). Both ablation efficacy (21.2 vs. 12.5 J/mm^3, p=0.02) and speed (4.1 vs. 1.2 mm^3/second, p=0.003) were significantly higher with TFL. TFL was 2.6 min faster for all stones (3.4 min for stones <15 mm vs. 1.7 min for stones >15 mm) with an overall projected $69.2 saving per case [$266- ($178+ $18.8)] (Table 1). TFL was superior in terms of retropulsion (1.6 vs. 2.8), visibility (1.8 vs. 3.3), and bleeding (1.1 vs. 1.9) grading.
Conclusions: This clinical study demonstrates TFL as a more effective, efficient, and cost effective option during RIRS laser lithotripsy when operated in dusting mode. TFL produces higher stone ablation rates and speed with improved stone free rates compared to the Ho:YAG laser.

Mode	Ho:YAG	TFL	P value (<0.05 significant)
N	31	31	
Age , Years , mean/SD	54.85 (12.09)	56.13 (13.32)	0.70
BMI, mean/SD	34.28 (13.44)	32.05 (7.29)	0.41
Stone number	1.79 (1.27)	2.29(2.4)	0.30
Stone density, HU, mean/SD	803.25(302.6)	845.62 (371.02)	0.62
Stone volume (ellipsoid formula), mm3, mean/SD	1088.9(1612.9)	1150.8(2254.8)	0.90
Stone Score, mean/SD	10.42 (1.68)	10.48 (1.82)	0.89
Retropulsion (1 minimal – 5 interfering with procedure)	2.8	1.6	0.004*
Visibility (1 minimal – 5 interfering with procedure)	3.3	1.8	0.0009*
Bleeding (1 minimal – 5 interfering with procedure)	1.9	1.1	0.03*
Total energy for stone ablation kJ, median (IQR)	8156.7 (3260-10157.8)	11719.2 (2887.3-18558.3)	0.05*
Laser-on time, seconds, median (IQR)	533.6 (115.6-618.6)	380.6 (340-698.5)	0.015*
Ablation efficiency, J/mm3, median (IQR)	12.5 (5.8-16.6)	21.2 (5.8-28.3)	0.02*
Ablation speed, mm3/second, median (IQR)	1.19 (0.4-1.4)	4.1 (1.1-4)	0.003*
Stone free rates , % (% with postop imaging)	34.8% (76.7%)	68% (83.3%)	0.03*
Projected cost savings ($) • All stones • Stones < 15mm • Stones > 15 mm		$69.2 $143.2 -$26.8 (loss)	

Poster #56. Table 1.

Poster #57

Metabolic disturbances during topiramate use and their reversibility following drug cessation

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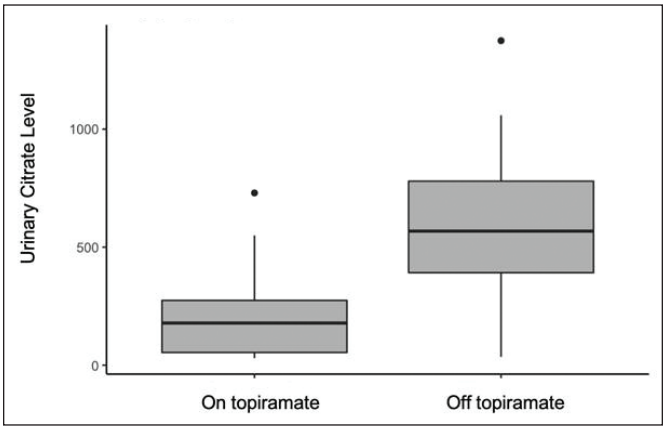
Introduction: Topiramate is a commonly used medication that inhibits carbonic anhydrase, causing renal tubular acidosis and hypocitraturia, thereby increasing the risk for kidney stone formation. Despite the strong association between topiramate use and kidney stone formation, few studies have examined the characteristics of stone formers taking topiramate. Additionally, the reversibility of the metabolic disturbances with cessation of the medication has not been previously studied. To fill this knowledge gap, we investigated the stone composition and 24-hour urine samples of a large cohort of stone formers taking topiramate.
Methods: All progress notes written by five endourologists from a single academic center were retrospectively reviewed from January 2010 to July 2020 containing the words "topiramate" or "topamax." Inclusion criteria were age > 18 and presence of either a 24-hour urine sample or stone analysis while on topiramate. In addition, a subgroup of 17 patients with 24-hour urine samples before and after stopping topiramate were identified.
Results: A total of 93 patients were identified and included for final analysis. Twenty-four hour urine samples were available in 65 patients and showed mean citrate excretion of 333 mg/day (95% confidence interval [CI] 254–412), mean pH of 6.54 (95% CI 6.41–6.68), and mean calcium phosphate supersaturation of 1.8 (95% CI 1.6–2.1). In the subgroup analysis, mean urinary citrate excretion increased from 233 mg/day (95% CI 135–330) to 633 mg/day (95% CI 471–796, p<0.01), and pH decreased from 6.61 (95% CI 6.34–6.89) to 6.34 (95% CI 6.12–6.56, p=0.06) after stopping topiramate (Fig. 1). A total of 114 stone events occurred in 73 distinct patients with 50% either pure or majority (>50%) calcium phosphate by composition.
Conclusions: Hypocitraturia and elevated pH is seen during topiramate use with resultant higher rate of calcium phosphate stone formation compared to the general population. Stopping topiramate leads to significant increase in citrate excretion and normalization of pH. Patients and providers should be aware of this risk when starting topiramate therapy. These metabolic disturbances appear to be reversible with medication cessation.



Poster #57. Fig. 1. Urinary citrate levels before and after stopping topiramate.

Poster #58

Resolution of hydronephrosis and pain to predict stone passage for patients with acute renal colic

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Introduction: To study patients presenting to the emergency department with acute renal colic to determine if resolution of hydronephrosis and pain accurately predicts stone passage on followup CT.

Methods: This is a secondary analysis of a multi-center prospective randomized clinical trial of patients diagnosed by computed tomography (CT) scan with a symptomatic ureteral stone <9 mm in diameter. Participants were followed to evaluate for analgesic use and to assess stone passage and hydronephrosis on a repeat CT scan obtained at 29–36 days.

Results: Four hundred-three patients were randomized in the original study and patients were included in this analysis if they did not have surgery for stone removal and had a CT scan and information on pain medication at followup (n=220). Hydronephrosis was detected in 181 (82%) on initial CT. At followup CT, 43 (19.5%) participants had a persistent ureteral stone. Of these participants, 36 (84%) had no pain, 26 (60%) did not have hydronephrosis, and 23 (53%) had neither pain nor hydronephrosis. Resolution of hydronephrosis was associated with stone passage (RR 4.6, 95% CI 1.9, 11.0), while resolution of pain was not (RR 1.1, 95% CI 0.9, 1.4).

Conclusions: In patients with urinary stone disease, stone passage is associated with resolution of hydronephrosis but not resolution of pain. In patients with persistent ureteral stones, neither pain nor hydronephrosis are consistently present. These findings have important implications on followup imaging of patients with urinary stone disease.

Funding: This study is supported by cooperative agreement U01 DK096037 from the National Institute of Diabetes and Digestive and Kidney Disease, National Institutes of Health.

Poster #59

The effects of delayed definitive stone surgery on imaging among stone patients with a stent placement

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Introduction: Longer indwelling stent duration prior to definitive stone surgery may be associated with increased healthcare utilization. The objective of this study was to assess the effects of ureteral stent duration prior to definitive stone surgery on imaging pre and post stone surgery.

Methods: Two retrospective analyses were conducted using IBM MarketScan commercial data from July 2014 to September 2018. Patients were included in cohort 1 and cohort 2, if they underwent ureteroscopy (URS) and shockwave lithotripsy (SWL), respectively, within six-months of stent placement. The time between ureteral stent placement and definitive stone surgery was calculated and categorized into two groups: ≤15 days and >15 days. Healthcare utilization included imaging (CT, ultrasound, x-ray) and was measured post stent-placement till three-months post-stone surgery. To evaluate the association between delayed stone treatment and imaging, a logistic regression model was conducted, controlling for patient comorbidities and demographics. The analyses were conducted using Instant Health Data.

Results: Cohort 1 comprised of 6302 patients. Of these, 42.32% of patients underwent URS after 15 days of stent placement while 57.68% underwent URS within 15 days of stent placement. Patients who underwent definitive ureteroscopy for stone treatment more than 15 days after ureteral stent placement were significantly associated with increased imaging utilization (OR 1.43, p<0.0001). Cohort 2 included 3570 patients. Of these, 33.5% of patients underwent SWL more than 15 days after ureteral stent placement while 66.5% underwent SWL within 15 days of stent placement. Patients who underwent SWL more than 15 days of stent placement were significantly associated with increased imaging utilization (OR 1.87, p<0.0001).

Conclusions: Patients who underwent definitive stone surgery 15 days after ureteral stent placement were associated with increased imaging utilization, which might potentially lead to increased medical costs.

Funding: Boston Scientific.

	All N=220	Passed Stone N=177	Persistent Stone N=43
No hydronephrosis or pain	179	156 (88%)	23 (53%)
No hydronephrosis, but pain	20	17 (10%)	3 (7%)
No pain, but hydronephrosis	15	2 (1%)	13 (30%)
Both hydronephrosis and pain	6	2 (1%)	4 (9%)

Poster #58. Table 1. Hydronephrosis and pain status at followup.

Poster #60

Outcomes of direct visual internal urethrotomy with mitomycin-C (DVIU-MMC) in bladder neck contracture (BNC) and vesicourethral anastomosis stricture (VUAS) following prostate cancer treatment

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Introduction: BNC and VUAS secondary to radical prostatectomy (RP) and/or radiation represent significant challenges to patient care. Definitive management would likely require complex urethroplasty that may also result in urinary incontinence. The purpose of this study is to evaluate the efficacy of DVIU-MMC in these populations.

Methods: This is a retrospective chart review of patients at a single tertiary care center who underwent DVIU-MMC for recurrent BNC/VUAS between 2015 and 2020. Patients with complete urethral obliteration, prior bladder neck reconstruction, or <3 months of followup were excluded. Patients were sorted into three groups: RP and radiation, radiation alone, or RP alone.

Results: Thirty-eight patients were included in the study with a median followup of 40.1 months. Seventy-four percent had prior dilation, 50% had prior DVIU, and 29% had prior indwelling catheter or performed intermittent catheterization. Success was achieved in 39% overall after one procedure, an additional 16% after two procedures, and another 13% after three procedures. Overall combined success rate after four procedures was 74%. There were no significant differences in recurrence within four procedures between patients with RP and radiation, radiation alone, or RP alone (65%, 73%, and 90%, respectively, p=0.362). Seven patients required more than four procedures. Three patients required suprapubic tube placement for refractory disease, all of whom had undergone both RP and radiation. The average interval to first recurrence was significantly shorter in patients who had undergone RP and radiation (average months: RP and radiation 3.7, radiation 22.8, RP 15.7; p=0.002).

	Group	All	RRP + Radiation	Radiation	RRP	p
	n =	38	17	11	10	
Initial DVIU MMC	Success	15 (39%)	6 (35%)	5 (45%)	4 (40%)	0.868
Second Procedure	Recurrence Interval (months)	11.8	3.7	22.8	15.7	*0.002
	Cumulative Success	21 (55%)	7 (41%)	8 (73%)	6 (60%)	0.254
Third Procedure	Recurrence Interval (months)	5.6	7.3	3.1	4.2	--
	Cumulative Success	26 (68%)	10 (59%)	8 (73%)	8 (80%)	0.496
Fourth Procedure	Recurrence Interval (months)	8.3	9.9	8.1	3.5	--
	Cumulative Success	28 (74%)	11 (65%)	8 (73%)	9 (90%)	0.362
>4 Procedures		8	4	3	1	--

Poster #60. Table 1.

Conclusions: Endoscopic management in this patient population appears to require at least three procedures for reasonable success rates. Although success rates do not differ significantly between groups, our data suggests that patients who have undergone both RP and radiation experience poorer outcomes given that time to recurrence was more rapid and all patients requiring SP placement were in this group. Previous studies have not differentiated between patients receiving RP and radiation, radiation alone, or RP alone, which may have important clinical implications.

Poster #61

Accuracy of ureteral stone measurements in radiology reports: A single-institution study of 100 patients

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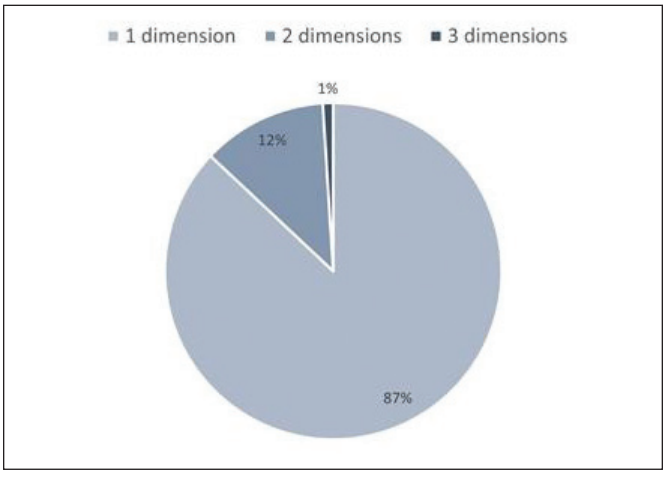
Introduction: Radiology reports of CT scans are used to guide medical and surgical management of nephrolithiasis, especially in patients presenting to the emergency department (ED). However, many reports only provide one- or two-dimensional stone sizes, which may inadequately describe stone size. We aimed to evaluate the number of dimensions described in the radiologist's CT read and determine whether the maximum stone dimension was reported accurately.

Methods: We conducted a single-center, retrospective study of 100 patients who presented to the ED with unilateral, solitary, obstructing stones between March 2018 and March 2021. CT imaging and reports were reviewed. Our primary observation was whether the maximal stone dimension was reported by the radiologist. Secondary outcomes were repeat ED visits and need for urological intervention.

Results: The average age of our cohort was 53.3 years. Sixty-two of the patients were male. Of the 100 reviewed radiology reads, 87% described the stone in one-dimension, 12% in two-dimensions, and 1% in three-dimensions. The dimension of maximal size was not reported in 44% of patients. For these patients, the true maximal dimension differed from reported maximal dimension by an average of 2.0±1.1 mm. Most stones were longest in the craniocaudal plane (56%), although only 21% of reports provided a craniocaudal measurement.

Conclusions: We show that in a cohort of patients presenting to the ED for obstructing ureterolithiasis, stone size is frequently underestimated when measured in only one- or two-dimensions. In many cases, this is due to absence of a reported craniocaudal measurement. Inadequate characterization of stone size may affect management decisions and patient outcomes.



Poster #61. Fig. 1. Number of dimensions reported in CT reads for obstructing stones.

Poster #62

Evaluating the acceptability of an online patient decision-aid for the surgical management of lower urinary tract symptoms secondary to benign prostatic hyperplasia

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Introduction: With the help of a steering committee that included patient advocates, and both methodological and clinical experts, an online patient decision aid (PtDA) that includes all BPH guideline-approved surgical modalities was developed. The goal of this study is to assess the acceptability of the PtDA within former BPH surgery patients and urologists that treat BPH surgically.

Methods: The Ottawa Decision Support Framework was used to develop a PtDA that addresses monopolar transurethral resection of the prostate (TURP), bipolar TURP, GreenLight photovaporization, enucleation, Rezum, Urolift, Aquablation, open retropubic prostatectomy, and robotic retropubic prostatectomy. The PtDA was divided into three sections according to the following prostate volumes: small to moderate (30–80 mL), moderate to large (80–150 mL), and large (>150 mL). Eleven urologists that regularly treat BPH and 15 former BPH surgery patients were recruited. Alpha-testing with a survey using a validated acceptability scoring system was undertaken.

Results: For all sections of the PtDA, the urologists and patients agreed that the language used was easy to follow, that the amount of information provided was about right, that the length of the PtDA was appropriate, and that the outcomes reported were correct and clearly explained. All 11 urologist participants (100%) found that the description of the treatments within the moderate to large prostate section of the PtDA was well balanced. For both the small to moderate, and large prostate sections, 91% (10/11) of participants found treatment descriptions were well balanced. All participants within the large prostate volume subgroup found that the description of the treatments within this section was well balanced (3/3). Regarding the small to moderate, and moderate to large prostate sections, 36% (4/11) and 0% (0/1) of participants found treatment descriptions were well-balanced, respectively.

Conclusions: Our PtDA was found to be acceptable among urologists and patients. These results demonstrate that most of the participants were satisfied with the quality of this PtDA and either recommend the use of this tool or plan to incorporate it in their clinical practice.

Poster #63

Opioid analgesic use is associated with unplanned clinical encounters for ureteral stent related symptoms

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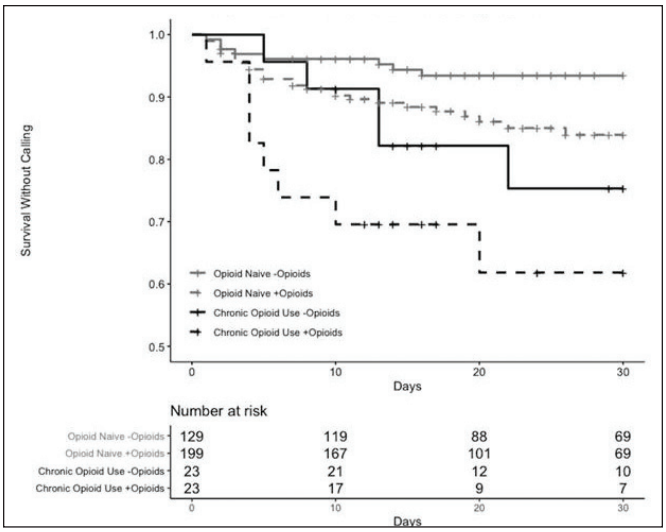
Introduction: Patients with double-J ureteral stents (US) often suffer from urinary urgency, frequency, hematuria, and flank pain, termed ureteral stent-related symptoms (USRS). USRS impair patient well-being and prompt unplanned clinical encounters which burden the healthcare system. An increasing body of urological literature suggests limiting the use of opioid medications after endoscopic procedures, therefore we hypothesized that these medications are ineffective at reducing USRS among patients who underwent US placement as the only procedure.



Poster #63. Fig. 1. Time to clinic call for ureteral stent-related symptoms.

Methods: A retrospective study of patients identified by CPT code for their first US placement from 2014–2019 at a single institution was conducted. Patient demographics, discharge medications, and presenting clinical factors were evaluated using multiple logistic regression with respect to postoperative telephone and emergency room (ER) encounters for USRS within 30 days. Multivariate, univariate, and survival analyses were performed.
Results: Of 374 patients, 75 (20.1%) had ≥1 encounter for USRS: 48 (12.8%) called the clinic and 39 (10.4%) returned to the ER. Chronic opioid use (COU) was predictive of calls and ER visits (OR 3.21, CI 1.42–6.97, p<0.01; and OR 3.64, CI 1.45–8.98, p<0.01). Opioid-naive patients given opioids at discharge presented sooner and more often (calls p=0.025, ER p=0.041). Among those with COU, a similar effect was observed for ER visits only (p=0.002). No postoperative medications (including alpha blockers and anticholinergics) were associated with reduced unplanned patient contact.
Conclusions: A counterintuitive relationship between opioids and unplanned contact was observed. Patients with a history of COU may have worse USRS or a lower threshold to seek care than opioid naïve patients and tend to bypass clinic for the ER. As no studied medications reduced unplanned contact, urologists should consider upfront definitive management of ureteral obstruction when appropriate.

Poster #64

Antibiotic prophylaxis for prevention of infectious complications after shockwave lithotripsy: A systematic review and meta-analysis

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Introduction: The use of antibiotics before shockwave lithotripsy (SWL) varies greatly globally. Guidelines have been hampered by reliance on limited evidence summaries and data for this issue. To address this gap, we performed a systematic review and meta-analysis of trials investigating the effects of antibiotic prophylaxis on infectious outcomes after SWL.
Methods: A systemic search was conducted in the Cochrane central register of controlled trials, Medline, EMBASE, CINAHEL, Web of Science, and PubMed to December 2019. Studies were screened independently and in duplicates for randomized and quasi-randomized controlled trials investigating the effects of antibiotic prophylaxis for prevention of infectious outcomes after SWL for renal or ureteral stones. The Cochrane Risk of Bias 2.0 was used for the assessment of the risk of bias. We used the GRADE methodology to evaluate the certainty of evidence. (PROSPERO CRD42020196574)
Results: We included 17 trials (five quasi-randomized, six placebo-controlled) with approximately 3000 patients. Only four studies recruited participants after 2000. Meta-analysis was only feasible for urine culture, fever, and urinary tract infection (UTI) since reporting for other outcomes such as sepsis or major complication was limited. All of the included studies were at a high risk of bias. UTI was found not to be decreased statistically compared to placebo, however, the certainty in this effect estimate is very low. Also, a reduction in positive urine cultures was detected compared to no prophylaxis, although fever was not significantly reduced (Table 1).
Conclusions: Low-quality clinical trials suggest a limited reduction in infectious outcomes with the use of antibiotic prophylaxis for SWL. A well-conducted, randomized trial is warranted (APPEAL NCT03692715).

Antibiotic prophylaxis compared to no prophylaxis for patients undergoing shockwave lithotripsy for renal or ureteral stones

Patient or population: patients undergoing shockwave lithotripsy for renal or ureteral stones
Intervention: antibiotic prophylaxis
Comparison: no prophylaxis

Outcomes	Anticipated absolute effects* (95% CI) Risk with no prophylaxis	Risk with antibiotic prophylaxis	Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
Positive Urine Culture follow up: median 7 days	110 per 1,000	52 per 1,000 (27 to 98)	OR 0.44 (0.22 to 0.88)	1336 (9 RCTs)	⊕⊕◯◯ LOW a,b	The evidence suggests antibiotic prophylaxis results in a reduction in positive Urine Culture. The evidence suggests that the administration of prophylactic antibiotics vs. no prophylaxis in patients undergoing shockwave lithotripsy results in 58 fewer positive urine cultures in every 1000 patients (95% CI: from 83 fewer to 12 fewer).
Fever follow up: median 7 days	136 per 1,000	69 per 1,000 (28 to 164)	OR 0.47 (0.18 to 1.24)	840 (6 RCTs)	⊕⊕◯◯ LOW a,c	Antibiotic prophylaxis may result in a reduction in fever. The evidence suggests that, in every 1000 patients undergoing shockwave lithotripsy, antibiotic prophylaxis can result in 67 fewer post-procedure fevers (95% CI: from 108 fewer to 28 more).

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).
CI: Confidence interval; OR: Odds ratio

GRADE Working Group grades of evidence
High certainty: We are very confident that the true effect lies close to that of the estimate of the effect
Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

Explanations
a. All the included studies are at a high risk of bias. Especially, studies are suffering the risk of bias in the randomization process which is considered a highly important domain. Therefore, we decided to rate down the certainty in the evidence for risk of bias by one level.
b. Although the visual investigation of the Forest plot is borderline regarding inconsistency, the I square of 40% and marginally significant Chi-Square test of heterogeneity (p=0.09) compelled us to rate down the certainty in evidence for inconsistency by one level.
c. The number of events observed across all the included studies is less than 100. Furthermore, the confidence intervals of effect size include both significant benefit and harm (108 fewer to 28 more events).

Poster #64. Table 1. Summary of findings for antibiotic prophylaxis vs. no prophylaxis.

Poster #66

The impact of surgery and stone passage on kidney stone patient quality of life

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Introduction: With a five-year stone recurrence rate of 30–50%, kidney stone formers are subject to significant morbidity, which negatively impacts their health-related quality of life (HRQOL). Spontaneous stone passage is associated with frequent emergency room visits, significant pain, and discomfort in performing daily activities. We sought to determine the impact of stone surgery and stone passage on patients' individual HRQOL by querying the validated and prospectively collected Wisconsin Stone Quality of Life (WISQOL) database.

Methods: Cross-sectional data was obtained from a total of 3207 kidney stone formers from 14 institutions in North America who completed the WISQOL questionnaire from 2014–2019. The 28 question survey has a 1–5-point scale for each item (total score range 0–140) and is divided into four domains: D1 social functioning, D2 emotional functioning, D3 stone-related impact, and D4 vitality. Univariable and multivariable linear regression models were used to assess the impact of time since most recent surgery and time since most recent stone passage on HRQOL.

Results: Of the 1376 kidney stone formers who had surgery from 2010–2019, time since most recent surgery was an independent predictor of better WISQOL scores in univariable and multivariable analysis (β=2.55 points/year, CI 1.67–3.42, p<0.001; and β=2.26 points/year, CI 1.44–3.08, p<0.001). Of the 1027 kidney stone formers with stone passage from 2010–2019, time since most recent stone passage was an independent predictor of better WISQOL scores in univariable and multivariable analysis (β=2.51 points/year, CI 1.47–3.55, p<0.001; and β=1.59 points/year, CI 0.59–2.59, p<0.05). We performed a subgroup analysis with 626 kidney stone formers with surgery and stone passage between 2010 and 2019. Time since most recent event (surgery or stone passage) was an independent predictor of better WISQOL scores in univariable and multivariable analysis (β=5.58 points/year, CI 3.74–7.43, p<0.001; and β=3.75 points/year, CI 1.97–5.53, p<0.001).

Conclusions: Our study demonstrates that increased time from most recent surgery and increased time from most recent stone passage were independent predictors associated with better HRQOL in kidney stone formers. Further studies should focus on optimizing stone-related modifiable risk factors to decrease the amount of recurrent stone episodes.

Poster #67

Safety and efficacy of TURP vs. laser prostatectomy for the treatment of benign prostatic hyperplasia in multimorbid and elderly individuals aged ≥75

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Introduction: Clinicians often hesitate to perform transurethral resection of the prostate (TURP) in the multimorbid and elderly population, as they may be more prone to perioperative complications. Laser prostatectomy (LP) has emerged as an alternative treatment option for this population. Using real-world data, we aim to compare the outcomes of TURP vs. LP to evaluate the safety and efficacy of LP among multimorbid patients and patients aged ≥75.

Methods: Using real-world data, we selected cohorts of : 1) multimorbid (Charlson comorbidity index ≥3); and 2) elderly (aged ≥75) patients with benign prostatic hyperplasia who underwent laser coagulation, vaporization or prostate enucleation, or TURP between January 2005 and December 2016 in New York and California. We assessed the incidence of 30-day and 90-day re-admission to the hospital or emergency room (ER) and 90-day complications as short-term outcomes. The long-term outcomes were reoperation and the development of urethral stricture.

Results: We found 12 815 and 29 806 patients in the multimorbid and elderly cohort, respectively. Compared to LP, TURP was associated with lower odds of 90-day hospital readmission and ER visit in the multimorbid cohort (OR 0.92, 95% CI 0.85–1.00), while it was associated with higher odds in the elderly cohort (OR 1.07, 95% CI 1.01–1.14). The multimorbid cohort showed lower odds of urinary tract infections (OR 0.85, 95% CI 0.75–0.96) but higher odds of hematuria (OR 1.44, 95% CI 1.03–2.02) post-TURP vs. LP. The elderly cohort showed higher odds of experiencing urinary retention and hematuria (OR 1.24, 95% CI 1.03–1.50 and OR 1.51, 95% CI 1.15–2.00, respectively) following TURP vs. LP. TURP was associated with a 19% (95% CI 0.66–1.00) and 20% (95% CI 0.71–0.91) reduced hazard of reoperation at six months or longer for multimorbid and elderly cohorts, respectively.

Conclusions: Compared to LP, TURP was associated with higher rates of complications for the multimorbid and elderly cohorts overall but a lower hazard of reoperation, supporting its durability.

Female Urology and Incontinence

Poster #68

The state of urology medical student education: Knowledge and exposure to common female urological conditions

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Introduction: A common misconception among medical students is that urology is a male-dominated field, both in terms of providers and patients. The purpose of this study was to describe medical student awareness, exposure, and knowledge of best practices for common female urological conditions. We primarily aimed to assess learning, confidence about clinical conditions, and understanding of best practice with respect to female genitourinary conditions. Secondarily, we aimed to expand awareness of educational shortfalls in contemporary medical education.

Methods: Following IRB-approval, U.S. medical students were anonymously surveyed electronically. Nineteen vignette-based questions were developed using the American Urological Association (AUA) Medical Students Curriculum and Urology Core Curriculum. Questions compromised four general urology subjects: urinary tract infection (UTI), incontinence, transgender health, and sexual dysfunction. Each section was followed by a visual-analog scale quantifying confidence level in the topic and source of student knowledge. Data analysis using ANOVA and descriptive statistics will be performed following survey completion.

Results: Initial results included responses from 102 students (31.4% preclinical, 68.6% clinical) from all six regions of the country (New England, Mid-Atlantic, Southeastern, North Central, South Central, and Western). Overall, students correctly identified answers to 10 of 19 questions (52.6% correct). Notably, 51.2% of students incorrectly characterized incontinence as normal in gravida females and 89.5% incorrectly responded that recurrent UTI can be reduced by urinating after intercourse. Also, 69.7% overlooked the requirement for urine culture before treatment in a patient with a positive urine dipstick and 55.8% incorrectly assumed prostate cancer risk was the same as baseline for a transgender woman on hormonal therapy. Comparing preclinical and clinical students, median confidence of answers overall was 23 and 24.5 out of 100, respectively. More than half (66.7%) of students reported "minimal" urology knowledge overall and cited "common sense" over medical school resources as their major source of knowledge.

Conclusions: It is vital that well-educated medical students master urology essentials prior to graduation irrespective of their future field of practice. Yet, survey results revealed gaps in medical student knowledge and inaccurate perceptions that exist broadly with regard to female urology. We believe these results can be used to help develop medical curricula and better serve our future physicians.

Poster #69

Nocturia independently predicts high cardiovascular risk in women

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Introduction: Growing evidence has identified nocturia as a manifestation of several cardiovascular disease states. We aimed to explore potential associations between nocturia and global atherosclerotic cardiovascular disease (ASCVD) risk, defined by the American College of Cardiology/American Heart Association (AHA/ACC) ASCVD risk calculator, using a large nationally representative study sample from the U.S.

Methods: We used data from seven consecutive cycles of the National Health and Nutrition Examination Survey (2005/06 – 2017/18) to ascertain nocturia frequency and compute ASCVD risk (Goff Jr et al, *Circulation* 2014;129:S49-73) in adults 40–79 years of age. Participants with a prior history of heart failure or overt/known atherosclerotic disease were excluded. Included subjects were classified by whether they met the ASCVD high-risk threshold following current ACC/AHA consensus guidelines (10-year major adverse cardiovascular event risk ≥20%). Logistic regression analyses were used to explore potential associations between nocturia (defined as

Table 1A: Multivariate logistic regression for independent predictors of high ASCVD risk in all subjects

	Model I		Model II		Model III	
Predictor	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**
Nocturia						
No	1 (Reference)	----	1 (Reference)	----	1 (Reference)	----
Yes	1.30 (1.13-1.51)	<0.001*	1.22 (1.06-1.42)	0.007*	1.22 (1.05-1.41)	0.008*
Age (years)						
	1.25 (1.24-1.26)	<0.001*	1.26 (1.25-1.27)	<0.001*	1.26 (1.24-1.27)	<0.001*
Body mass index						
<25 kg/m²	----	----	1 (Reference)	----	1 (Reference)	----
25-29.9 kg/m²	----	----	1.63 (1.39-1.92)	<0.001*	1.60 (1.36-1.88)	<0.001*
≥30 kg/m²	----	----	2.29 (1.89-2.76)	<0.001*	2.19 (1.80-2.67)	<0.001*
Diuretics						
No	----	----	----	----	1 (Reference)	----
Yes	----	----	----	----	1.22 (1.04-1.44)	0.016*

Table 1B: Multivariate logistic regression for independent predictors of high ASCVD risk in women

	Model I		Model II		Model III	
Predictor	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**
Nocturia						
No	1 (Reference)	----	1 (Reference)	----	1 (Reference)	----
Yes	1.35 (1.12-1.64)	0.002*	1.29 (1.06-1.57)	0.011*	1.28 (1.06-1.56)	0.013*
Age (years)						
	1.32 (1.29-1.36)	<0.001*	1.33 (1.30-1.37)	<0.001*	1.33 (1.30-1.37)	<0.001*
Body mass index						
<25 kg/m²	----	----	1 (Reference)	----	1 (Reference)	----
25-29.9 kg/m²	----	----	1.37 (1.05-1.78)	0.019*	1.33 (1.02-1.72)	0.035*
≥30 kg/m²	----	----	2.11 (1.61-2.37)	<0.001*	1.97 (1.48-2.62)	<0.001*
Diuretics						
No	----	----	----	----	1 (Reference)	----
Yes	----	----	----	----	1.36 (1.07-1.72)	0.012*

Table 1C: Multivariate logistic regression for independent predictors of high ASCVD risk in men

	Model I		Model II		Model III	
Predictor	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**	**OR (95% CI)**	**P-Value**
Nocturia						
No	1 (Reference)	----	1 (Reference)	----	1 (Reference)	----
Yes	1.18 (0.95-1.46)	0.120	1.08 (0.86-1.34)	0.506	1.08 (0.86-1.34)	0.517
Age (years)						
	1.26 (1.25-1.28)	<0.001*	1.28 (1.26-1.30)	<0.001*	1.28 (1.26-1.30)	<0.001*
Body mass index						
<25 kg/m²	----	----	1 (Reference)	----	1 (Reference)	----
25-29.9 kg/m²	----	----	1.53 (1.23-1.90)	<0.001*	1.48 (1.18-1.86)	0.001*
≥30 kg/m²	----	----	2.66 (2.05-3.46)	<0.001*	2.47 (1.86-3.27)	<0.001*
Diuretics						
No	----	----	----	----	1 (Reference)	----
Yes	----	----	----	----	1.48 (1.23-1.93)	0.005*

Note: *Denotes statistical significance. Abbreviations: ASCVD – Atherosclerotic Cardiovascular Disease

Poster #69. Table. 1.

≥2 nocturnal voids) and ASCVD risk, as well as age, body mass index (BMI), and diuretic use.
Results: Data were available from a total of 17 900 NHANES participants (52.3% female). The weighted prevalence of nocturia and high ASCVD risk were 27.0% and 10.9%, respectively. Nocturia, older age, increased body mass index, and diuretic use were predictive of high ASCVD risk on univariate logistic regression. Nocturia was predictive of high ASCVD risk on multivariate analysis after adjusting for age, BMI, and diuretic use in all subjects (OR 1.22, 1.05–1.41, p=0.008) and in women (OR 1.36, 1.07–1.72, p=0.012) but not in men (OR 1.08, 0.86–1.34, p=0.517) (Table 1).
Conclusions: Nocturia is associated with high cardiovascular risk. This effect could not be attributed to age, BMI, or diuretic use alone, and appears to be driven by a strong independent association between nocturia and global cardiovascular risk in women. Future studies are needed to elucidate mechanisms underlying observed sex-based differences in the association between nocturia and ASCVD risk, particularly in view of the fact that women remain under-diagnosed and under-treated in the prevention of ASCVD.

Poster #70

The first North American early clinical experience with a novel sublingual vaccine for recurrent urinary tract infection in women

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Introduction: Recurrent UTI (rUTI) in women is associated with massive antibiotic use, widespread morbidity, increasing antibiotic resistance and significant costs. This is the first North American real-world study to gain early clinical practice experience on the effectiveness and safety of Uromune, a novel bacterial sublingual spray vaccine for prevention of rUTI.
Methods: Female subjects with ≥3 documented UTI/year underwent a three-month vaccination treatment period with a further nine-months followup after completion of vaccine treatment (total 12 months). Primary outcome was no UTI following vaccination. Recruitment was put on temporary hold on March 15, 2020 due to a COVID-19-mandated clinical research shutdown. We present the 12-month interim data report in the pre-COVID-19 cohort.
Results: Twenty-five female subjects (mean age 57; range 26–79 years) had been enrolled before recruitment shutdown and 12-month data is available for this cohort. The UTI-free rate for the nine months post-vaccination was 48% (12/25). An 82% reduction in UTI rate was noted after vaccination. The primary and secondary endpoints are described in Table 1. Two mild and self-limited AEs related to the vaccine were reported in one subject. Recruitment restarted July 2020.
Conclusions: This first North American experience with the novel sublingual vaccine, Uromune, demonstrates its safety and potential effectiveness in reducing UTI rate and rendering a significant number of women suffering from rUTIs completely UTI-free.
Funding: Partial funding from Inmunotek S.L.

UTI-Free Rate (proportion subjects with no UTI)	48%
Overall reduction in UTI rate (compared to pre-vaccination)	82%
Proportion subjects with >50% reduction in rUTI	88%
Subjective reporting of moderate or marked improvement	80%
Pleased or Delighted with Quality of Life	56%
Vaccine related adverse reports	1 (mild and self-limited)

Poster #70. Table 1. 12-month effectiveness/safety summary (nine months post-vaccine).

Poster #71

External urethral sphincter volume and long-term post-RALP incontinence outcomes

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Introduction: The etiology of stress urinary incontinence following robot-assisted laparoscopic prostatectomy (RALP) has been described as secondary to internal urethral sphincter and bladder neck anatomic disruption. Membranous urethral length (MUL) on imaging has previously been found to correlate with development of postoperative urinary incontinence. We hypothesized that preoperative external urethral sphincter (EUS) function serves as a protective mechanism against development of post-RALP incontinence. Our objective was to characterize the relationship between preoperative EUS volume on magnetic resonance imaging (MRI) and long-term urinary incontinence outcomes (>1 year post-RALP).
Methods: Patients were queried from a local prostate MRI database between 2017–2019. MRI images were independently read by two physicians. All measurements were made on T2-weighted coronal, axial, and sagittal sequences and included MUL, transverse external urinary sphincter diameter (T), and AP external sphincter diameter (AP). Independent read measurements were averaged. External sphincter volume was calculated by volume of a cylinder (Vol = Pi x Avg rT x Avg rAP x MUL). Urinary incontinence data was collected by telephone survey utilizing the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF). Regression analysis was performed on measurement and survey data (Minitab 19 Statistical Software, State College, PA, U.S.).
Results: Fifty patients responded to the telephone questionnaire and all corresponding EUS measurements were recorded. Descriptive statistics are described in Table 1. Regression analysis of data subsets compared to ICIQ-SF score were not statistically significant (EUS volume [p=0.90], age [p=0.23], time since prostatectomy [p=0.56], and MUL [p=0.43]). Furthermore, EUS volume was not found to have significant correlation to age of the patient (p=0.30).
Conclusions: Post-RALP incontinence severity may be independent of preoperative EUS anatomy. This study found no clear evidence of a correlation between preoperative EUS volume, MUL, or age at time of surgery when compared to ICIQ-SF scores for post-RALP incontinence. Further studies aimed at post-RALP imaging are warranted to further assess EUS anatomic function in relation to long term urinary in continence outcomes.

Variable	Mean	SE Mean	Std Dev	Median	IQR
Age (Yrs)	62.43	0.88	6.19	62.05	6.83
Time Since RALP (Yrs)	2.00	0.08	0.60	2.18	1.16
ICIQ-SF Score	4.04	0.68	4.79	3.00	6.00
MUL (mm)	17.09	0.40	2.85	17.01	3.26
EUS Volume (cm3)	2.51	0.10	0.70	2.35	1.06

Poster #71. Table 1. Patient characteristics and EUS measurements.

Poster #72

Urological conditions and functioning in spina bifida patients over 40 years of age

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Introduction: Spina bifida (SB) is the most common congenital abnormality of the spinal cord and is associated with a number of urological conditions. Advances in treatment have greatly increased life expectancy in this population. It is now estimated that 75% of children with SB will survive into adulthood. The objective of this study was to characterize the relatively novel SB population aged 40 and above.

Methods: We conducted a retrospective chart review of SB patients aged 40 years and above. Patients were identified through the adult multidisciplinary SB clinic at Nova Scotia Health in Halifax, Nova Scotia, Canada. Descriptive statistics were used.

Results: Forty-six patients aged 40 years and above at time of most recent followup were identified. Patients were predominately female (67.4%) with a median age of 46 (range 40–75). The vast majority had a diagnosis of myelomeningocele (86.7%), with 72.7% having undergone a ventriculoperitoneal (VP) shunt. Over 50% were obese with a BMI greater than 30. Clean intermittent catheterization (CIC) was the most common method of bladder management. Half were taking an anti-muscarinic or beta 3 agonist. Incidence of urinary tract infection (UTIs) within the past year was 43.9% while 34.8% of patients had a history of nephrolithiasis and 6.5% had a diagnosis of chronic kidney disease. Most were wheelchair bound (54.5%), while 55% reported independence for all activities of daily living. The vast majority had upper tract imaging (97.8%) and measurement of serum creatinine (80.0%) within one year of most recent followup. Urodynamic studies (UDS) were performed infrequently, with 22.5% undergoing UDS within five years of most recent followup.

Conclusions: SB patients over the age of 40 represent a new and growing patient population. Most are in wheelchairs with varying degrees of independence. Urological conditions are common. Surveillance with periodic UDS is lacking. Further research is needed to further evaluate the needs of this population.

Poster #73

Urinary levels of MiR-491-5p and MiR-592 as potential clinical biomarkers in female aging patients with overactive bladder

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Introduction: MicroRNAs are markers for diseases that provide valuable clinical or diagnostic information, in particular for neurodegenerative diseases. A cohort of female patients with overactive bladder (OAB) was recently reported to present a decrease in their urinary ratio of nerve growth factor (NGF) to its precursor (proNGF). In order to further understand the mechanisms involved in OAB in the perspective of a dysregulation of NGF processing and signaling, we compared the levels of miRNAs related to NGF and proNGF metabolism, and to their receptors p75NTR and TrakA, in the urine of control and OAB subjects, and identify their diagnostic value.

Methods: Urine and blood samples from 20 control and 20 OAB patients (50–80 years) were gathered together with validated questionnaires. The relative expression of microRNAs was measured by RT-qPCR. Results were further adjusted for age, renal function and insulin resistance. Receiver operating characteristics (ROC) for the significantly different miRNAs was tested.

Results: MiR-491-5p, which directly controls the translation of the matrix metalloproteinase-9 "MMP-9", the main enzyme degrading NGF, was significantly decreased in OAB. Similarly, miR-592, which negatively regulates the p75NTR receptor synthesis was down-regulated in OAB. Age, renal function and insulin resistance did not affect these results. ROC curves confirmed a high sensitivity of miR-491-5p and miR-592 for diagnosis. On the other hand, levels of miRNAs that control the expression of proNGF (miR-98-5p, let-7b-5p and let-7d-5p), of the survival receptor TrakA (MiR-92a-3p and 221-5p), of the indirect regulation of MMP-9 (miR-885-5p) and of the markers of nerve integrity (miR-21-5p, miR-132 and miR-212-5p) were not statistically different between groups.

Conclusions: We suggest that the inflammation observed in patients with OAB could originate at least in part from elevated proteolysis of NGF consecutive to high MMP-9 activity and increased expression of p75NTR. The detection of miR-491-5p and miR-592 in urine could be a useful and non-invasive tool for the diagnosis of OAB syndrome in aging women.

Funding: Canadian Urological Association.

Infertility, Impotence, and General Urology

Poster #74

Hollywood urology: A qualitative assessment of urological content in medical TV shows

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Introduction: Over 70% of the general public reports knowing little or nothing about urology. In fact, 20% of people are unaware that urologists also treat females and 75% are unaware that urology involves surgery. Cultivation theory has shown that media consumption shapes viewer (and thus, patient) perceptions, and medical television (TV) often ranks among the most watched shows. However, the prevalence and accuracy of urologic topics on these shows has yet to be examined. Our aim was to qualitatively characterize the portrayal of urologists across multiple contemporary medical TV shows.
Methods: A 5% random sample of episodes was selected from Grey's Anatomy, House, and ER. Iterative cycles of revision based on qualitative methods (grounded theory) were used to generate a standardized data collection tool. Characters, procedures, and surgeries in each episode were recorded alongside hand coded narrative observations to identify themes. Data collected included items such as provider gender, race, level of training, specialty and procedure setting, indication, accuracy, and outcome. Descriptive statistics were tallied across episodes, shows, and the overall sample.
Results: In total, a random sample of 36 episodes were viewed and coded across 25 seasons of three medical TV shows. Just five (14%) episodes included any urological disease or procedure and the majority were not accurate, with nephrolithiasis most commonly shown (Table 1). When urology was highlighted, conditions were generally acute and surgically managed, yet interventions were rarely performed by urologists themselves. Of 204 attending physician character appearances across these episodes, only once was a urologist depicted: a black female in a 2016 episode of Grey's Anatomy. Of 344 total physician character appearances, including trainees, 149 (43%) were female. No characters identified as transgender or non-binary.
Conclusions: Urological conditions are rarely portrayed in current medical TV, and urologists even more rarely make an appearance. This may contribute to the public perception that urologists are not surgeons. On a positive note, the single urologist portrayed in this sample did not reflect the majority demographic of practicing urologists. This may indicate that current public perceptions are more aligned with the increased racial and gender diversity among urology trainees.

Show	Episode	Description
ER	S5E2	Foley placed by nurse at bedside for urinary retention, patient enjoys it
ER	S5E2	Intraoperative finding of methylene blue extravasation in GSW ureteral transection
ER	S6E21	Patient with pyelonephritis remarks that cranberry juice resolves their dysuria
ER	S7E12	Patient seen for prostatitis, addresses the stigma of STDs in the elderly
ER	S7E12	Patient with priapism in ED instructed to masturbate to avoid aspiration procedure
ER	S9E19	Patient with symptomatic kidney stone sent home with opioids and urine strainer
GA	S7E14	Attending surgeon performs nephrolithotomy in OR on patient with abdominal pain

Abbreviations: GA, Grey's Anatomy. S, season. E, episode. ED, emergency department. GSW, gunshot wound. OR, operating room.

Poster #74. Table 1. Urological conditions and procedures in medical televisions episodes viewed.

Poster #75

Diastolic blood pressure reduction is associated with improvement in nocturia

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Introduction: Several atherosclerotic cardiovascular disease risk factors, including hypertension and hypercholesterolemia, have been implicated in increased incidence and severity of nocturia. We aimed to assess the impact of reduction in blood pressure and cholesterol on nocturnal urinary frequency.
Methods: We performed a retrospective analysis of voiding diaries completed by patients treated for lower urinary tract symptoms at a Veterans Affairs urology clinic. Contemporaneous measurements of systolic and diastolic blood pressure and total and LDL cholesterol were abstracted from the visit corresponding to each diary entry. Adult male patients with ≥2 diaries separated by ≥30 days who experienced a reduction in any cardiovascular risk parameter by ≥10% from baseline to followup were included in the present analysis. Mean nocturnal voids, nocturnal urine volume, 24-hour voids, 24-hour urine volume, and maximum voided volume were compared. Linear regression was used to adjust for age and race.
Results: Patients with a ≥10% reduction in diastolic blood pressure (n=74) experienced a crude reduction in nocturnal voids which trended towards significance (2.6 vs. 2.1, crude β-coefficient=-0.059, p=0.07); this became significant after adjustment for age (adjusted β-coefficient=-0.073, p=0.04) and remained significant upon further adjustment for race (adjusted β-coefficient=-0.073, p=0.04). Nocturnal urine volume (744 mL vs. 691 mL, p=0.55), 24-hour voids (11.3 vs. 10.7, p=0.24), 24-hour urine volume (2033 mL vs. 1923 mL, p=0.56), and maximum voided volume (301 mL vs. 305 mL, p=0.90) did not significantly change with reduction in diastolic blood pressure. No significant changes were observed in diary characteristics among patients who experienced ≥10% reductions in systolic blood pressure (n=57), total cholesterol (n=49), or LDL cholesterol (n=72).

Conclusions: Reduction in diastolic blood pressure was associated with improvement in nocturia severity after adjustment for relevant covariates. This link between cardiovascular health and nocturia carries potential important public health implications. Prospective longitudinal research to further elucidate this relationship is warranted.

Poster #76

Canadian provider perspectives on collagenase clostridium histolyticum for the treatment of Peyronie's disease and the impact of its discontinuation

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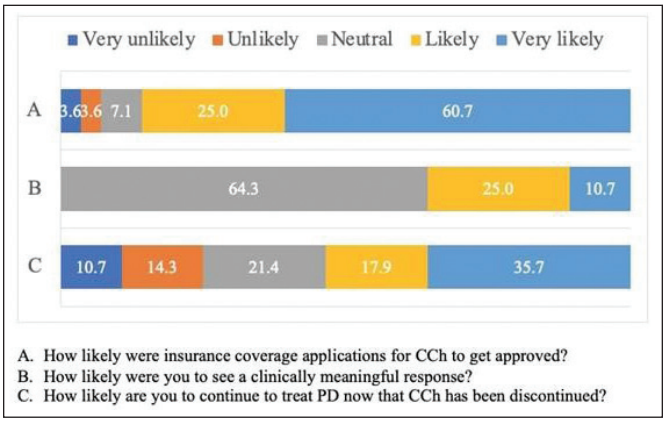
Introduction: Intralesional collagenase clostridium histolyticum (CCh) was the first non-surgical therapy approved for Peyronie's disease (PD). However, CCh's cost and poor market uptake has led to its discontinuation in Europe and Canada. The aim is to better understand Canadian providers' perspectives regarding its treatment efficacy and the potential impact of its discontinuation.

Methods: All Xiaflex®-approved Canadian providers were asked to complete an anonymous 20-question survey using an online platform in the summer of 2020. Analysis consisted of descriptive statistics. Outcomes of interest included previous experience with CCh, protocols used, experience with insurance coverage, clinical and patient-reported outcomes, and provider perspectives on the discontinuation of CCh.

Results: The overall response rate was 48.3% (29/60). Ninety-three percent of respondents felt that CCh was superior to other intralesional therapies for PD. Eighty-six percent reported a patient satisfaction rate of at least 50%, and the majority (75%) saw a clinically meaningful response (Fig. 1). Only 7% expressed difficulty obtaining insurance coverage, with many providers (71%) achieving an insurance approval rate from 75–100%. Only 54% of respondents reported that they would continue treating PD in light of CCh's discontinuation. With the discontinuation of CCh, few will offer intralesional verapamil (36%) or interferon (7%), and most (79%) are now more likely to offer surgical treatment.

Conclusions: Most CCh providers found CCh to be effective and were dismayed by its discontinuation. The discontinuation of CCh in Canada will lead to a reduction in the number of Canadian urologists offering PD treatment, with increased propensity to offer surgical treatment among those who remain. The survey demonstrated that due to the withdrawal of CCh from Canada, physicians' abilities to offer effective medical therapy may become limited, with more providers offering surgical options for PD.



Poster #76. Fig. 1. Provider perspectives on insurance approval, clinical outcomes and whether they would continue treating PD.

Poster #77

Pharmacovigilance analysis of sexual dysfunction associated with finasteride use

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Introduction: Finasteride, a 5α-reductase inhibitor, is used in the management of alopecia and benign prostatic hyperplasia (BPH). Previous reports suggest that some men taking finasteride experience a constellation of adverse events, including sexual dysfunction. We investigated adverse event reports of sexual dysfunction associated with finasteride use.

Methods: We conducted a pharmacovigilance study using VigiBase, the World Health Organization's global database of individual case safety reports. We used the reporting odds ratio (ROR), a surrogate measure of association used in disproportionality analysis, with 95% confidence intervals (CI). Extensive sensitivity analyses included stratifying by indication (BPH and alopecia) and age (<45 and ≥45); comparing finasteride signals to those of drugs with different mechanisms but similar indications (minoxidil for alopecia and tamsulosin for BPH); comparing finasteride to a drug with a similar mechanism of action (dutasteride); and comparing reports of sexual dysfunction before and after 2012.

Results: We identified 7700 reports of sexual dysfunction associated with finasteride use. There was a significant disproportionality signal for sexual dysfunction (ROR 50.30, 95% CI 49.03–51.60) associated with finasteride use. Patients under the age of 45 (ROR 65.73, 95% CI 61.83–69.88) and alopecia patients (ROR 33.62, 95% CI 25.22–44.82) had larger signals than older patients (ROR 30.43, 95% CI 27.12–34.15) and those with BPH (ROR 1.74, 95% CI 1.47–2.07). A signal was detected for minoxidil (ROR 1.92, 95% CI 1.54–2.38). All sensitivity analyses met the threshold of signal significance (Table 1).

Conclusions: We detected disproportional signals of sexual dysfunction linked with finasteride use. Despite sexual dysfunction being more prevalent in older BPH patients, we detected larger signals of sexual dysfunction in young alopecia patients. Sensitivity analyses suggest that reports of sexual dysfunction linked with finasteride use may be confounded by indication and by stimulated reporting. However, confounding alone is unlikely to account for the totality of the signal observed in young patients with alopecia considering the large difference in signal size between finasteride and minoxidil.

Adverse event	Count	Expected Count	Empirical Bayes Estimator (5th percentile)	Reporting Odds Ratio (95% CI)
By Indication (BPH vs. alopecia with finasteride)				
BPH	165	104.79	1.37	1.74 (1.47-2.07)
Alopecia	2425	1611.42	1.45	33.62 (25.22-44.82)
By Age (<45 y and ≥45 y with finasteride)				
<45 y	1329	26.38	48.03	65.73 (61.83-69.88)
≥45 y	329	12.30	24.18	30.43 (27.12-34.15)
Of Other Drugs				
Tamsulosin	711	57.72	11.53	13.03 (12.08-14.05)
Minoxidil	83	43.49	1.57	1.92 (1.54-2.38)
Dutasteride	430	17.61	22.28	26.77 (24.24-29.56)
By Period				
Before 2012	1396	73.93	18.02	22.02 (20.80-23.31)
After 2012	6304	115.50	53.37	79.63 (77.32-82.01)

Poster #77. Table 1. Results of sensitivity analyses.

Poster #78

Predictors of adult acquired buried penis reconstruction offers and patient acceptance

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Introduction: Adult acquired buried penis (AABP) is a condition of phallic burying that has historically been regarded as a cosmetic problem related to poor quality of life. Recent literature has shown associations with urethral stricture and malignancy while illustrating improved quality of life with reconstruction. These considerations add to the complexity of preoperative counseling. The objective of this study is to examine the preoperative factors associated with those undergoing reconstruction at a high-volume center.

Methods: A retrospective review of the medical record identified patients with AABP from 2008–2018. Adults who presented for outpatient reconstructive urology evaluation of AABP were included. Patients were grouped by an offer of surgery and a decision to undergo reconstruction. Comorbidities, symptoms, prior treatments, and physical exam findings were compared.

Results: A total of 128 unique AABP evaluations were identified, 83 were offered surgery initially and 51 accepted this offer. Average age was 53.8 years (SD 15) and BMI was 43.7 (SD 10.1). Poor urinary hygiene, prior penile surgery, and inability to exhume the phallus on exam were more common in those offered surgery. Demographics, comorbid medical conditions, other urologic complaints and history of premalignant lesions were not associated with an offer of surgery (Table 1). Logistic regression determined that those with poor hygiene were nearly three-times more likely to be offered surgery (OR 2.91, CI 1.2–7.1), while a full penile exam carried a significantly reduced likelihood of being offered reconstruction (OR 0.29, CI 0.09–0.91). Among those offered surgery, a decision to undergo the procedure was associated with younger age (51.3 vs. 59.3 years, p=0.02) and lower prevalence of diabetes (41.2% vs. 71.9%, p=0.01); no significant predictors of acceptance were identified.

Conclusions: Surgery offers were more likely in those with poor hygiene and a completely buried phallus, suggesting some consideration of cosmetics, quality of life, and cancer risk without adequate exam. Patients who accepted surgery tended to be younger with fewer comorbidities, which likely represents a decision based on their overall fitness. The characteristics of those who underwent surgery do not suggest a consideration of the improved quality of life with reconstruction or underlying malignancy risk which may highlight areas for further patient counselling.

	All Patients	Surgery Offered	Surgery Not Offered	p-value
n	128	83	45	
Age (mean, SD)	53.8 (15)	54.4 (15.3)	52.8 (15.7)	0.61
BMI (mean, SD)	43.7 (10.1)	44.4 (10.1)	42.4 (10.1)	0.34
Medical History (n, %)				
CAD	30 (23.4)	16 (19.3)	14 (31.1)	0.2
Asthma/COPD/OSA	56 (43.8)	36 (43.4)	20 (44.4)	1
DM	71 (55.5)	44 (53.0)	27 (60.0)	0.57
Smoking	69 (53.9)	43 (51.8)	26 (57.8)	0.64
Etiology (n, %)				
Lymphedema	19 (14.8)	13 (15.7)	6 (13.3)	0.93
Cicatrix	44 (34.4)	37 (44.6)	7 (15.6)	0.002
Obesity	122 (95.3)	78 (94.0)	44 (97.8)	0.66
Presenting Symptoms (n, %)				
Poor hygiene	83 (64.8)	64 (77.1)	19 (42.2)	<0.001
Urinary obstruction	61 (47.7)	38 (45.8)	23 (51.1)	0.7
Erectile dysfunction	34 (26.6)	25 (30.1)	9 (20.0)	0.3
Prior treatment (n, %)				
Stricture treatment	41 (32)	24 (28.9)	17 (37.8)	0.41
Penile surgery	42 (32.8)	34 (41.0)	8 (17.8)	0.01
Topical steroids	16 (12.5)	10 (12.0)	6 (13.3)	1
Exam (n, %)				
Unable to examine phallus	62 (48.4)	49 (59.0)	13 (28.9)	<0.001
Premalignant lesion	30 (23.4)	21 (25.3)	9 (20.0)	0.65

Poster #78. Table 1. Presenting factors in AABP evaluations based on offers of surgery.

Poster #79

Posterior-inferior scrotal denervation: A potential treatment for patients with refractory scrotal pain

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Introduction: A microscopic spermatic cord denervation (MSCD) is a treatment option for patients with refractory scrotal pain. However, 8–15% of patients fail to improve with this procedure. The posterior-inferior scrotum is innervated by the perineal nerve, a branch of the pudendal nerve and is not targeted during a standard MSCD. We hypothesized that patients with pain originating from the perineal nerve could be identified based on response from a posterior-inferior scrotal nerve block and that performing a posterior-inferior scrotal denervation in these patients would help alleviate their pain.

Methods: All patients with persistent pain following MSCD were offered a posterior-inferior spermatic cord block. This was performed by injecting 20 mL of 0.5% bupivacaine in the posterior scrotum, inferior to the lower pole of the testicle, between the median raphe and the lateral border of the scrotum on the affected side. The block was considered successful if patients had a >50% reduction in pain for >1 hour. Patients with successful blocks were offered a posterior-inferior scrotal wall denervation. This was performed by making a 4 cm incision 1 cm lateral to the median raphe on the posterior-inferior scrotum. A 4x1 cm section of tissue was then resected and included all scrotal layers between the skin and tunic vaginalis. Prior to the denervation surgery, patients were evaluated with ultrasound and any identified abnormal pathology was address at the time of the procedure. Patient were evaluated for resolution of pain using a visual analog scale (VAS) one month postoperatively.

Results: Seven patients failed MSCD and agreed to undergo the posterior-inferior scrotal block. Mean time from MSCD was 10.5 (7–15) months. Mean preoperative pain was 5 (4–7) on VAS. Mean block effect time was 7.4 (4–14) hours. All patients responded to the block with a mean pain reduction of 87% (60–100%). All patients underwent the denervation procedure. Concurrent scrotal procedures were performed in 6/8 patients (i.e., epididymectomy, partial epididymectomy, spermatocelectomy). At one-month followup mean pain reduction was 82% (57–100%).

Conclusions: Pain signals from the pudendal nerve may contribute to treatment failure following MSCD. Preliminary data supports the use of a posterior-inferior scrotal denervation in these patients and a preoperative posterior-inferior scrotal block may be an effective screening tool. A larger prospective trial and long-term followup is warranted.

Poster #80

She for erectile dysfunction: A statistical analysis of female urologists treating male sexual dysfunction

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Introduction: Female representation within urology is increasing annually. The 2018 AUA census reported 9.2% of practicing urologists identifying as female. Previous studies report females treat gender-concordant patients at a disproportionately high rate, but none have looked at the distribution of female urologists treating uniquely male conditions. We aim to evaluate the proportion of females providing care for male sexual dysfunction.

Methods: We used Medicare Fee-For-Service Part-B and Part-D Provider Utilization and Payment Data for the 2014–2018 calendar years to identify higher volume urologists for erectile dysfunction (ED) management. We chose phosphodiesterase type 5 inhibitor (PDE5i) prescription data to represent first-line ED treatment and inflatable penile prosthesis (IPP) placement data to represent advanced ED treatment. Claims for sildenafil, tadalafil, and vardenafil were used to extract PDE5i prescription data. Healthcare Common Procedure Coding System codes were used to extract data for IPP placement and replacement. Higher-volume providers were defined as >10 prescriptions per calendar year or >10 procedures

per calendar year. Chi-squared test was used for statistical analysis of categorical variables.
Results: Among 9098 urologists receiving Medicare payments in 2018, 845 (9.3%) were female and 8253 (90.7%) were male. Two thousand four hundred and sixty-six higher-volume urologists prescribed PDE5i in 2018; 3.4% were female (83:2383, p<0.001). There was also gender disparity among urologists performing >10 IPP in 2018 at 1.1% (1:88, p=0.013). Of all 6988 IPP placements in 2018, 19 (0.3%) were placed by higher-volume female urologists and 1909 (27.3%) were placed by higher-volume male urologists.
Conclusions: Although the Medicare Fee-For-Service Part-B and Part-D database represents only one portion of the insured population, the information on gender representation within the database is representative of the current demographics. In this sample of urologists, a disproportionally small number of female urologists are managing ED. Further studies are needed to better quantify female representation in the field of male sexual medicine.

Poster #81

Sperm motility on testicular sperm extraction (TESE) samples defines spectrum of normalcy in post-vasectomy patients

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Introduction: Sperm motility on TESE has not yet been examined in iatrogenically azoospermic men. While previous studies report that patient age does not affect kinetics after vasectomy reversal, modifiers for sperm motility have not been investigated on TESE samples prior to reversal. Obesity, length of time post-vasectomy, high FSH, or low testosterone levels may signify unhealthy seminiferous tissue, and a relationship between these variables may demonstrate whether a TESE is indicated for post-vasectomy patients who are interested in in vitro fertilization (IVF). The objective of this study was to determine whether there is an association between these variables and sperm motility in testicular sperm extraction (TESE) samples.

		Sum of Squares	Degrees of freedom	Variance	F	p
BMI	Between Groups	21.43	2	10.71	0.7718	0.4688
	Within Groups	569.2949	41	13.88		
	Total	590.7270	43			
FSH	Between Groups	22.27	2	11.135	0.8291	0.4583
	Within Groups	174.6055	13	13.4312		
	Total	196.88	15			
Testosterone	Between Groups	35276.5	2	17638.27	0.6721	0.5245
	Within Groups	419875.6	16	26242.23		
	Total	455152.17	18			
Length Of Time	Between Groups	0.3208	2	0.1604	0.0038	0.9962
	Within Groups	1932.08	46	42.002		
	Total	1932.399	48			

Poster #81. Table 1. Results of analysis of variance for difference between group means for BMI, FSH, testosterone, and length of time post-vasectomy in TESE motility groups 0%, 1–4%, and >5%.

Methods: Our cohort included 250 men who presented for testicular sperm extraction at our tertiary men's fertility clinic between 2015 and 2020. Clinical data, including gonadal hormone levels, BMI, and vasectomy status were reviewed. Patients with azoospermia on TESE sample were excluded from the analysis. Sperm motility was categorized into groups of 0%, 1–4%, and >5% following TESE. Analysis of variance was used to compare categorical variables of sperm motility grouping in post-vasectomy patients. Institutional IRB clearance for a retrospective analysis was granted.
Results: A total of 53 post-vasectomized men were included in the analysis. There were no statistically significant differences between group means for BMI as determined by ANOVA (F(2,41)=0.7718), p=0.4688). Of note, in patients who received laboratory testing of gonadal hormone levels, there were no statistically significant differences between group means for FSH or testosterone levels as determined by ANOVA (F(2,13)=0.8291, p=0.46; F(2,16)=0.6721, p=0.5245). Additionally, no significant difference was observed between group means for length of time post-vasectomy between motility categories (F(2,46)=0.0038, p=0.9962).
Conclusions: This is the first study examining potential sperm motility modifiers on TESE samples. Our results indicate no statistically significant associations between sperm motility and BMI, gonadal hormone levels, or length of time post-vasectomy. There is an unknown variable or idiopathic process for post-vasectomy variance in motility, while these studied modifiers remain normal and insignificantly different. The findings are valuable for guiding specialists in preparation of pre-TESE workup, and the presented results suggest that pre-TESE examination of these variables may not be indicated in determining post-vasectomy fecundity for IVF.

Poster #82

Multi-institutional feasibility of dorsal onlay urethroplasty for membranous urethral stricture following endoscopic prostate procedures: Operative results and multivariate analysis

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Introduction: Reconstruction of membranous urethral stenosis in patients with previous transurethral resection of the prostate (TURP) or other endoscopic prostate ablative procedures is a surgical challenge that is poorly described. Here we evaluate multi-institutional results of dorsal onlay buccal mucosal graft urethroplasty (DBMGU) for urethral stricture in these patients
Methods: A multi-institutional review of DBMGU in patients with membranous or bulbomembranous urethral stenosis from 2002–2020 and a minimum of six months followup was conducted. The primary objective was evaluation of urethral patency and stenosis recurrence with identification of risk factors using stepwise logistic regression (p=0.1 entry and p=0.05 stay criteria) and assessment of de novo stress urinary incontinence (SUI). Secondary objectives included an evaluation of changes in voiding, sexual function, and patient satisfaction.
Results: One hundred seven men with post-TURP urethral stenosis received DBMGU. Mean age, stenosis length, and BMI were 69±9.5 years, 3.5±1.8 cm, and 27.7±5, respectively. Prior endoscopic procedures included: 47 (44%) monopolar TURP, 33 (30.8%) bipolar TURP, 16 (15%) Greenlight laser, nine (8.4%) holmium laser enucleation, and two (1.9%) transurethral bladder neck incision. Radiotherapy was performed in 10 (9.3%). At a mean of 59.3±45.1 months followup (range 6–148), stenosis recurred in 10 patients (9.35%). Univariate analysis revealed diabetes, smoking, monopolar TURP, associated radiation, prior dilatation, prior DVIU, stricture length and postoperative complications within 90 days were included in the regression model for recurrence. Multivariate analysis confirmed postoperative complications (OR 12.5, p=0.009), associated

radiation (OR 8.3, p=,.016), and ≥2 dilatations before urethroplasty (OR 8.3, p=0.032) as independent predictors of recurrence. Only one patient (0.9%) developed de novo SUI following DBMGU. Patients had improvement in Qmax (6.2 to 16.8 cc/s; p<0.001), PVR (128 to 60 cc, p<0.001), SHIM (11.5 to 11.7, p=0.028), IPSS (20 to 7.7; p<0.001), and QoL (4.4 to 1.7, p<.001). Eighty-seven cases (81.3%) reported GRA of +2 or better.
Conclusions: DBMGU is effective in treating post-TURP bulbomembranous stenosis. This non-transecting approach confers a very low risk of de novo SUI, preserves erectile function, and improves voiding function. Further work is needed to compare this technique with other approaches in this challenging setting.

Poster #83

Factors affecting penile length shortening in patients undergoing plication for Peyronie's disease: An update

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Introduction: Surgical correction of penile curvature due to Peyronie's disease with tunica albuginea plication (TAP) has the theoretical disadvantage of penile length loss. One previous study in patients undergoing a plication using a modified Nesbit surgical technique demonstrated a loss of penile length is associated with preoperative length, degree of curvature, and direction of curvature. Using the plication technique first described by Gholami and Lue, we evaluate the factors affecting loss of penile length of patients to help improve preoperative patient discussions undergoing TAP with this technique.
Methods: In this pilot study, a total of 15 patients underwent TAP for Peyronie's disease between September 2019 and January 2021 by a single surgeon. Data was gathered on preoperative and postoperative penile length from pubis to corona (PC) and base of penis to meatus (BM), degree of curvature, direction of curvature, and number of plication sutures used.
Results: The mean age at surgery was 55.2 years (range 35–70). Mean maximal direction of curvature was 50 degrees (range 30–80). Number of sutures used to correct curvature was 4–10. All curvature was reduced to less than 15 degrees with plication. The mean loss of length after procedure PC was 0.43 cm (range 0.0–1.3). The mean loss of length from BM was 0.42 cm (range 0.1–1.0). Using linear regression analysis, change in length was significantly correlated to preoperative penile length from PC (r^2 97% and p<0.001) and BM (r^2 99% and p<0.001). Correlation but not statistical significance was seen in the number of sutures used (r^2 27% and p=0.047). It did not appear that change in penile length is correlated to direction of curvature or degree of curvature.
Conclusions: TAP is an effective way to correct curvature and results in modest penile shortening. The loss of length is dependent on preoperative penile length and shows correlation to the number of plication sutures. More data are needed to fully evaluate the factors involved in penile shortening in patients undergoing this procedure.

Poster #84

Effects of two years of oral testosterone undecanoate (TU) administration (JATENZO®) on liver function and other safety measures in hypogonadal men

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Introduction: Oral testosterone (T) replacement therapy (TRT) is the preferred choice for many hypogonadal men. Historically, the only oral TRT approved in the U.S. was methyl-T but it is associated with hepatotoxicity. Recently, the FDA approved the first, oral testosterone undecanoate (TU) formulation, JATENZO®. The safety of this novel, oral TU formulation was evaluated in hypogonadal men dosed for up to two years.
Methods: Two trials were conducted in hypogonadal men (serum T ≤300 ng/dL) aged 18–75 years. Trial 1 was a two-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 two full years of data. Safety was assessed by physical exam, AE reporting, and routine clinical laboratory measurements.
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 months 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± 2.8 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 from 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. The long-term efficacy and safety profile of oral TU may provide a treatment option that avoids issues associated with other TRTs, such as injection site pain or transference to partners and children.
Funding: Clarus Therapeutics.

Poster #85

Compliance rates of post-vasectomy sperm analysis in home and lab settings: Identifying influential features

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Introduction: Post-vasectomy semen analysis (PVSA) is the recommended method for confirming intervention success based on guidelines published by the American Urological Association; however, current literature reports poor PVSA compliance rates. Our institution used a home test PVSA between 2014 and 2017 to address this issue but have since reverted back to lab-based testing. In this study, we compare compliance rates in home-based vs. lab-based testing and describe factors that may influence completion rates in each cohort.
Methods: We retrospectively identified adult patients who underwent a vasectomy at our institution by one surgeon from December 2014 to January 2017 and June 2019 to August 2020. Home-based PVSA compliance rates in the 2014–2017 period were compared to lab-based PVSA compliance rates in the 2019–2020 period. Socioeconomic, demographic, and patient-specific parameters were also collected to assess whether certain descriptive features influence compliance rates. The odds ratio of PVSA completion between the two cohorts was assessed via binary logistic regression analysis.
Results: We identified 337 patients who underwent a vasectomy by a single surgeon at our institution (136 from the 2014–2017 group and 201 from the 2019–2020 group). Compliance with PVSA was 29% for the home-based cohort and 46% for the lab-based cohort. Patients in the home-based cohort were less likely to complete PVSA than the lab-based cohort (OR 0.42, 95% CI 0.25–0.71).
Conclusions: Compliance with PVSA testing was low in both the home and lab settings. Patients using home-based PVSA were less likely to complete the test than those using lab-based analysis. Future steps include multiple linear regression analyses to identify specific patient characteristics that predict trends in PVSA compliance rate with respect to the test setting. These findings may help surgeons identify groups that would benefit from home- or lab-based testing more than the other, thereby improving overall PVSA compliance rates.

Oncology – Bladder, Renal, Testes

Poster #86

Sexual dimorphism in outcomes of non-muscle invasive bladder cancer: A role of CD163+ macrophages, B cells, and PD-L1 immune checkpoint

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Introduction: Non-muscle-invasive bladder cancer (NMIBC) is significantly more common in men than women. However, female patients with NMIBC often present with more aggressive disease and do not respond as well to immunotherapy treatments. We hypothesized that sexual dimorphism in the tumor immune microenvironment (TIME) may contribute to the inferior clinical outcomes observed in female patients.

Methods: To test this hypothesis, we interrogated the expression patterns of genes associated with specific immune cell types and immune checkpoint pathways using tumor whole transcriptome profiles from male (n=357) and female (n=103) patients with NMIBC. High-grade tumors from female patients exhibited significantly increased expression of CD40, CTLA4, PDCD1, LAG3, and ICOS immune checkpoint genes. Next, we evaluated the density and spatial distribution of CD8+Ki67+ activated T cytotoxic cells, FoxP3+ T regulatory cells, CD103+ tissue resident T cells, CD163+ (M2-like tumor associated macrophages), CD79a+ (B-cells), PD-L1+ (Programmed-Death Ligand-1) and PD-1+ cells using multiplexed immunofluorescence in an independent cohort of 332 patient tumors on a tissue microarray (n=259 males and n=73 females).

Results: Tumors from female patients showed significantly higher density of CD163+ macrophages and PD-L1+ cells compared to tumors from male patients. Notably, increased abundance of CD163+ macrophages and CD79a+ B cells independently associated with decreased recurrence free survival.

Conclusions: These findings are the first evidence of sex-associated differences in the TIME of NMIBC.

Poster #87

Quality improvement for quality of life: Low-dose buprenorphine decreased opioid utilization protocol in robot-assisted radical cystectomy

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Introduction: Opioid-naive individuals often first encounter narcotics during major surgery, such as robot-assisted radical cystectomy (RARC) for the treatment of muscle-invasive bladder cancer. Pain management following RARC with full-agonist opioids has been the cornerstone of analgesia despite associated toxicity and risk for dependence. New literature describes non-opioid enhanced recovery pathways, yet none define the merits of decreased opioid utilization (DOU) using partial-agonist opioid low-dose buprenorphine (LDB; LDB-DOU protocol). With recent re-evaluation of prescribing requirements by the FDA, LDB may become more accessible. We implemented a quality improvement initiative using an LDB-DOU protocol to assess the feasibility and outcomes of minimized perioperative opioid burden.

Methods: The LDB-DOU protocol includes standardized recovery pathways, a multimodal analgesia schedule, and shared pain management expectations. Analgesic management was recorded and converted to morphine milligram equivalent (MME) for comparison. Relevant preoperative, operative, and postoperative recovery details were documented to assess clinical milestones for recovery, readmission rates, and pain control. Prior opioid use was identified using the prescription drug monitoring program.

Results: Twenty medically complex patients (CCI 6, ASA 3) followed the LDB-DOU protocol after admission for palliative or curative RARC with ileal conduit urinary diversion. The median operative time was 342 minutes, blood loss was 300 mL, and hospital stay was three days. Respectively, median total dosage of LDB and MME were 0.375 mg and 20/day, allowing for advancement to low-residue diet on postoperative day (POD) two. One patient experienced transient ileus (POD 2) and two faced 30-day complications (Clavien 2, 3). None required outpatient narcotic management.

Conclusions: The LDB-DOU protocol allows for perioperative narcotic mitigation and enhanced quality of life. Improvements in clinical milestones of recovery included adequate analgesia, short hospital stays, fast diet advancement, and low incidence of postoperative ileus and 30-day adverse events. Compared to morphine, LDB is 20-50 times more potent for pain modulation but offers nominal euphoric reward due to its distinctive receptor-binding. It delivers a profile of enhanced safety with optimal antinociception. Though further studies are needed, the use of an LDB-DOU protocol is a feasible alternative to both standard practice and the newer non-opioid approaches.

Poster #88

Social determinants of health associated with increased re-admissions to non-index hospitals

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Introduction: Radical cystectomy is associated with one of the highest re-admission rates of any surgery, hovering around 25%. Re-admissions occur both at the hospital at which patients received their surgery (index readmission) and at other hospitals (non-index readmission). Non-index re-admissions have been associated with worse outcomes. We sought to examine characteristics associated with being re-admitted to a non-index hospital

Methods: Using the Pennsylvania Cancer Registry linked to the Pennsylvania Health Care Cost Containment Council database, we identified all patients with non-metastatic muscle-invasive bladder cancer from 2010–2016 who were treated with radical cystectomy. The primary outcome was re-admission to an index versus non-index hospital. We fit a multivariable logistic regression model to assess predictors of being re-admitted to a non-index hospital, adjusting for several patient demographic and clinical characteristics. Area deprivation index (ADI) was used as a surrogate for socioeconomic status and reported as quartiles. The 4th quartile represents the lowest socioeconomic status. Urban, large town, and rural residence was defined using the rural-urban commuting area codes.

		Non-Index Readmissions OR	[95% CI]
Age	<60	Reference	Reference
	60-69	0.63	[0.31-1.28)
	70-79	0.47	[0.20-1.11]
	80+	0.60	[0.21-1.71]
Sex	Male	Reference	Reference
	Female	0.58	[0.29-1.15]
Race	White	Reference	Reference
	African American	0.60	[0.16-2.22]
	Asian	<0.001	[<0.001-999]
	Other	1.77	[0.40-7.87]
Ethnicity	Non-Hispanic	Reference	Reference
	Hispanic	<0.001	[<0.001-999]
Readmission Hospital Bed Size	<=250	Reference	Reference
	251-500	1.72	[0.84-3.52]
	>500	1.22	[0.62-2.39]
Elixhauser Comorbidity Index (ECI)	<=5	Reference	Reference
	6-13	1.55	[0.82-2.93]
	>13	**3.22**	[1.75-5.93]
Tumor Stage	<=T2	Reference	Reference
	T3	1.51	[0.79-2.90]
	T4	0.63	[0.26-1.54]
N Stage	N0/Nx	Reference	Reference
	>=N1	1.68	[0.83-3.40]
Residence	Urban	Reference	Reference
	Large Town	1.35	[0.56-3.23]
	Rural	**4.28**	[1.41-12.9]
Insurance	Private	Reference	Reference
	Medicare	1.84	[0.92-3.67]
	Medicaid	0.98	[0.38-2.51]
	Other Government	<0.001	[<0.001-999]
	Uninsured	<0.001	[<0.001-999]
	Other/Unknown	6.67	[0.36-122]
Socioeconomic: Area deprivation Index (ADI)	Q1	Reference	Reference
	Q2	0.82	[0.41-1.64]
	Q3	0.87	[0.43-1.76]
	Q4	0.58	[0.26-1.31]

*Factors include age, sex, race, ethnicity, hospital bed size, ECI, Tumor stage, N stage, residence, insurance, and ADI.

Poster #88. Table 1. Multivariable regression analysis of factors associated with non-index re-admissions*.

Results: We identified 2113 patients with muscle-invasive bladder cancer who underwent radical cystectomy. Of those, 517 (24.5%) patients were re-admitted within 30 days. Non-index re-admissions accounted for 86 (4%) of these patients. Patients who had higher comorbidity burden, positive N stage, and rural residence were significantly associated with higher non-index re-admissions. On multivariable analysis, high comorbidity index (odds ratio [OR] 3.22) and rural residence (OR 4.28) were independent predictors of non-index re-admissions (all p<0.05).
Conclusions: Rural residence and high comorbidity burden were predictors of re-admissions to non-index hospitals after radical cystectomy, while insurance and socioeconomic status were not. Metastatic disease was also associated with increased non-index re-admissions. Development of policy initiatives may help assess disparities in rural residence and healthcare access.
Funding: Dr. Grajales was supported in part by the 2020 Urology Care Foundation Residency Research Award Program and The Kahlert Foundation. Dr. Jacobs is supported in part by the Shadyside Hospital Foundation

Poster #89

Renal function after robot-assisted radical cystectomy: Ileal conduit vs neobladder — a propensity score matched analysis

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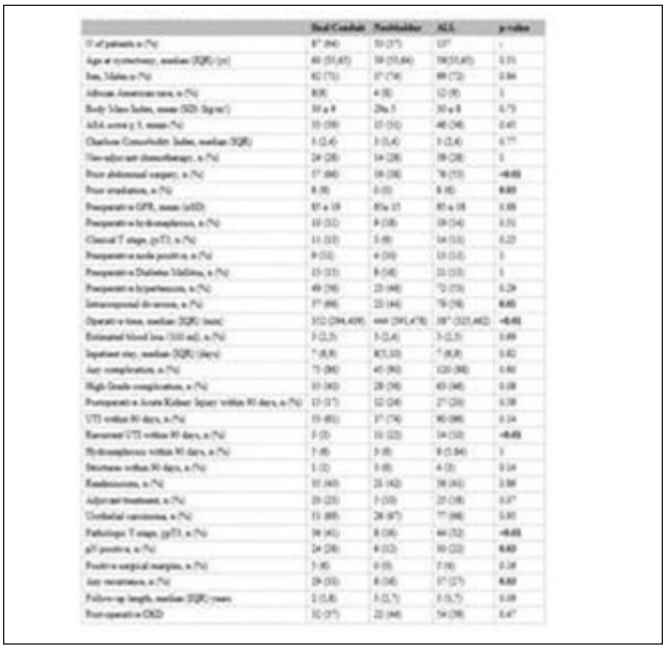
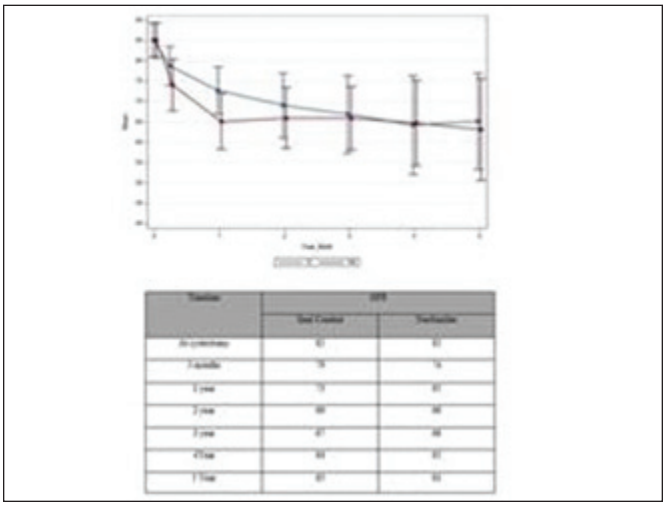
Introduction: We sought to analyze the long-term effects of continent (neobladder) compared to incontinent (ileal conduit) urinary diversion on renal function after robot-assisted radical cystectomy (RARC).
Methods: We performed a retrospective review of our departmental database. Estimated glomerular filtration rate (eGFR) was calculated using the Chronic Kidney Disease Epidemiology Collaboration equation (CKD-EPI). Neobladder and ileal conduit patients were matched in a 1:2 ratio. Descriptive analysis was used to summarize the data. Trend plots were generated using baseline and followup creatinine values to compare eGFR at three months and then annually for five years. Multivariate (MV) linear analysis was performed to assess variables associated with eGFR.
Results: One hundred and thirty-seven patients were identified (neobladder=50 and ileal conduit=87) with median followup time of three (IQR 1–7) years. Median (IQR) age was 59 (55–65) years and 72% of the patients were males. Recurrent urinary tract infections (UTI) were more common in the neobladder group (22% vs. 3 %, p <0.01) (Table 1). No statistically significant difference in eGFR was noted between the two groups at any point up to five years (Fig. 1). On MV linear analysis, age (-0.59 ml/min for every year older), body mass index (-0.52 ml/min for every Kg/m^2), preoperative eGFR (+0.51 ml/min per unit increase in eGFR), recurrent UTI (-14.03), and time since RARC (-7.52 in year 1; -9.06 in year 2; -10.78 in year 3) were significantly associated with eGFR (Table 2).
Conclusions: Ileal conduits and neobladders demonstrated a similar effect on eGFR up to five years after RARC. Recurrent UTIs were the strongest variable associated with worse eGFR.
Funding: Roswell Park Alliance Foundation.



Poster #89. Table 1.

Poster #89. Table 2.



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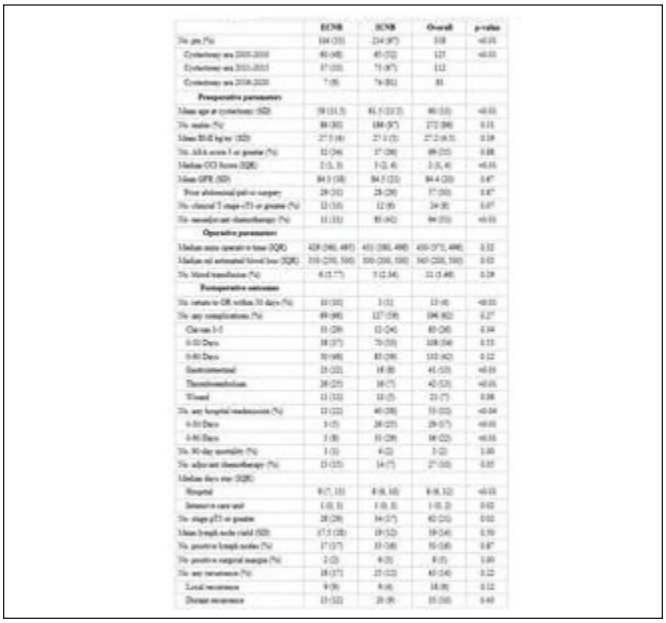

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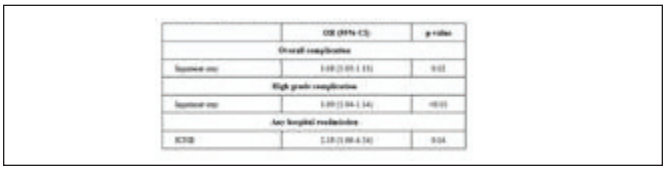
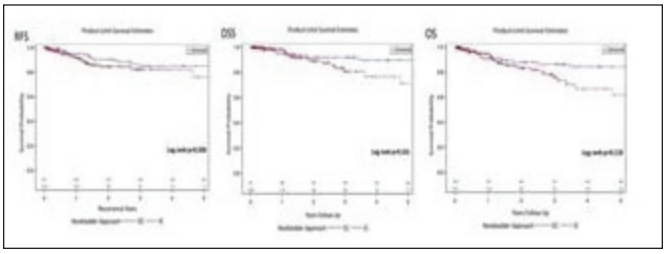


Poster #90. Table 2



Poster #90. Fig. 1.

Poster #90

Intracorporeal vs. extracorporeal neobladder after robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium

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Introduction: We aimed to compare perioperative and oncological outcomes of intracorporeal (ICNB) and extracorporeal (ECNB) following robot-assisted radical cystectomy (RARC).

Methods: A retrospective review (2005–2020) of International Robotic Cystectomy Consortium (IRCC) database was performed. The Cochran-Armitage trend test was used to assess utilization of ICNB over time. ICNB and ECNB recipients were compared in terms of perioperative, oncologic, and survival outcomes. Multivariable analysis was used to identify variables associated overall complications, high-grade complications, and readmissions. Kaplan Meier curves were used to depict recurrence free (RFS), disease specific (DSS), and overall survival (OS).

Results: Three hundred and eighteen patients received neobladder, 67% underwent ICNB. ICNB utilization increased significantly over time (p<0.01). Patients who received ICNB experienced fewer 30-d reoperations (1% vs. 10%, p<0.01). There were no significant differences in overall and high-grade complications. They experienced fewer gastrointestinal (8% vs. 22%, p<0.01) and thromboembolic complications (7% vs. 25%, p<0.01). They were readmitted more frequently (38% vs. 22%, p=0.04) (Table 1). On multivariate analysis, ICNB was significantly associated with readmissions (OR 2.19, 95% CI 1.06–4.54, p=0.03) (Table 2). Both groups exhibited similar RFS, DSS, and OS (log rank p=0.34, 0.16, and 0.11, respectively) (Fig. 1).

Conclusions: Patients who underwent ICNB had fewer 30-day reoperations, gastrointestinal and thromboembolic complications but were readmitted more frequently compared to those who received ECNB. Long-term oncological and survival outcomes were similar between ICNB and ECNB recipients.
Funding: Roswell Park Alliance Foundation and the Vattikuti Foundation Collective Quality Initiative.

Poster #91

Relapses rates and patterns for pathological t0 after robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium

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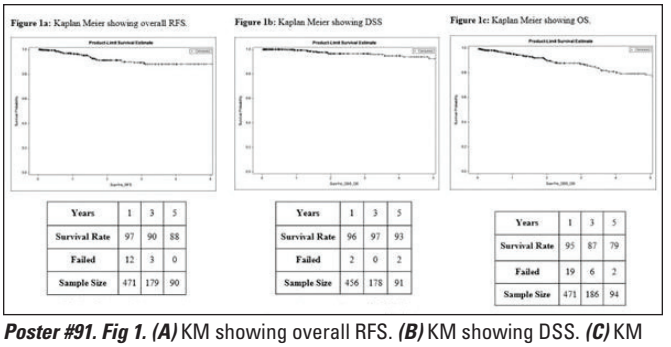
Introduction: We investigated the outcomes of pT0 after robot-assisted radical cystectomy (RARC).
Methods: A retrospective review of the International Robotic Cystectomy Consortium database was performed. Patients with pT0 after RARC were identified and analyzed. Data were reviewed for demographics, and pathologic outcomes. Kaplan-Meier (KM) curves were used to depict recurrence-free survival (RFS), disease-specific survival (DSS), and overall survival (OS). Multivariate stepwise Cox regression models were used to identify variables associated with RFS and OS.
Results: Four hundred and seventy-one patients with pT0 were identified. Median age was 68 (IQR 60–73), with a median followup of 20 months (IQR 6–47); 37% received NAC and 5% had pN-positive disease. Eight percent of patients experienced disease recurrence: 3% and 5% local and distant recurrence, respectively. The most common sites of local and distant recurrences were the pelvis (1%) and lungs (2%), respectively. No patient had port-site or peritoneal recurrence. Five-year RFS, DSS, and OS were 88%, 93%, and 79%, respectively (Fig. 1). Predictors of RFS were age (HR 1.05, 95% CI 10.01–1.09, p=0.02), pN+ve (HR 11.48, 95% CI 4.47–29.49, p<0.01), and re-operations within 30 days (HR 4.77, 95% CI 2.01–14.64, p<0.01).



Poster #91. Fig 1. (A) KM showing overall RFS. ***(B)*** KM showing DSS. ***(C)*** KM showing OS.

	Hazard Ratio	95% Confidence Interval	p-value
RFS			
Age	1.05	1.01 – 1.09	0.02
pN+ve	11.48	2.08 – 14.64	<0.01
Reoperations within 30 days	5.53	2.08 – 14.64	<0.01
OS			
Chronic Kidney disease	3.24	1.45 – 7.23	<0.01
Neoadjuvant chemotherapy	0.41	0.18 – 1.92	0.03
pN+ve	4.37	1.46 – 13.06	<0.01
Reoperations within 30 days	2.64	1.08 – 6.43	0.03

Poster #91. Table 1. Multivariable stepwise Cox proportional hazards modeling predictors of RFS and OS.

Predictors of OS were chronic kidney disease (HR 3.24, 95% CI 1.45–7.23, p<0.01), neoadjuvant chemotherapy (HR 0.41, 95% CI 0.18–0.92, p-0.03), pN+ve (HR 4.38, 95% CI 1.46–13.06, p<0.01), and re-operations within 30 days (HR 2.64, 95% CI 1.08–6.43, p=0.03) (Table 1).
Conclusions: Despite pathologic T0 status at RARC, positive nodal disease occurred in 5%, and 8% of patients relapsed. Node status is the main predictor for recurrence in pT0.
Funding: Roswell Park Alliance Foundation and the Vattikuti Foundation Collective Quality Initiative.

Poster #92

Impact of prolonged pneumoperitoneum on recurrence rates after robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium

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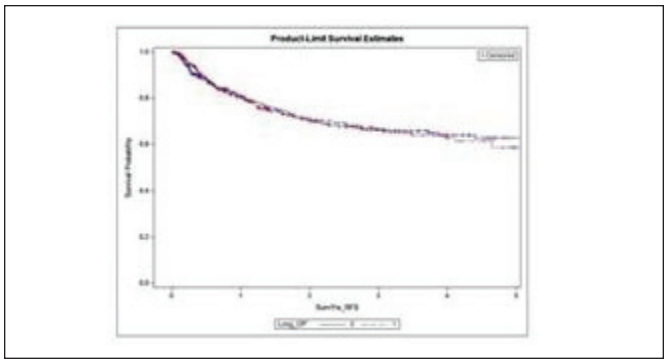
Introduction: We aimed to evaluate the impact of prolonged pneumoperitoneum on recurrence rates after robot-assisted radical cystectomy (RARC).
Methods: A retrospective review of International Robotic Cystectomy Consortium (IRCC) database was performed. Patients who underwent RARC with intracorporeal urinary diversion (ICUD) were identified. Operative time for RARC and ICUD was utilized as a surrogate for insufflation time. Operative time in the first quartile (Q1) was classified as short



Poster #92. Fig. 1.

	Short (Q1)	Prolonged (Q4)	All	P Value
Number of Patients, n (%)	398 (52)	371 (48)	769	0.10
Age, mean (SD)	70 ± 9	65 ± 11	67 ± 11	< 0.01
Sex, Males n (%)	283 (74)	280 (75)	563 (73)	0.56
Body Mass Index, mean (SD) (Kg/m²)	26 (24,30)	28(25,32)	27 (24,31)	< 0.01
Race, Black n (%)	6 (2)	16 (4)	22 (3)	< 0.01
Race, Other n (%)	3 (1)	8 (2)	10 (1)	< 0.01
Race, White n (%)	383 (98)	344 (93)	727 (96)	< 0.01
Operative Time, Hours (IQR)	4 (4-5)	8 (8-9)	5 (4-8)	< 0.01
Recurrence, n (%)	91 (24)	89 (24)	184 (24)	1.00
Local Recurrence, n (%)	45 (11)	43 (9)	88 (10)	0.41
Distant Recurrence, n (%)	64 (16)	72 (19)	136 (18)	0.29
High ASA Score 3 or 4, n (%)	147 (38)	172 (53)	319 (50)	0.08
Charlson Comorbidity Index (IQR)	4 (4,7)	5 (4,8)	5 (4,8)	< 0.01
Received Neoadjuvant Treatment, n (%)	86 (23)	102 (28)	188 (25)	0.11
Prior Radiation Treatment, n (%)	21 (10)	22 (7)	43 (8)	0.42
Prior Abdominal Surgery, n (%)	108 (32)	133 (49)	241 (39)	0.41
Regional Lymph Nodes Postp, n (%)	17 (8)	22 (10)	39 (9)	0.76
Hydronephrosis Preop, n (%)	25 (13)	60 (23)	85 (18)	0.01
Renal Insufficiency Preop, n (%)	20 (8)	29 (10)	49 (9)	0.70
Diversion Approach, Intracorporeal n (%)	368 (100)	371 (100)	769 (100)	
Type of Diversion, Neobladder n (%)	11 (3)	127 (34)	138 (18)	< 0.01
Pathologic Histology, Mixed n (%)	32 (10)	58 (19)	90 (14)	< 0.01
Pathologic Histology, Urothelial n (%)	266 (80)	216 (70)	482 (75)	< 0.01
Pathologic Histology, Variant n (%)	34 (10)	33 (11)	67 (10)	< 0.01
Low Grade, n (%)	5 (1)	8 (3)	13 (2)	0.19
Intermediate Grade, n (%)	10 (3)	14 (5)	24 (4)	0.19
High Grade, n (%)	277 (96)	267 (92)	544 (94)	0.19
Pathologic Tumor Stage (T1), n (%)	71 (22)	63 (20)	134 (21)	0.34
Pathologic Tumor Stage (T2), n (%)	108 (17)	182 (34)	370 (57)	0.34
Pathologic Tumor Stage (T3), n (%)	24 (7)	22 (7)	46 (7)	0.34
Pathologic Tumor Stage (T4), n (%)	12 (4)	15 (5)	27 (4)	0.34
Pathologic Tumor Stage (Tis), n (%)	12 (4)	22 (7)	34 (5)	0.34
Pathologic Tumor Stage (Ta), n (%)	22 (7)	19 (6)	41 (6)	0.34
Lymph Node Yield (IQR)	18 (13,25)	19 (14,28)	19 (14,27)	0.03
Positive Lymph Nodes, n (%)	81 (20)	82 (22)	163 (21)	0.60
Positive Margins, n (%)	21 (6)	28 (8)	49 (7)	0.24
Received Transfusion, n (%)	8 (2)	28 (9)	36 (5)	< 0.01
Estimated Blood Loss ≥100mL (IQR)	2 (0,3.2)	4(2,6)	3 (2,6)	< 0.01
ICU Admission Postop, n (%)	104 (53)	106 (29)	210 (45)	< 0.01
Length of ICU Stay, Days (%)	3 (2,3)	2 (2,4)	3 (2,3)	0.39
Length of Inpatient Stay, Days (%)	8 (6,12)	8 (6,12)	8 (6,12)	0.43
Postop Complications, n (%)	221 (60)	228 (87)	410 (63)	0.00
Postop Complications at 30 days, n (%)	103 (43)	141 (68)	228 (55)	0.26
Postop Complications at 90 days, n (%)	104 (44)	182 (58)	178 (52)	0.06
High Grade Complication Clavien Grade 3+, n (%)	98 (26)	102 (30)	198 (28)	0.21
High Grade Complication in 30 days, n (%)	42 (11)	56 (16)	98 (14)	0.05
High Grade Complication in 90 days, n (%)	61 (16)	78 (23)	139 (19)	0.03
Returned to OR Within 30 Days, n (%)	13 (3)	16 (4)	29 (4)	0.46
Returned to OR Within 48 Hours, n (%)	3 (1)	2 (1)	5 (1)	0.61
Death, n (%)	101 (27)	93 (25)	194 (25)	0.93
Cystectomy Case per Year, mean (SD)	39 ± 10	27 ± 14	32 ± 13	< 0.01
Cystectomy ≤ 2010, n (%)	25 (6)	42 (17)	67 (11)	< 0.01
Cystectomy 2011 – 2015, n (%)	227 (57)	147 (60)	374 (49)	< 0.01
Cystectomy 2016 – 2020, n (%)	146 (37)	102 (44)	308 (40)	< 0.01

Poster #92. Table 1.

pneumoperitoneum and operative time in the fourth quartile (Q4) was classified as prolonged pneumoperitoneum. They were compared in terms of perioperative parameters, recurrence patterns, and survival outcomes. Kaplan-Meier curves were used to depict recurrence-free survival.

Results: A total of 769 patients were identified with 398 (52%) in Q1 and 371 (48%) in Q4 groups. Patients in Q4 exhibited longer median operative time 480 (IQR 480–540) minutes vs. 240 (IQR 240–300) minutes for Q1. Patients in Q4 were younger (65±11 vs. 70±9 years, p<0.01), had higher body mass index 28 (IQR 25–32) vs. 26 (IQR 24–30) (p<0.01), higher lymph node yield 19 (IQR 14–28) vs. 18 (13-25) (p=0.03), received blood transfusion rate more frequently (9% vs. 3%, p<0.01), had more high-grade complications (23% vs. 16%, p=0.03), and had a smaller annual cystectomy volume (27±4 vs. 39±10, p<0.01) compared to Q1 group. There were no significant difference in overall recurrences (24% for both, p=1.00), distant recurrences (19% vs. 16 %, p=0.30), and local recurrences (9% vs. 11%, p=0.40) (Table 1). Both groups exhibited similar recurrence-free survival (log rank p=0.10) (Fig. 1).

Conclusions: Long-term oncological outcome and recurrence-free survival were similar between short and prolonged pneumoperitoneum groups after RARC.

Funding: Roswell Park Alliance Foundation and the Vattikuti Foundation Collective Quality Initiative.

Poster #93

Uretero-enteric strictures after robot assisted radical cystectomy: Prevalence and predictors

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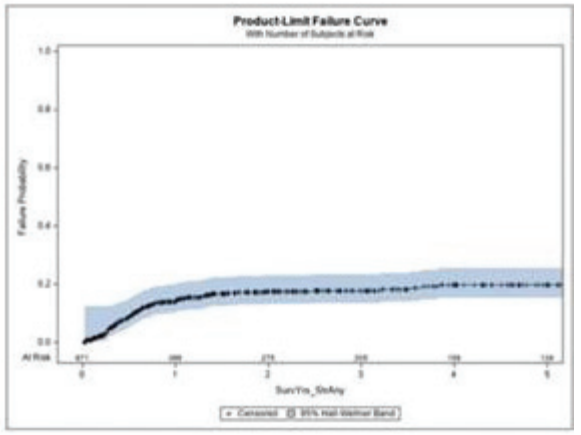
Introduction: Ureteroenteric strictures (UES) are a common cause of reoperations after robot-assisted radical cystectomy (RARC). We sought to evaluate the prevalence, predictors, management and trend over time for strictures after RARC.

Methods: We reviewed our departmental quality assurance database for RARC (2005–2020). Patients who developed UES were identified. Data was analyzed for demographics and perioperative variables. UES were described in terms of timing, laterality, and management. Multivariable analysis was used to identify variables associated with UES. Kaplan-Meir curves were used to depict time to UES.

Results: Out of 671 patients undergoing RARC, 101 (15%) developed UES. They occurred at a rate of 9%, 14%, and 18% at six months, one year, and three years after RARC, respectively (Fig. 1). Strictures were on the right in 31%, on the left in 49 %, and bilateral in 20%. Initial management was endoscopic in 65% and percutaneous in 35%. Eventually, re-implantation was performed in 44% of the patients (open 13% and robotic 31%). Patients with UES had higher body mass index (30±6 vs. 29±6, p=0.03), lower eGFR (ml/min) at 90 days (61 vs. 72, p=0.02), higher rate of acute kidney injury within 90 days (22% vs. 12 %, p=0.01), higher rate of urinary tract infections (UTI) within 90 days (54% vs. 36%, p=0.01) recurrent UTI within 90 days (13% vs. 4 %, p<0.01) (Table 1). Congestive heart failure (OR 2.83, CI 1.12–7.18, p=0.03), and neoad-

	No Stricture	Stricture	All	P Value
Number of Patients, n (%)	570 (85)	101 (15)	671	< 0.01
Age (IQR)	70 (62,76)	69 (63,75)	69 (62,76)	0.76
Sex, Males n (%)	424 (74)	75 (74)	499 (74)	1
Body Mass Index, mean (SD) (Kg/m²)	29± 6	30 ± 6	29 ± 6	0.03
Race, Black n (%)	21 (4)	3 (3)	24 (4)	1
Race, Other n (%)	5 (1)	0 (0)	5 (1)	1
Race, White n (%)	538 (96)	98 (97)	636 (96)	1
Type of Diversion, Neobladder n (%)	51 (9)	12 (12)	63 (9)	0.36
Estimated Blood Loss ≥100mL (IQR)	3 (3,4)	3 (2,5)	3 (3,5,4)	0.64
Operative Time, Hours (IQR)	6 (5,7)	6 (5,7)	6 (5,7)	0.23
Returned to OR Within 30 Days, n (%)	28 (5)	7 (7)	35 (5)	0.46
Histology, Urothelial n (%)	320 (66)	56 (87)	376 (66)	0.43
Histology, Variant n (%)	166 (34)	27 (33)	193 (34)	0.80
High Grade, n (%)	458 (94)	77 (94)	535 (94)	0.67
Pathologic Tumor Stage (T0), n (%)	72 (13)	18 (18)	90 (14)	0.09
Pathologic Tumor Stage (T1), n (%)	77 (14)	12 (12)	89 (13)	0.09
Pathologic Tumor Stage (T2), n (%)	101 (18)	27 (27)	128 (19)	0.09
Pathologic Tumor Stage (T3), n (%)	160 (28)	19 (19)	179 (27)	0.09
Pathologic Tumor Stage (T4), n (%)	76 (14)	8 (8)	84 (13)	0.09
Pathologic Tumor Stage (Tis), n (%)	55 (10)	12 (12)	67 (10)	0.09
Pathologic Tumor Stage (Ta), n (%)	22 (4)	5 (5)	27 (4)	0.09
Positive Lymph Nodes, n (%)	141 (25)	16 (16)	157 (24)	0.06
Positive Margins, n (%)	57 (10)	5 (5)	62 (9)	0.14
Cystectomy ≤ 2010, n (%)	174 (31)	26 (26)	200 (30)	0.38
Cystectomy 2011 – 2015, n (%)	181 (32)	39 (39)	220 (33)	0.38
Cystectomy 2016 – 2020, n (%)	215 (38)	36 (36)	251 (37)	0.38
Postop Complication in 90 days, n (%)	396 (69)	85 (84)	481 (72)	< 0.01
High Grade Complication in 90 days, n (%)	111 (19)	43 (43)	154 (23)	< 0.01
Preop GFR (IQR)	72 (54,86)	74 (62,88)	73 (55,86)	0.08
Postop GFR 90 days (IQR)	72(56,85)	61 (52,79)	70 (55,84)	0.02
Postop AKI, n (%)	68 (12)	22 (22)	90 (13)	0.01
Wound Infection in 90 Days, n (%)	61 (11)	11 (11)	72 (11)	1
Pulmonary Complication in 90 Days, n (%)	48 (8)	12 (12)	60 (9)	0.26
Cardiovascular Complication in 90 Days, n (%)	58 (10)	9 (9)	67 (10)	0.86
GI Complication in 90 Days, n (%)	135 (24)	31 (31)	166 (25)	0.14
GU Complication in 90 Days, n (%)	102 (18)	38 (38)	140 (21)	< 0.01
Thromboembolic Complication in 90 Days, n (%)	24 (4)	8 (8)	32 (5)	0.13
Bleeding in 90 Days, n (%)	11 (2)	2 (2)	13 (2)	1
UTI within 90 Days, n (%)	387 (68)	76 (75)	463 (69)	0.18
Recurrent UTI within 90 Days, n (%)	22 (4)	13 (13)	35 (5)	<0.01

Poster #93. Table 1.



Multivariable analysis for predictors of stricture formation.

	Odds Ratio	95% Confidence Interval	p-value
Congestive Heart Failure	2.834	1.12-7.18	0.03
Neoadjuvant Chemotherapy	1.763	1.12-2.77	0.01

Poster #93. Fig. 1.

juvant chemotherapy (OR 1.76, CI 1.12–2.77, p=0.01) were associated with stricture formation.
Conclusions: UES occurred in 15% of patients after RARC and required reimplantation in almost half of cases. History of congestive heart failure and neoadjuvant chemotherapy were associated with UES.
Funding: Roswell Park Alliance Foundation.

Poster #94

Analysis of complications after robot-assisted radical cystectomy between 2005 and 2020: Results from the International Robotic Cystectomy Consortium

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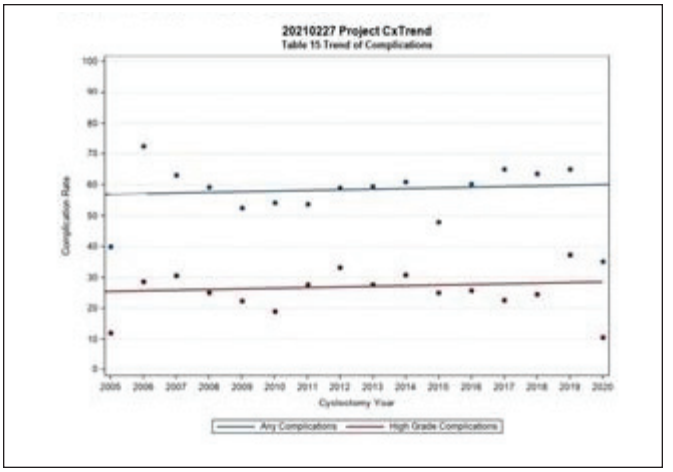
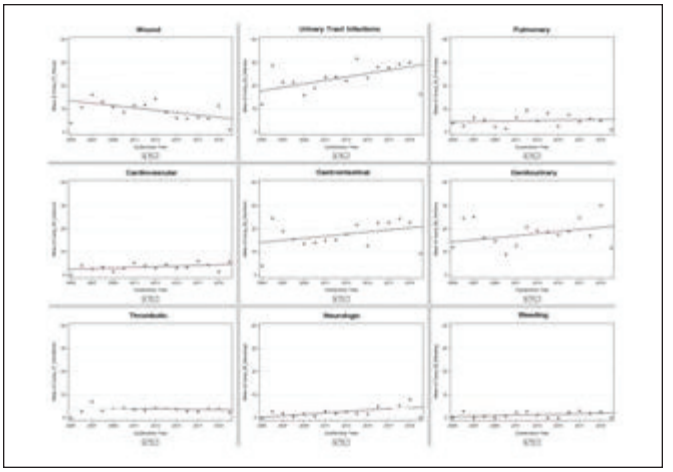
Introduction: We sought to analyze and describe complications after robot-assisted radical cystectomy (RARC).
Methods: A retrospective review of International Robotic Cystectomy Consortium (IRCC) database was performed (2984 patients, 27 institutions from 14 countries). Postoperative complications were categorized as high grade if ≥ Clavien Dindo III and were grouped based on the anatomical



Poster #94. Fig. 1.



Poster #94. Fig. 2.

site. Multivariable analysis was used to elicit variables associated with high grade complications. Cochran-Armitage trend test was used to depict change in complications over time.
Results: A total of 1600 (57%) developed postoperative complications. Of these, 460 (17%) had high grade complications. Urinary tract infections were the most common overall complication (659, 24%). The incidence of overall complications and high-grade complications remained stable between 2005 and 2020 (p>0.05) (Fig. 1). Wound-related complications decreased from 13% to 7% (p<0.01), while UTIs increased from 18% to 29% (p<0.01), GI complications from 14% to 21% (p=0.02) and GU complications from 14% to 21% (p=0.02) (Fig. 2). On multivariable analysis, BMI (OR 1.03, 95% CI 1.01–1.05, p<0.01), previous abdominal surgery (OR 1.27, 95% CI 1.02–1.60, p=0.04), neobladders (OR 1.46, 95% CI 1.09–1.95, p=0.01), diabetes with end organ damage (OR 1.97, 95% CI 1.28–3.02, p<0.01), longer inpatient stay (OR 1.03, 95% CI 1.02–1.04, p <0.01), and longer ICU stay (OR 1.72, 95% CI 1.37–2.16, p<0.01) were associated with high grade complications.
Conclusions: While overall complications after RARC remained stable, UTIs, GI and GU complications have increased significantly between 2005 and 2020. Previous abdominal surgery, neobladders, and diabetes were associated with high grade complications.
Funding: Roswell Park Alliance Foundation.

Poster #95

A propensity matched comparison of percutaneous ablation therapy to partial nephrectomy for cT1a renal malignancies: Results from the Canadian Kidney Cancer Information System (CKCis)

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Introduction: Percutaneous ablation therapy (AT; radiofrequency ablation and cryoablation), and partial nephrectomy (PN) are accepted treatments for T1a kidney cancer. Given high recurrence-free (RFS) and overall survival (OS) with both for T1a kidney cancer, the question that remains unanswered is should AT be offered to a broader patient population. Our objective was to determine if AT is comparable to PN with respect to RFS and OS after accounting for confounding variables using advanced statistical methodology.

Methods: Patients treated with AT or PN for cT1aN0M0 kidney cancer from 2011–2020 were identified from CKCis. Primary outcomes included RFS and OS. Baseline patient and tumor characteristics were balanced using five methods of propensity score (PS) analysis. RFS and OS were estimated using the Kaplan-Meier method. Cox proportional hazards regression was used to evaluate outcomes of each treatment.

Results: Included in the PS analysis were AT (n=214) and PN (n=1,643) with a median followup of 1.9 years (interquartile range [IQR] 0.5–4 years). Covariates (mean ± standard deviation) were well balanced following PS matching between the AT and PN cohorts: age (63.5±9.6 vs. 62.8±9.5 years, p=0.53), Charlson comorbidity index (4.7±1.4 vs. 4.6±1.6, p=0.72), and tumor size on imaging (2.6±0.8 vs. 2.6±0.8 cm, p=0.74). At the last followup visit, 10 and 52 patients experienced recurrence, whereas 12 and 38 had died in the AT and PN cohorts, respectively. Five-year RFS in the PS matched cohort for patients undergoing AT in comparison to PN was 93.6% (IQR 79.0–98.2) and 92.8% (IQR 83.3–95.9), while five-year OS was 90.4% (IQR 74.8–95.6) and 94.9% (IQR 89.7–97.5), respectively. There were no significant differences in RFS (Fig. 1A) (hazard ratio [HR] 1.06, 95% CI 0.33–3.44, p=0.92) or OS (Fig. 1B) (HR 0.44, 95% CI 0.13–1.51, p=0.19) between AT and PN.

Conclusions: No statistically significant difference was identified in outcomes following AT in comparison to PN in patients with cT1aN0M0 kidney cancer. As previously shown, the hazard ratio in the PS matched cohort suggests that there is potentially a difference in OS favoring PN, however our findings indicate that this may be due to insurmountable selection bias, warranting the need for higher-level evidence.

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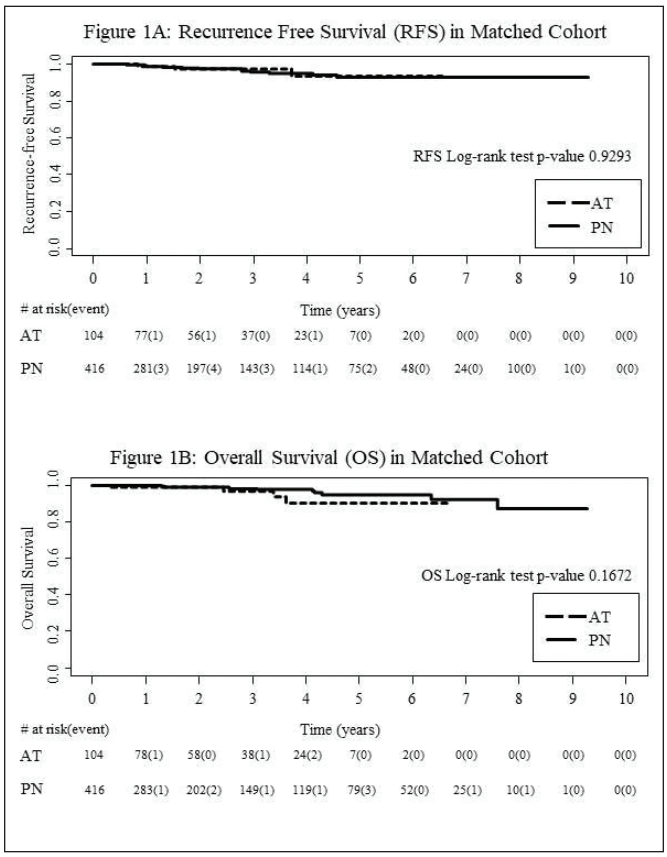

Poster #95. Fig. 1. (A) RFS in matched cohort. ***(B)*** OS in matched cohort.

Poster #96

Adrenal pheochromocytoma: Tumor histology correlates with perioperative intensive care stay

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Introduction: Pheochromocytomas (PCC) are catecholamine secreting tumors of the sympathoadrenal system, with the majority arising in the chromaffin cells of the adrenal medulla. The biologic behavior of these tumors is a challenge to predict on the basis of tumor histology. Malignant PCC, for example, is only confirmed in the presence of metastatic disease at non-chromaffin sites. Pheochromocytoma of the Adrenal Gland Scale Score (PASS) is an adjunctive pathologic assessment that helps identify tumors at greater risk of metastatic spread. However, the value of PASS in assessing clinical outcomes apart from metastatic disease is unknown. In our study, we aimed to assess the relationship between the tumor histology (PASS) and clinical severity of surgically resected adrenal PCC.

Methods: We performed a retrospective chart review on all resected pheochromocytomas in a tertiary institution from 2008–2018. Pathology slides were reviewed and all specimens were assigned a PASS score. Demographic information and clinical outcomes were collected for all resected PCC during the study period. Spearman correlation coefficients were used for comparison of continuous variables.

Results: A total of 63 tumors were identified. Two cases were deemed to be malignant pheochromocytoma and the remainder benign. There was no clear relationship between PASS score and patient age, history of hypertension, cardiac presentation, metanephrine level, peak intraoperative blood pressure, or length of hospital stay. There was a trend toward higher PASS in patients with symptoms at presentation but this difference did not reach statistical significance (6 vs. 4, p=0.4729). Median PASS was higher in females than males (6 vs. 2, p=0.0173). Patients requiring

perioperative ICU admission had tumors with higher PASS than patients who did not require critical care (8 vs. 5, p=0.04).
Conclusions: This is the first study to use the pheochromocytoma of the adrenal gland scaled score to assess patient outcomes beyond metastatic disease. While metastatic disease is devastating, the more common danger from PCC is directly related to the clinical sequelae of catecholamine excess. We report a novel application of the PASS to confirm a relationship between tumor histology and perioperative outcome in pheochromocytoma patients treated with adrenalectomy. While this preliminary work is hypothesis-generating, further studies with larger sample sizes are needed.

Poster #97

Assessing the utility of postoperative kidney, ureter bladder X-rays to evaluate nephroureteral stent position in robotic-assisted cystectomy

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Introduction: Postoperative kidney, ureter, bladder (KUB) X-rays are commonly used to evaluate nephroureteral stent position in the setting of robotic-assisted radical cystectomy (RARC). The utility of routinely obtaining this imaging study postoperatively to confirm proper stent location and guide clinical decision-making has not been well-established.
Methods: This study identified 308 patients who underwent RARC between January 2011 and September 2020 at a tertiary care institution where KUB-X-rays are routinely included in postoperative care. Demographic and clinical data were obtained through retrospective, systematic review of electronic medical records. Recorded variables included presence of stent displacement, interventions performed based on stent displacement, nephroureteral stent(s) removal dates, ureteral stricture formation, and complication rates.
Results: Among the 308 patients who underwent RARC, 238 (76.5%) were male with an average age of 68 years. In this population, 279 (90%) of patients underwent RARC for bladder malignancy, 13 (4%) for prostate malignancy, 10 (3%) for neurogenic bladder, and 10 (3%) for other causes including refractory lower urinary tract symptom management and/or pelvic trauma. The majority of patients (281; 91%) underwent illeal conduit urinary diversion; the remaining patients had neobladder creation (16, 5.1%) or cutaneous ureterostomy (13, 4.2%). All but two patients received KUB X-rays postoperatively to evaluate nephroureteral stent position. In 31 (10.1%) patients, KUB X-rays demonstrated that the stents were slightly displaced distally within the ureter, a deviation from the expected position within the renal pelvis. With the exception of two patients, all stents were positioned across the anastomosis, and no repositioning interventions were performed as a result of any KUB findings. Stent displacement was not associated with developing urinary tract infections, bacteremia, urine leakage around the ureteroilleal anastomosis, acute kidney injury, or 30-day re-admission rates (p=0.819, 0.537, 0.086, 0.607, and 0.910, respectively). No correlation was found between stricture formation and stent displacement (p=0.614), having undergone abdominopelvic radiation (p=0.449), or total number of days stent were kept in place (p=0.353).
Conclusions: Although obtaining post-RARCs KUB X-rays is a common practice among urologists, stent displacement does not lead to repositioning interventions, postoperative complications, or ureteral stricture formation. The information acquired from postoperative KUBs has limited utility as a clinical decision-making tool in nephrourteral stent management. Furthermore, these data suggest that KUB X-rays are not necessary unless clinically indicated. Additionally, obtaining imaging studies routinely adds to increasing healthcare costs and radiation exposure for oncology patients.

Poster #98

Protein disulfide isomerase as a biomarker for non-muscle-invasive bladder cancer recurrence

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Introduction: Owing to its high recurrence rate and tumor multifocality, non-muscle-invasive bladder cancer (NMIBC) poses challenges in clinical management and is one of the costliest cancers to treat. Recently, we found that persistent unfolded protein response of endoplasmic reticulum (UPR-ER) induced by BC-derived extracellular vesicles (EVs) drives bladder tumorigenesis. Protein disulfide isomerase (PDI) is an abundant ER-resident protein that protects rapidly dividing cells from ER stress and is overexpressed in many cancers. However, because NADPH oxidase activity leads to the generation of reactive oxygen species and cell death, the use of PDI inhibitors to target cancers remains controversial. Here, we aim to determine whether PDI expression and subcellular localization patterns in patient tumors predict NMIBC recurrence.
Methods: The Human Genome Atlas (TCGA) was used to assess PDI expression and survival. PDI functional roles in BC cells were examined using loss-of-function approaches. A retrospective chart review identified patients with low-grade NMIBC which was classified as recurrent (n=11) or non-recurrent (n=12) after initial transurethral resection of bladder tumor (TURBT) during the followup period. Formalin-fixed tissues were obtained from each patient's initial TURBT and immunofluorescent staining of TURBT tissues was conducted with antibodies against PDI, BiP (a marker for ER stress), and CD63 (an EV marker). Within tumor regions, staining intensity and epitope colocalization were measured using ImageJ/Fiji.
Results: Analysis of the TCGA data revealed that PDI is overexpressed in BC and is inversely correlated with patient survival. PDI knockdown in cancer cells increased resistance to ER stress-induced apoptosis. Patient tumors that recurred after TURBT exhibited a 1.48-fold higher PDI expression as compared to nonrecurrent tumors (p<0.048). Intriguingly, a fraction of the PDI signal colocalized with the EV marker. This pilot result was used in a power analysis to determine the sample size required to confirm these observations, and a tissue microarray with 104 recurrent and non-recurrent NMIBC patients is under construction.
Conclusions: This study demonstrates that PDI may be a biomarker of BC recurrence. Ongoing work will elucidate whether the dynamic exchange of PDI redox status in BC cells and its relation to PDI cellular localization also has significance for BC recurrence and progression.
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Poster #99

Cost-effectiveness analysis of post-orchiectomy management of clinical stage I non-seminoma germ cell testicular cancer

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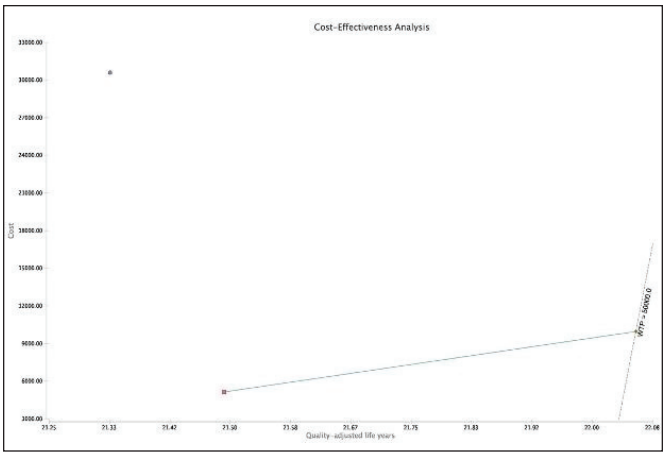
Introduction: The optimal management following initial orchiectomy of testicular cancer patients with clinical stage (CS) I non-seminomatous germ cell tumor (NSGCT) is controversial. There is a survival equipoise between retroperitoneal lymph node dissection (RPLND), primary chemotherapy, and surveillance following initial orchiectomy. Considering that differences in survival outcomes are marginal, we performed a cost-effectiveness analysis to elucidate the tradeoffs and expected values for each management option.
Methods: We developed a Markov cohort simulation model that projected overall survival (OS), cancer-specific survival (CSS), quality-adjusted life years (QALYs), and healthcare cost from the payer's perspective with a lifetime time horizon for a cohort of 33-year-old CS1 NSGCT patients.



Poster #99. Fig. 1. Cost-effectiveness analysis with willingness-to-pay (WTP) threshold set at $50 000.

Disease history, characteristics of relapses, relapse treatment algorithms, and utility values were derived from a comprehensive review of the literature and expert opinion. Costs were determined based on the Premier Hospital Database, a national hospital discharge database representing 20% of hospitals in the United States. The model was calibrated and validated against existing literature. A willingness-to-pay (WTP) threshold of $50 000 per QALY was employed.

Results: In the base case, surveillance was associated with the highest OS, CSS, and QALYs. It was associated with a 94.7% 15-year OS, a 98.6% 15-year CSS, and 22.06 QALYs. RPLND was more costly and less effective than both surveillance and primary chemotherapy. The incremental cost-effectiveness ratio associated with surveillance, as compared to primary chemotherapy, was $1410 per QALY gained, which is well below the WTP threshold. Results of the cost-effectiveness analysis are summarized in Fig. 1.

Conclusions: We found that surveillance for CS1 NSGCT patients is the optimal strategy compared to RPLND and primary chemotherapy. These findings can inform clinical decision-making, as well as resource allocation.

Poster #100

Neoadjuvant chemotherapy use for bladder cancer treated at the Saint John Regional Hospital

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Introduction: Neoadjuvant chemotherapy is considered the standard of care for patients with muscle-invasive bladder cancer undergoing cystectomy. We conducted a local retrospective review of all patients who underwent radical cystectomy to assess factors associated with neoadjuvant chemotherapy use.

Methods: A retrospective review was completed for patients (n=102) with urothelial carcinoma treated at the Saint John Regional Hospital by radical cystectomy from January 1, 2008 to December 31, 2019. Guided by literature review, data collected focused on patient factors, treatment regimens, and survival outcomes of those meeting inclusion criteria. Descriptive and between-group statistical analyses were performed to analyze the data for comparison between those who underwent neoadjuvant chemotherapy, and those who did not, prior to radical cystectomy.

Results: A total of 63 patients underwent cystectomy alone, while 39 patients received neoadjuvant chemotherapy before cystectomy. The average age at diagnosis for the cystectomy cohort was 71.4 years, whereas for the neoadjuvant chemotherapy cohort was 66.7 years. Almost three-quarters of patients were male (71.6%). Most patients (78.2%) had a history of smoking. Almost all patients had transitional cell carcinoma on histology (92.2%). Approximately a third (28.2%) of the neoadjuvant chemotherapy cohort established a complete response following cystectomy. Median overall survival consisted of 19.9 months in the cystectomy alone group, whereas the treatment group undergoing neoadjuvant chemotherapy consisted of 34.9 months. Between treatment modalities, a significantly greater proportion of patients from the neoadjuvant chemotherapy cohort had stage 2 disease compared to the cystectomy alone cohort (66.7% vs. 31.7%).

Conclusions: Considering the high incidence and mortality of bladder carcinoma, an assessment of local uptake of neoadjuvant chemotherapy preceding radical cystectomy for muscle-invasive bladder cancer was completed. The neoadjuvant chemotherapy cohort experienced prolonged overall survival based on descriptive statistics, with several patients meeting a complete response following cystectomy. Between-group analyses revealed neoadjuvant chemotherapy patients to have a significantly higher initial stage 2 disease than those treated by cystectomy alone. This review will inform treatment decisions and referral patterns at a local level, as well as contribute to future research regarding bladder cancer outcomes.

Poster #101

Effects of patient gender on decision-making regarding treatment of a localized renal mass

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Introduction: Gender disparity in the proportion of patients receiving nephron-sparing strategies (NSS) for the treatment of localized renal masses has been demonstrated in multiple populations including large, population-based cancer databases, as well as single centers of excellence. Reasons for the discrepancy remain elusive. We aimed to describe factors affecting treatment decisions on a patient level and gender-specific differences.

Methods: Patients eligible for NSS for treatment of a localized renal mass (solitary renal mass ≤7 cm with normal other kidney and renal function) at one academic center were asked to complete a survey regarding the factors affecting choices for type of treatment. Variations in responses were investigated between the genders using Fisher's exact test.

Results: Of the 79 patients that completed the survey, mean age was 60 and most were white, catholic, married, former smokers. Most patients were male (65%). There were no differences in race, religion or marital status between genders. Men were more likely to have a more significant smoking history than women. Men were offered open partial nephrectomy more often than women (47 vs. 18%, p=0.014). Otherwise, there were no differences between genders in what treatments they felt were offered, likelihood of renal mass malignancy, or the likelihood treatment would be curative. Women more often felt religious beliefs were very or extremely important in influencing their treatment choices (27 vs. 2%, p=0.002). Advice from the doctor tended also to be more important to women (p=0.055), as was the chance of treatment being curative (p=0.029). However, there was no difference in perceived chance of treatment efficacy with both genders believing there was a >80% chance of cure (p=0.933). No differences in importance of influence were seen with advice from family or friends, risks of treatment side effects, recovery time, required time off from work or activities, pain after surgery, or appearance of scars.

Conclusions: With only slight differences felt between genders in types of treatment offered, women were more likely to cite religion, chance of cure and doctor's advice as the most important influences on choice of treatment for a localized renal mass

Poster #102

Prehabilitation body mass index (BMI) target for complication risk reduction following radical cystectomy

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Introduction: Surgical morbidity after radical cystectomy (RC) is significant, particularly in patients with an elevated body mass index (BMI). Prehabilitation is a multimodal, preoperative optimization program with nutritional optimization and weight loss as core principles, reported to reduce complications after major cancer surgery. Weight-loss-focused prehabilitation may apply to patients with an-above normal BMI with a sufficient preoperative intervention window, such as a period of neoadjuvant chemotherapy. Our study objectives are to compare complication rates between BMI categories and identify BMI groups most at risk from surgical morbidity, who may benefit from weight-loss-focused prehabilitation to modify their risk of perioperative morbidity.

Methods: Data were extracted from the Canadian Bladder Cancer Information System, a prospective Canadian registry across 13 academic centers. A retrospective analysis was performed on 589 patients who underwent RC. Perioperative (≤90 days) complications were classified by type and severity according to the Clavien-Dindo classification (CDC), where available. Unconditional Logistic regression analysis was performed to determine the association between BMI group and complication risk.

Results: The median BMI of the cohort was 27 (IQR 7), with 29% classified as having normal BMI (<25 kg/m^2), 38% overweight (25–29 kg/m^2), 21% class I (30–35 kg/m^2), and 12% ≥class II (>35 kg/m^2) obesity. The overall complication rate was 39.6%. Intraoperative blood loss and length of hospital stay were significantly elevated in all above-normal BMI groups. Ileus wound infection and urine leak were the most commonly detected postoperative complications (Table 1). Overweight BMI was independently associated with any complication (OR 1.96, p=0.004) and urine leak (OR 5.22, p=0.034) on multivariable analysis. Obesity ≥ class II was associated with any complication (OR 3.49, p<0.0001), wound infection (OR 6.31, p<0.0001), fascial dehiscence (OR 5.57, p=0.027), and urine leak (OR 5.69, p=0.044). Class 1 obesity was not significantly associated with complications (OR 1.38, p=0.259).

0-90 Day complications	Total	Normal BMI (<25)	Overweight (25-29)	Class I Obesity (30-35)	≥ Class II obesity (>35)	p-Value
Patients	589	168 (28.5)	225 (38.2)	125 (21.2)	71 (12.1)	
Any complication, (%)	233 (39.6)	51 (30.4)	97 (43.1)	44 (35.2)	41 (57.7)	<0.0001
Minor complications (Grade 1-2)	79	21 (26.6)	31 (41.3)	14 (17.7)	13 (16.5)	0.554
Major complications (Grade 3-5)	57	9 (15.8)	29 (50.9)	8 (14)	11 (19.3)	0.015
Ileus	71	17 (23.9)	33 (47.9)	10 (14.1)	10 (14.1)	0.188
Wound infection	48	6(12.5)	17 (35.2)	10 (20.8)	15 (31.3)	<0.0001
Urine leak	30	4 (13.3)	15 (48.4)	6 (20.0)	5 (16.7)	0.232
EBL (mls), mean [SD]	732.1 (623.3	602.9 (501.8)	734.5 (703.6)	841.9 (605.0)	837.3 (605.3)	0.0077
LOS (d), median [IQR]	12.6 (15.5)	10.2 (9.0)	13.2 (16.6)	11.9 (11.5)	17.4 (25.9)	0.0093

BMI: body mass index, EBL: estimated blood loss, LOS: length of hospital stay, IQR: inter-quartile range

Poster #102. Table 1.

Conclusions: This study demonstrates the feasibility of using a national bladder cancer database to record and evaluate RC complications. Overweight and class II obesity BMI groups were most at risk from perioperative morbidity. These groups may benefit from targeted weight-loss intervention during prehabilitation, where feasible, to reduce their risk of surgical morbidity from RC.

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Poster #104

Renal mass biopsy diagnostic outcomes and complications: A single-institution experience

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Introduction: Renal mass biopsies (RMB) are controversial due to concerns about non-diagnostic rates, false-negatives, false-positives, risk of complications, and risk of inaccurate pathologic diagnosis. We sought to understand the patient, tumor, and technical factors that influence RMB diagnostic accuracy and complications.

Methods: RMB over five years (April 1, 2014 to June 30, 2019) at Albany Medical Center were retrospectively reviewed for demographic, pathological, and clinical factors to determine the diagnostic accuracy, complication rates, and demographic/technical aspects that may influence accuracy and complications.

Results: There were a total of 301 renal mass biopsies during the study period. The mean age at biopsy was 63, 62.8% were male, 87% were white, and the mean BMI was 31.9. Solid masses constituted 92.4% of tumors, with a mean size at biopsy of 34 mm (IQR 22–39). Nephrometry scores were: 41% low, 43.7% moderate, and 15.3% high. Biopsies were conducted primarily by two providers (76%) with a diagnostic rate of 87.8% compared to 86.1% for low-volume providers. Core specimens were most common (95%), with a mean number of 8.4 cores. 20G needles were most commonly (89.4%) used. A CT-guided approach was preferred (96.7%), and of those, 92.8% were non-contrast. Of diagnostic specimens, 19% were benign masses — AML, inflammatory/infectious, oncocytomas — and grade was reported in 54.3% of samples. Post-biopsy management included surgery (37.2%), cryoablation (18.9%), surveillance (17.6%), oncologic referral (10.6%), other (6.7%), and unknown (9%). Surgical specimens (n=110) were 88.2% concordant with biopsy pathology and 51.9% for grade. While there was a 20.3% total complication rate with hematomas being most common (55.7%), the rate of clinically relevant complications was 11%. Patient characteristics (age, gender, race), tumor factors (RENAL nephrometry score, size, laterality and pre-procedure imaging), procedural factors (US vs. CT guided, needle size, use of contrast, provider, number of cores) did not influence diagnostic/complication rates. Cystic tumors were more likely to yield non-diagnostic biopsies (OR 13.15, 95% CI 5.23–33.05). Core biopsies alone were less likely to yield non-diagnostic biopsies compared to both core/FNA OR 0.17 (95% CI 0.05–0.57). Obese patients were less likely to have complications compared to morbidly obese patients (OR 0.37, 95% CI 0.16–0.84).

Conclusions: AMC renal mass biopsies have a similar non-diagnostic rate and a slightly higher complication rate compared to that reported in the literature. Few factors predict diagnostic and complication rates. Providers should be wary of performing biopsy on cystic lesions and should advise morbidly obese patients about their higher rates of complications.

Poster #105

Partial vs. radical nephrectomy: Comparison of postoperative complications

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Introduction: Partial nephrectomy has become increasingly performed by urologists due to the potential benefit of minimizing progression to chronic kidney disease or exacerbation thereof. We aimed to compare the incidence of complications following radical nephrectomy and partial nephrectomy performed for localized renal cell carcinoma (RCC).

Methods: The ACS National Surgical Quality Improvement Program (NSQIP) database was used to extract data for patients who underwent radical or partial nephrectomy for localized kidney cancer between 2005 and 2017. We examined the 22 available complications reported by NSQIP that occurred within a period of 30 days postoperatively. To limit analysis, only subjects carrying ICD-code diagnoses of RCC were included. Exclusion criteria included patients on dialysis, those with distant metastases, and those with CPT codes implying concurrent procedures (LN dissection and vascular procedures being the most common). For each complication, the incidence in each group was first compared using Fisher's two-sided exact test or Pearson's Chi-squared test, as appropriate. For complications that differed significantly between groups on univariate analyses, multivariable analyses were performed using logistic regression models and adjusting for preoperative co-morbidities. Null hypotheses were rejected when p-values were <0.05.

Results: After applying inclusion and exclusion criteria, a cohort of 21 653 subjects remained: 19 000 in the radical nephrectomy group and 2653 in the partial nephrectomy group. On univariate and multivariable analyses, seven of 20 complications were more likely to occur following partial nephrectomy than radical nephrectomy. Specifically on multivariable analysis, abdominal abscess (OR 3.06 [2.00–4.67], p<0.001), pneumonia (OR 1.82 [1.32–2.52], p<0.001), progressive renal insufficiency (OR 1.64 [1.11–2.42], p=0.013), urinary tract infection (OR 1.61 [1.18–2.19], p=0.002), bleeding requiring transfusion (OR 1.40 [1.21–1.62], p<0.001), sepsis (OR 2.46 [1.62–3.73], p<0.001), and return to the operating room (OR 2.56 [2.04–3.22], p<0.001) were more likely with partial nephrectomy (Table 1). Of note, postoperative 30-day mortality did not differ between the two groups.

Conclusions: Patients who are candidates for both radical and partial nephrectomy should be counseled on the increased risk of perioperative complications following partial nephrectomy, and these risks should be weighed against the benefit of preserving renal parenchyma during shared decision-making.

Complication	Radical Nephrectomy (n = 19,000)	Partial Nephrectomy (n = 2,653)	Univariate Odds Ratio (CI)	p-value	Multivariable Odds Ratio (CI)	p-value
Abdominal Abscess	79 (0.4%)	35 (1.3%)	3.20 (2.15 - 4.78)	<0.001	3.06 (2.00 - 4.67)	<0.001
Pneumonia	226 (1.2%)	49 (1.8%)	1.56 (1.15 - 2.14)	0.006	1.82 (1.32 - 2.52)	<0.001
Progressive Renal Insufficiency	147 (0.8%)	33 (1.2%)	1.62 (1.10 - 2.36)	0.013	1.64 (1.11 - 2.42)	0.013
Urinary Tract Infection	269 (1.4%)	52 (2.0%)	1.39 (1.03 - 1.88)	0.030	1.61 (1.18 - 2.19)	0.002
Bleeding Requiring Transfusion	1455 (7.7%)	254 (9.6%)	1.28 (1.11 - 1.47)	<0.001	1.40 (1.21 - 1.62)	<0.001
Systemic Sepsis	97 (0.5%)	32 (1.2%)	2.38 (1.59 - 3.56)	<0.001	2.46 (1.62 - 3.73)	<0.001
Return to Operating Room	324 (1.7%)	108 (4.1%)	2.45 (1.96 - 3.05)	<0.001	2.56 (2.04 - 3.22)	<0.001
30-day Mortality	84 (0.4%)	13 (0.5%	1.11 (0.62 - 1.99)	0.755	1.42 (0.76 - 2.63)	0.272

Poster #105. Table 1. Univariate and multivariable analysis of postoperative complications.

Poster #106

Disparities in hospital admissions for nephrectomy related to renal cancer

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Introduction: Partial or radical nephrectomy are the surgical treatment options for renal cell cancer (RCC), and is typically performed as a planned, elective procedure. However, some nephrectomy procedures are performed on an urgent or emergency basis. This study aims to evaluate hospital admissions that required partial or radical nephrectomy for RCC and identify factors that are associated with non-elective nephrectomies in New York State.

Methods: We used NY Statewide Planning and Research Cooperative System dataset for hospital inpatient discharges for 2013-2017 calendar years. CCS Diagnosis code for RCC and CCS Procedure codes for nephrectomy were used to extract the data. Hospital admissions were further classified based on type of visit codes as emergency, urgent, and elective. Multivariate logistic regression was used to identify factors of emergency and urgent admissions that required partial or radical nephrectomy for RCC.

Results: During the 2013–2017 period, there were 13 893 hospital admissions that required partial or radical nephrectomy for RCC in the New York State. Majority of nephrectomy cases were elective admissions (91.8%, n=12 757/13 893). However, 5.9% (n=826/13 893) were emergency admissions and 2.2% (n=310/13 893) were urgent admissions. Compared to elective admissions, emergency admissions were associated with 18 or younger age group (OR 5.518, p<0.001), African American race (OR 2.278, p<0.001), other race (OR 1.888, p<0.001), Hispanic ethnicity (OR 1.622, p<0.001), and Medicaid insurance (OR 2.582, p<0.001). Teaching hospitals were associated with higher number of emergency admissions (OR 2.156, p<0.001). Age of 70 and above relative to the 30–49 age group and non-disclosed ethnicity were associated with fewer emergency admissions (OR 0.671, p=0.006; and OR 0.556, p<0.001, respectively). Urgent admissions were associated with 18 or younger age group (OR 8.368, p<0.001) and non-disclosed ethnicity (OR 2.160, p=0.005). Private insur-

	Urgent			Emergency		
	Odds Ratio	*95% CI*	*p Value*	*Odds Ratio*	*95% CI*	*p Value*
Age Group						
70 or Older		Reference			Reference	
50 to 69	1.054	0.775-1.434	0.74	0.769	0.626-0.945	0.12
30 to 49	1.009	0.640-1.591	0.97	0.671	0.506-0.890	**0.006**
18 to 29	1.608	0.560-4.619	0.38	1.047	0.548-2.002	0.9
0 to 17	8.368	4.574-15.312	**<0.001**	5.518	3.697-8.236	**<0.001**
Race						
White		Reference			Reference	
African American	0.66	0.425-1.026	0.065	2.278	1.865-2.784	**<0.001**
Multi-racial	1.357	0.316-5.828	0.68	2.471	0.999-6.109	0.05
Other	1.162	0.853-1.584	0.34	1.888	1.564-2.280	**<0.001**
Ethnicity						
Non-Spanish/Hispanic		Reference			Reference	
Spanish/Hispanic	1.146	0.746-1.760	0.54	1.622	1.297-2.029	**<0.001**
Unknown	2.16	1.264-3.689	**0.005**	0.556	0.310-0.998	**0.049**
Payor						
Medicare		Reference			Reference	
Medicaid	1.229	0.844-1.788	0.28	2.582	2.061-3.235	**<0.001**
BCBS	0.71	0.494-1.020	0.064	0.846	0.652-1.098	0.21
Private Insurance	0.569	0.388-0.835	**0.004**	1.011	0.794-1.287	0.93
Other				1.132	0.780-1.644	0.51
Hospital Classification						
Teaching Hospital	0.988	0.639-1.526	0.97	2.156	1.435-3.240	**<0.001**

Poster #106. Table 1. Multivariate logistic regression model of patients presenting for urgent and emergency nephrectomy.

ance and other payment source, such as Government, VA, Department of Correction, and self-pay were associated with fewer number of urgent admissions that required nephrectomy for RCC (OR 0.569, p=0.004; and OR 0.431, p=0.018, respectively).
Conclusions: Patients who undergo emergency nephrectomies are more likely to be young, African American, Hispanic, carry Medicaid insurance, and present to the teaching hospital. Investigating the factors associated with patient populations prone to urgent and emergent nephrectomies has demonstrated disparity in care for RCC.

Poster #107

The prognostic value of urinary cytology after trimodal therapy for muscle-invasive bladder cancer

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Introduction: Complete response after trimodal therapy (TMT) for muscle-invasive bladder cancer (MIBC) is generally defined as negative urine cytology, no visible tumor, and negative biopsies at cystoscopy. However, the significance of positive urinary cytology after TMT in the absence of lesions in the upper tract or intravesical clinical or pathological recurrence remains unknown. Altered cytology post-TMT may represent MIBC recurrence, treatment effects or may be a marker of de novo urothelial lesions. Herein, we investigate the rates and temporal trends of positive cytology post-TMT to determine its potential value as a prognostic marker for bladder cancer recurrence post-TMT.
Methods: We conducted a retrospective analysis of 150 patients who underwent TMT for MIBC at a single academic institution from 2002–2017. Cytology results (negative vs. positive/equivocal) after TMT completion were evaluated for association with disease recurrence rates (RFS) where available (n=128). Time-to-recurrence, stratified by cytology result at first followup post-TMT, and time-to-negative cytology were assessed by the Kaplan-Meier method and differences between groups ascertained with the log-rank test.
Results: We observed 61 recurrence events in 128 patients with a median followup period of 3.6 years (range 0.3–14.2): 13 (21%) local, 11 (18%) urinary tract, 13 (21%) metastasis, and 24 (39%) other/combination). Cytology was positive at first followup post-TMT in 41 (32%) patients, and negative cytology was achieved in 115 (90%) at any point during followup. Median recurrence-free survival (RFS) was significantly shorter in those with positive (PC) vs. negative cytology (NC) at first followup post-TMT (21.3 vs. 78.1 months respectively, p=0.047), corresponding with an apparent increase in the cumulative recurrence rate at 3.3 years (PC: n=24 [60%] vs. NC: n=37 [42%], p=0.085). In patients with persistent PC (positive at ≥4 months post-TMT, n=33[22%]), the median time-to-NC was 3.22 months (95% CI 2.99–5.80). A longer time-to-NC was associated with the cumulative incidence of recurrence of 3.68 months (95% CI 3.22–8.96) in those with recurrence vs. 2.76 months (95% CI 0.69–2.99) in those without recurrence.
Conclusions: The development of negative cytology, and a shorter interval to its occurrence (e.g., <3 months) after TMT, is associated with improved RFS and potentially with lower rates of recurrence overall. Collaborative efforts seem warranted to better define the role of post-TMT cytology as a readily available and inexpensive biomarker to guide survivorship and salvage protocols.

Poster #108

Sex differences among those with bladder cancer post-cystectomy: A retrospective, population-based study

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Introduction: Current dogma would suggest differential outcomes for women with bladder cancer post-cystectomy, although the evidence is ambiguous.
Methods: The purpose of this research is to determine whether there is a difference in early or late outcomes between males and females among those who underwent radical cystectomy for bladder cancer. This retrospective, population-based study reports on all patients that underwent radical cystectomy in Ontario using electronic records of treatment recorded in the ICES database. The primary outcome is to determine if both overall and cancer-specific survival differed between males and females among those who needed radical cystectomy upon initial presentation or those who progressed to needing radical cystectomy. Secondary outcomes include early postoperative mortality and re-admission rates. We used a Cox proportional-hazards regression model to adjust for known confounders.
Results: There were 645 males and 248 females who underwent cystectomy for BC de novo and 538 males and 142 females were progressors. Analysis of these cases revealed that there were no sex differences in either overall survival (HR 1.16, 0.98–1.38) or cancer-specific survival (HR 1.14, 0.95–1.38) among those who present with MIBC de novo. Similarly, there were no sex differences among those who progressed to cystectomy in both overall survival (HR 1.02, 0.80–1.29) and cancer-specific survival (HR 1.06, 0.81–1.39). Additionally, there were no sex differences in mortality at both 30 days (HR 0.62, 0.28–1.36) and 90 days (HR 1.23, 0.81–1.86) postoperative. There were also no sex differences in readmission at both 30 days (HR 0.87, 0.67–1.14) and 90 days (HR 1.00, 0.79–1.28).
Conclusions: Based on this review of all patients in Ontario undergoing cystectomy for bladder cancer, there were no clinically significant differences in early or late morbidity or mortality outcomes between men and women.

Poster #109

Feasibility of outpatient monitoring with a wearable device after radical cystectomy

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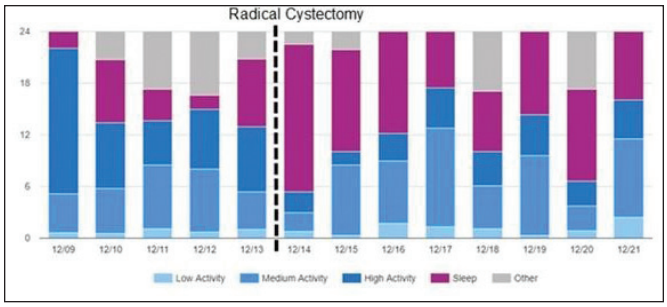
Introduction: There is a significant morbidity associated with radical cystectomy for treatment of bladder cancer and outpatient assessment of clinical status is challenging. We present preliminary data on a wearable device worn by patients who underwent radical cystectomy.
Methods: This is offered to all cystectomy patients; four have enrolled and two were able to collect data. Using an accelerometer, the Somatix device manufactured by SafeBeing is able to estimate daily steps, activity level, fluid intake, and amount of sleep. Integrated software allows the clinical team to set alerts for low thresholds of any desired metric. Weekly data was regularly reviewed. Consistently low periods of fluid intake or activity and periods of increased sleep prompted calls to the patients. Data was analyzed using t-tests.
Results: Daily steps (8369.0±2770.0, 483.8±286.6), fluid intake (851.8±395.2 cc, 757.6±357.3 cc), and sleep duration (4.71±1.96 hours, 8.09±1.32 hours) were recorded by the device for each participant in the 30-day postoperative period. For the patient who had the device activated preoperatively, a significant decrease in steps was identified (p=0.047) between the preoperative and post-discharge time periods, however, no statistical difference was observed for sleep (p=0.85) and fluid intake (p=0.60). In addition, this patient had under 50% of recommended fluid intake detected by the device for seven days, after which he presented to a clinic visit with symptoms of dehydration. Of the accrued patients, 50% were successful in operating the device and neither had re-admissions or complications. Responses to a physician-administered questionnaire

were neutral, with responses indicating that although personal experience with the device was at times frustrating and perceived as inaccurate, its use did motivate them to increase activity.
Conclusions: Although not all patients were interested or capable, outpatient monitoring does appear feasible for patients and the treatment team. While the numbers are small, the correlation with decreased fluid intake may allow for early alert of dehydration, early intervention, and prevention of readmission. Further clinical studies are needed to determine whether use of a wearable device improves outcomes after radical cystectomy.



Poster #109. Fig. 1. Activity and sleep levels in one patients during the preoperative phase (12/9/2013) and postoperative phase (12/2014-12/2021).

Oncology – Prostate

Poster #110

Six-month luteinizing hormone-releasing hormone formulations are a good choice during the COVID-19 pandemic and beyond

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Introduction: Pandemics pose certain potential complications for prostate cancer (PCa) patients who must be on injectable androgen deprivation therapy (ADT). These injections are very rarely self-administered, necessitating office visits for both the injections and laboratory work to follow the disease progression. As the patient cohort is older with comorbidities, decreasing travel risk and potential infection exposure is desirable. Luteinizing hormone-releasing hormone LHRH agonists are the most commonly used drugs for ADT in PCA. Achieving and maintaining castrate levels of testosterone (T) suppression (<50/20 g/dL) is fundamental to therapeutic success. If there are delays in administration/dosing because of patients' reluctance to come in for appointments, T levels may exceed castrate levels resulting in possible disease flare. Structuring administration to semi-annual (every six months), reduces the potential for delays in dosing and potential testosterone escape. We present an analysis of PCa patients treated with the two most commonly used ADT agents.

Methods: Observational analysis (January 1, 2007 to June 30, 2016) of U.S. oncology and urology EMR of PCa patients who received two FDA-approved forms of leuprolide acetate (LA) using different technology: in-situ gel (Gel-LA, subcutaneous) or microsphere (Msphere-LA, intramuscular). Mean late doses/year for one, three, four, six-month LHRH agonist formulations were calculated by multiplying late dose proportion and number of doses/year for each formulation. Late dose was defined as occurring after days 33, 98, 129, and 195, respectively. Furthermore, the rate of T-tests >50/20 ng/dL was evaluated.

Results: Mean late doses/year for one, three, four, six-month LHRH agonists formulations were 5.4, 0.8, 0.8, and 0.6 respectively. With late dosing for six-month formulations, 10% (Gel-LA) vs. 20% (Msphere-LA) of T values were >50 ng/dL ($p<0.05$); 29% (Gel-LA) vs. 36% (Msphere-LA) of T values were >20 ng/dL ($p<0.05$).

Conclusions: Six-month LHRH formulations may reduce the number of visits for treatment, which will likely be preferred by patients and clinicians during a pandemic. The six-month formulations had the least mean late doses/year compared to one, three, four-month formulations. Of six-month formulations, when doses were late, subcutaneous Gel-LA had a significantly lower percent of T-tests >50/20 ng/dL than intramuscular Msphere-LA. Clinicians should consider using six-month formulations that demonstrate/maintain efficacy through the end of the labeled dosing interval, so that if late for a scheduled dose, there is greater confidence of continued T suppression to <50/20 ng/dL.

Funding: Tolmar Pharmaceuticals, Inc.

Poster #111

Detecting prostate cancer with magnetic resonance imaging-ultrasound-fusion targeted prostate biopsies in patients with previously negative biopsies

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Introduction: Patients with negative transrectal ultrasound (TRUS) prostate biopsies but continued prostate specific antigen (PSA) elevation are at risk of harboring clinically significant prostate cancer (csPCa). Such patients commonly receive prostatic magnetic resonance imaging (MRI) to identify index lesions suspicious for csPCa. We report our experience with MRI-ultrasound (US) fusion biopsies in this cohort with previously negative TRUS biopsies.

Methods: In this prospective study from our institution, we included 122 patients displaying a total of 178 index lesions identified on prostatic MRI. All men had clinical suspicion of PCa, a minimum of one prior negative

N		122
Median Age (years) (range)		65 (44-80)
Mean PSA (ng/ml)		11.53 ± 6.26
Mean PSA density (ng/ml/cc)		0.22 ± 0.16
Mean Prostate volume (cm^3)		71.3 ± 43.8
Mean Interval between MRI and fusion Bx (days)		128 ± 132
Mean number of cores per lesion		2.7 ± 1.1
Mean number of cores per patient prior to fusion Bx		17.9 ± 8.6
% positive MRI-US fusion bx		44.3%
% negative MRI-US fusion bx		55.7%
Overall PCa Detection (GG≥1)		54 (44.3%)
csPCa Detection (GG≥2)		42 (34.4%)
Lesions Detected by PIRADS Score		
	PIRADS 3	61
	PIRADS 4	65
	PIRADS 5	52
% csPCa by Lesion Score		
	PIRADS 3	8 (12.5%)
	PIRADS 4	14 (21.2%)
	PIRADS 5	26 (50.0%)
% csPCa by Lesion Zone		
	Peripheral	26 (61.9%)
	Transition	16 (38.1%)
	Central	4 (9.5%)
% csPCa by Lesion Location		
	Anterior	21 (50.0%)
	Midgland	17 (40.5%)
	Posterior	8 (19.0%)

Poster #111. Table 1. Demographics of study participants, prostate cancer detection by PI-RADS score, and lesion location in patients undergoing MRI-US fusion.

TRUS biopsy, and persistent PSA elevation. Index lesions on multiparametric MRI were reviewed using PIRADS V2 scoring system. Lesions classified as PIRADS ≥3 received targeted MRI-US fusion biopsy. Biopsy-naive patients and those on active surveillance were excluded. The primary outcome was detection rate of csPCa, defined as ISUP grade group ≥2. Multivariant analysis was used to determine predictors of csPCa on fusion biopsy.

Results: Prior to fusion biopsy, patients had mean PSA 11.53, mean 17.9 negative core biopsies per patient. MRI-US fusion biopsy resulted in diagnosis of PCa in 54/122 (44.3%) patients. Clinically significant PCa was found in 8 (12.5%), 14 (21.2%), 26 (50.0%) of PIRADS 3, 4, and 5 lesions, respectively. The location of csPCa was within the peripheral zone (61.9%), anterior zone (50.0%), and transitional zone (38.1%). Clinical management following newly diagnosed csPCa identified 4.8%, 57.1%, 38.1%, receiving active surveillance, radiation treatment, and radical prostatectomy, respectively. Predictors of csPCa of fusion biopsy included age, PSA, and anterior index lesion location.

Conclusions: MRI-US fusion targeted biopsy yields high detection rates for csPCa in men with previously negative TRUS biopsies and persistent elevated PSA. Missed csPCa is often found within the anterior zone.

Poster #112

Role of multiparametric magnetic resonance imaging in prostate cancer diagnosis in men of African descent

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Introduction: It has been well-documented that men of African descent not only have a higher risk of being diagnosed with prostate cancer, but also have a higher risk of being diagnosed with more aggressive disease. The rising use of multiparametric magnetic resonance imaging (mpMRI) allows providers to identify suspicious lesions with greater accuracy and assess their need for treatment prior to prostate biopsy. The objective of this study was to examine the use of mpMRI in men of African descent with suspected prostate cancer.

Methods: A retrospective study was performed within a municipal hospital center in Brooklyn, NY from June 2017 to December 2019 of male patients who underwent a pelvic MRI. Inclusion criteria included males of African descent over the age of 18 who received at least one mpMRI and one prostate biopsy within two years of imaging to evaluate for prostate cancer. Patients diagnosed with prostate cancer grade group (GG) 2 or higher were considered clinically significant (csPCa).

Results: A total of 170 patients were reviewed and 112 had a biopsy within the timeframe to meet inclusion criteria. The median PSA for this cohort was 9.13, with a median prostate-specific antigen density (PSAD) was 0.1776. Overall, 35/51 (68.6%) patients with biopsy verified prostate cancer were identified on mpMRI. Forty-eight of 61 (78.7%) patients with a negative biopsy were identified as negative on mpMRI. A positive predictive value of 73% was observed with a negative predictive value of 75%. A summary of these findings can be found in Table 1.

Conclusions: mpMRI has a comparable detection rate in a cohort of men of African descent with suspected prostate cancer compared to that found in the literature. These results suggest that mpMRI is at least equally effective for detecting csPCa in high-risk patient populations.

Reference

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	csPCa detected	No csPCa detected
Positive MRI	35 (68.6%)	13 (21.3%)
Negative MRI	16 (31.4%)	48 (78.7%)

Poster #112. Table 1. csPCa detection rates using mpMRI.

Poster #113

Trends in incidence and survival of secondary malignancies after external beam radiotherapy for prostate cancer

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Introduction: We investigated the incidence of secondary bladder (BCa) and rectal cancers (RCa) after external beam radiotherapy (EBRT) for prostate cancer (PCa) compared to radical prostatectomy (RP) alone. We compared primary and secondary bladder/rectal cancer disease-specific survival.

Methods: This was a retrospective study using the Surveillance, Epidemiology, and End Results cancer registry. We included men with a diagnosis of non-metastatic, clinically node-negative PCa who were treated with either RP or EBRT from 1995–2011 and allowed for a five-year lag period for the development of secondary BCa or RCa. We divided patients into two eras, 1995–2002 and 2003–2011, to examine differences in incidence of secondary malignancies due to advancements in technology used to deliver radiation. Univariable and multivariable competing risk analyses with Fine-Gray subdistribution hazard and cause-specific hazard models were used to examine the risk of secondary BCa or RCa in the EBRT group compared to the RP group. Competing risks analyses were also used to compare disease-specific survival of primary vs. secondary BCa and RCa.

Results: A total of 198 184 men underwent RP and 190 536 underwent EBRT for PCa. The cumulative incidence of secondary BCa at 10 years was 0.5% for RP and 1.2% for EBRT, while that of RCa was 0.16% for RP and 0.3% for EBRT, respectively. EBRT was associated with approximately twice the risk (hazard) of developing a secondary BCa and RCa compared to RP (Table 1). The risk of secondary BCa for EBRT in 2003–2011 vs. 1995–2002 was HR 0.80 (p<0.001, Fine-Gray model), while that of secondary RCa was HR 0.69 (p<0.001) and HR 0.78 (p<0.001) for Fine-Gray

	Hazard ratio using Fine-Gray subdistribution model (95% CI)	P-value	Hazard ratio using cause-specific hazard model (95% CI)	P-value
SEONDARY BLADDER CANCER				
Treatment (reference group: surgery)				
Radiotherapy	2.12 (1.98, 2.28)	<0.001	2.53 (2.36, 2.71)	<0.001
Age (per 1 year increase)	1.006 (1.005, 1.008)	<0.001	1.006 (1.006, 1.007)	<0.001
Year of diagnosis (per 1 year increase)	0.97 (0.96, 9.98)	<0.001	0.99 (0.98, 1.00)	0.06
Race (reference group: white)				
Black	0.58 (0.52, 0.65)	<0.001	0.58 (0.51, 0.65)	<0.001
Other	0.56 (0.47, 0.67)	<0.001	0.55 (0.46, 0.66)	<0.001
Marital status (reference group: married)				
Unmarried	0.88 (0.81, 0.96)	0.004	0.93 (0.85, 1.01)	0.08
SECONDARY RECTAL CANCER				
Treatment (reference group: surgery)				
Radiotherapy	1.94 (1.69, 2.24)	<0.001	2.24 (1.96, 2.56)	<0.001
Age (per 1 year increase)	1.002 (0.997, 1.007)	0.38	1.005 (1.002, 1.008)	<0.001
Year of diagnosis (per 1 year increase)	0.94 (0.92, 0.96)	<0.001	0.96 (0.94, 0.97)	<0.001
Race (reference group: white)				
Black	1.07 (0.89, 1.28)	0.46	1.07 (0.90, 1.28)	0.44
Other	1.19 (0.93, 1.53)	0.17	1.17 (0.91, 1.50)	0.22
Marital status (reference group: married)				
Unmarried	0.92 (0.78, 1.08)	0.32	1.04 (0.88, 1.21)	0.66

Poster #113. Table 1. Multivariable analysis using competing risks and cause-specific hazard model for development of secondary bladder and rectal cancer after primary treatment for prostate cancer.

and cause-specific hazard models, respectively. The risk of BCa death was 27% and 9% lower for secondary BCa vs. primary BCa in the Fine-Gray model after RP or EBRT, respectively. There was no difference in RCa-specific survival between primary or secondary RCa (after RP or EBRT).
Conclusions: The risk of BCa and RCa is approximately twice as high for men undergoing EBRT for localized PCa compared to RP. Men who develop secondary BCa have a lower risk of cancer-specific death than primary BCa. Patients who received radiotherapy in 2003–2011 had a lower risk of developing a secondary malignancy, likely reflecting advancements in technology for radiation delivery.

Poster #114

Lifetime risk of prostate cancer death among high-risk germline mutation carriers

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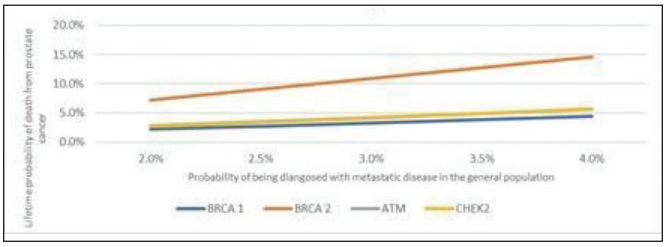
[1]University of Toronto, Toronto, ON, Canada; [2]University Health Network, Toronto, ON, Canada

Introduction: Prostate cancer was the cause of death for 30 486 men in 2017, ranking second only to lung cancer in male cancer deaths. Approximately one in eight men who are diagnosed with prostate cancer will die of it. It has been well-established that certain germline pathogenic variants confer both an increased risk of being diagnosed with prostate cancer and dying of prostate cancer. Contemporary data demonstrate that mutations which disrupt the function of genes involved in repairing DNA damage are associated with aggressive prostate cancer. The objective of this study is to estimate the prostate cancer specific morality burden among individual carrying high-risk germline mutations.
Methods: We performed a Bayesian estimation of prostate cancer metastases and mortality probability. Prior estimates for the prevalence of germline mutations and the risks of metastases and death were derived from a systematic review of the literature. We accounted for genetic anomalies in *BRCA 1*, *BRCA 2*, *ATM*, and *CHEK2*. Primary outcomes were prostate-specific survival and metastases free survival. Sensitivity analyses were conducted to test the effects of uncertainty in prior estimates.
Results: We estimated the lifetime probability of prostate cancer diagnosis as 11%, of developing metastatic prostate cancer as 2–4%, and of prostate cancer specific death as 3–4%. The probability of having a high-risk genetic anomaly was: *BRCA1:* 0.7%, *BRCA2:* 1.3%, *ATM:* 1%, and *CHEK2:* 1.2%. The lifetime probability of developing metastatic prostate cancer varied from 2.4% for *BRCA1* to 16.3% for *BRCA2* carriers. The lifetime probability of dying from prostate cancer varied from 2.2% for *BRCA1* to 14.6% for *BRCA2* carriers (Fig. 1).
Conclusions: This is the first study to estimate lifetime risk of metastatic disease and death among carriers with high-risk mutations. In particular, patients with a *BRCA2* mutation experience an extremely high risk of prostate cancer death. Novel prevention strategies should be encouraged within this population.



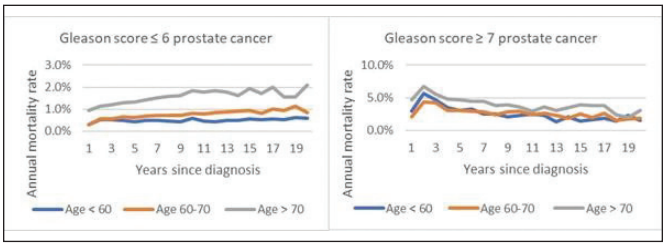
Poster #114. Fig. 1. Lifetime probability of prostate cancer-specific mortality by estimates of risk for selected genetic anomalies.

Poster #115

Patterns of mortality after prostate cancer: A SEER-based analysis

Roderick Clark, *Steven Narod*
Women's College Hospital, Toronto, ON, Canada

Introduction: Low-grade prostate cancer is widely considered to be an indolent disease based on excellent short-term survival rates. To obtain an accurate representation of prostate cancer mortality, it is important to follow patients for sufficient time to capture most prostate cancer-related deaths. The objective of our study was to analyze prostate cancer mortality rates up to 25 years from diagnosis using a large population-based cohort of unselected prostate cancer patients.
Methods: We conducted a population-based, cohort study using data from the Surveillance, Epidemiology and End-Results (SEER) program. We identified 116 796 prostate cancer cases diagnosed from 1992–1997 and followed them until 2017. Our primary outcome was prostate cancer-specific survival. We calculated annual prostate cancer mortality rates and actuarial survival rates using by age of diagnosis, tumor grade and race.
Results: The annual prostate cancer mortality rate was 1.5%. The rate was higher than this for older men (2.1%), for black men (1.9%) and for men with cancer of Gleason score 7 and above (3.1%). There were 21 896 deaths from prostate cancer (23% of all deaths). The majority of deaths (55.6%%) occurred in men with low-grade disease. Among men with high-grade cancers, most deaths (54.3%) occurred in the first five years. Among men with low-grade cancers, most deaths (70.1%) occurred after five years.
Conclusions: In this large cohort study, the annual prostate-specific mortality for men with low- grade disease increased with time since diagnosis. The majority of deaths from prostate cancer in the U.S. occur in men initially diagnosed with low-grade disease.



Poster #115. Fig. 1. Annual mortality rate by years since diagnosis in PCa patients with ***(A)*** Gleason score ≤6; and ***(B)*** Gleason score ≥7.

Poster #116

The impact of attained age on prostate cancer mortality

Roderick Clark[1], *Danny Vesprini*[2], *Steven Narod*[1]
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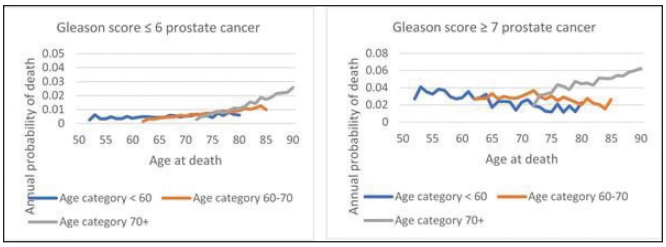
Introduction: The annual risk of dying of prostate cancer varies by tumor grade, the age at diagnosis, and the number of years elapsed since diagnosis. We have previously shown that among men with low-grade prostate cancer, the risk of death from cancer increases steadily with time since diagnosis, whereas for men with high-grade prostate cancer, the risk of dying peaks at three years post-diagnosis and declines thereafter. The objective of our study was to evaluate the joint effects of age of diagnosis and attained age on annual mortality among men with prostate cancer.
Methods: We conducted a population-based cohort study using data from the Surveillance, Epidemiology and End-Results (SEER) program. We identified 116 796 prostate cancer patients diagnosed from 1992–1997 and followed them until 2017 (median 13.0 years, IQR 7.0–20.2). Our primary outcome was the annual prostate cancer mortality rate.
Results: Of the 89 715 men included in the study, 14.2% died of prostate cancer and 58.5% died of another cause. The median age of diagnosis was 69 years (IQR 63–73), the median age of death from prostate cancer was 79 years and the median age of death from other causes was 82 years. For individuals diagnosed with Gleason score ≤6 prostate cancer,



Poster #116. Fig. 1. Annual prostate cancer mortality rate by age in patients with ***(A)*** Gleason score ≤6; and ***(B)*** Gleason score ≥7.

the annual prostate cancer mortality rate increased continuously with attained age. For individuals diagnosed under the age of 70 with Gleason score ≥7 prostate cancer, the annual prostate cancer mortality rate did not increase with age.

Conclusions: Men with low-grade prostate cancer show a continuous increase in the risk of dying of prostate cancer as they age, irrespective of their age of diagnosis. This suggests that low-risk prostate cancers enter a prolonged period of tumor dormancy and reactivation of dormant tumors occurs more frequently as the patient ages.

Poster #117

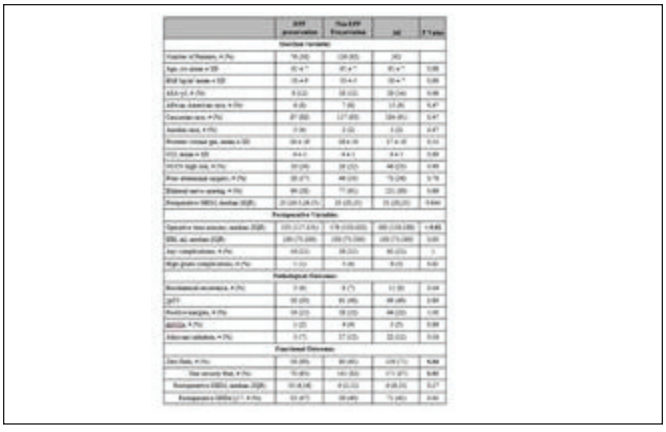
Does preservation of endopelvic fascia, puboprostatic ligaments, and dorsal venous complex with hydrodissection of neurovascular bundles improve rates and time to continence after robot-assisted radical prostatectomy?

Ahmed S. Elsayed[1], Hannah B. Ely[1], Holly Houenstein[1], Zhe Jing[1], Umar Iqbal[1], Yousuf Ramahi[1], Gaybrielle James[1], Mahmoud A. Abdelhakim[2], Ismail R. Saad[2], Julian Joseph[1], Sharifeh Almasaid[1], Ahmed A. Hussein[1], Omar Abdelrazzack[2], Khurshid A. Guru[1]

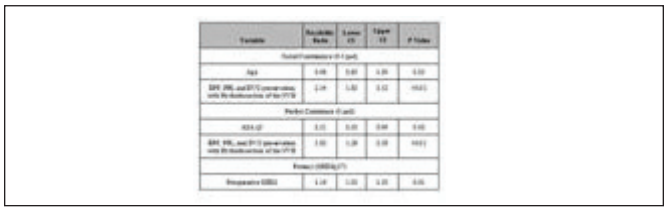
[1]Roswell Park Comprehensive Cancer Center, Buffalo, NY, United States; [2]Cairo University Hospitals, Cairo, Egypt

Introduction: We aimed to report the oncological and functional outcomes of endopelvic fascia (EPF), puboprostatic ligaments (PPL), and dorsal venous complex (DVC) preservation with hydrodissection of the neurovascular bundles (NVB) during robot-assisted radical prostatectomy (RARP).

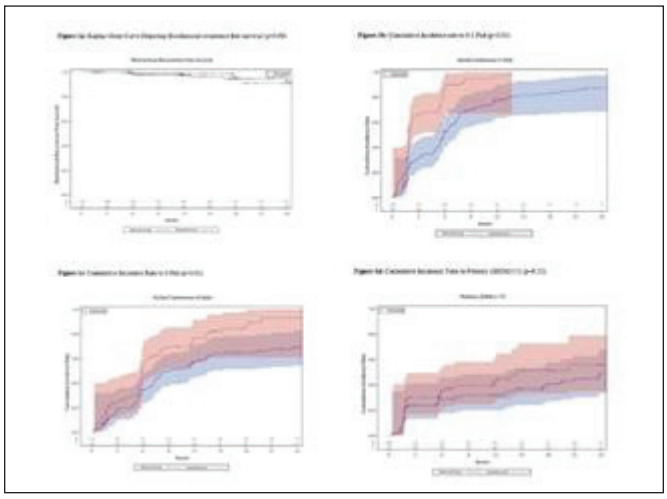
Methods: A retrospective review of our prostate cancer database was performed. Patients who underwent either bilateral or unilateral nerve sparing-RARP were identified. Propensity score matching was performed in a ratio of 1:1.6 between new surgical technique (group 1) and a historical group (group 2). Data was reviewed for perioperative, oncological, and functional outcomes. Kaplan-Meier curves were used to depict biochemical recurrence free survival (BRFS). Cumulative incidence curves were used to depict perfect continence (0 pads), social continence (0–1 pad) and potency (SHIM ≥17). Multivariate analyses (MVA) were used to depict variables associated with continence and potency.



Poster #117. Table 1A.



Poster #117. Table 1B.



Poster #117. Fig. 1.

Results: A total of 202 patients were included in the study (76 in group 1 and 126 in group 2) with a median followup of 17 months (Table 1A). Kaplan-Meier curves showed similar BRFS (p=0.98). Group 1 showed higher perfect continence rates at one month (9% vs 3%), three months (24% vs. 19%), and six months (54 vs. 34%) compared to group 2. Group 1 showed higher social continence rates at one month (15% vs. 3%), three months (67% vs. 32%), and six months (87% vs. 53%) compared to group 2 (Fig. 1). MVA showed that group 1 was associated with perfect (HR 1.82, 95% CI 1.29–2.58, p<0.01) and social continence (HR 2.54, 95% CI 1.83 – 3.52, p<0.01), but not potency (Table 1B).

Conclusions: EPF, PPL, and DVC preservation with hydrodissection of the NVB offered similar oncological outcomes, but earlier and improved urinary continence rates compared to standard dissection.

Funding: Roswell Park Alliance Foundation.

Poster #119

Impact of a national comprehensive cancer network compliant multidisciplinary conference on treatment decisions in patients with localized prostate cancer: 2009–2019

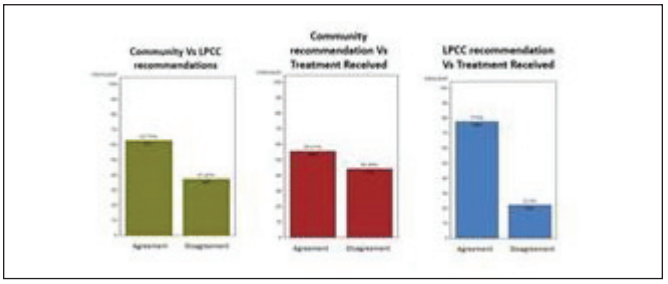
Umar Iqbal, Ahmed A. Hussein, Holly Houenstein, Stephanie Newman, Blake Peterson, Katarina Krajacic, Adeena Samoni, Ahmed S. Elsayed, Eric Kauffman, James Mohler, Michael Kuettel, Khurshid A. Guru

Roswell Park Comprehensive Cancer Center, Buffalo, NY, United States

Introduction: We sought to investigate the impact of compliance with National Comprehensive Cancer Network (NCCN) guidelines on the treatment received by patients with prostate cancer.

Methods: A retrospective review of a localized prostate cancer database between 2009 and 2019 was performed. Patients who presented for a second opinion at our NCCN-compliant institution were presented to the multidisciplinary localized prostate cancer conference (LPCC) (includes

Poster #119. Table 1.



Poster #119. Fig. 1.

urologists, medical oncologists, radiation oncologists, radiologists, genitourinary pathologists, and patient advocates). Patients who received treatment outside our institution were contacted to determine the treatment received. Data was analyzed for concordance between the LPCC recommendations, initial recommendations by the community urologist, and the actual treatment received by patients.

Results: Community treatment recommendations were available for 1302 patients. Median age was 65 (IQR 60–70) years; 25% had NCCN low-risk, and 23% had NCCN-high risk prostate cancer. Disagreement between LPCC and community-based recommendations was present in 485 (37%) patients (Fig. 1). In the disagreement cohort, 212 (44%) were recommended radiation in the community-based practices. Disagreement was high for patients that were recommended active surveillance by LPCC (53%), of who 26% were recommended radiation by community practices. (Table 1). Recommendations by the LPCC matched treatment received in 78% cases, compared to 56% match with community recommendations. Discordance with treatment was highest in community-based recommendation for radiation (72%), of which 31% received active surveillance and 26% received radical prostatectomy.

Conclusions: Community-based recommendation was discordant with NCCN-compliant recommendations in over one-third of patients. Compliance with NCCN Guidelines was associated with increased uptake of active surveillance.

Funding: Roswell Park Alliance Foundation.

Poster #120

Western New York urology experience with accuracy of the 4Kscore test for positive prostate biopsy prediction: Is the 4Kscore useful in the reluctant patient?

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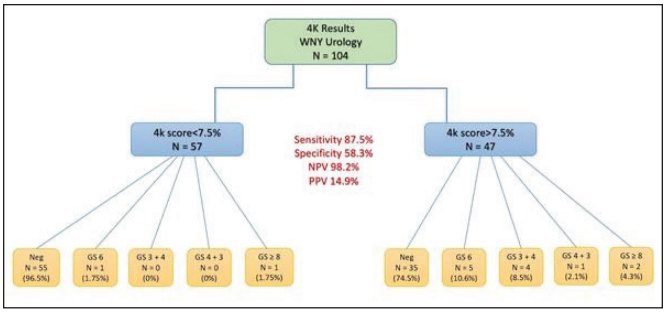
Introduction: Urologists continue to search for an ideal balance for selectively detecting aggressive prostate cancer while minimizing overtreatment. The 4Kscore test is one of the tools developed to better risk stratify patients for biopsy in an aim to increase high grade prostate cancer detection. The 4Kscore is based on the total PSA, free PSA, intact PSA, human kallikrein-related peptidase 2, and patients' clinical information. The goal of our study was to report the accuracy of the 4Kscore test based on prostate biopsy results from local patients.

Methods: Retrospective chart analysis was performed on 104 patients who had undergone a 4Kscore Test and prostate biopsy at Western New York Urology between 2016 and 2020. Industry-recommended cutoff of 4Kscore >7.5% was used to represent a positive result, indicating increased risk of finding aggressive prostate cancer on biopsy. The patients were then divided into two groups based on 4Kscore, and the data was then analyzed to assess the concordance of 4Kscore with biopsy results.

Results: Of the 104 patients, 57 patients had a 4Kscore <7.5%. Of those patients, 55 (96.5%) had negative prostate biopsy (Gleason <6), with a negative predictive value 98.2%. Forty-seven patients had 4K score >7.5%. Of those, 35 (74.5%) had a negative prostate biopsy (Gleason <6), five (10.6%) had Gleason 6 disease, four (8.5%) patients had Gleason 3+4, one (2.1%) patient had Gleason 4+3, and two (4.3%) patients had Gleason ≥8. The positive predictive value of a positive 4Kscore was 14.9% and the specificity of the 4Kscore to a positive prostate biopsy result was 58.3%.

Conclusions: Patients with a negative 4Kscore are likely to have a negative prostate biopsy. However, a positive 4Kscore has a poor ability to correctly predict a positive prostate biopsy result. Given that the 4Kscore test was often used in the hesitant patient with a prior negative biopsy, our dataset is enriched for negative biopsy results, which may be a reason for the lower specificity than previously reported in the literature. Overall, our experience shows limited utility of the 4Kscore test in convincing a hesitant patient to pursue biopsy, however it may be useful in quelling anxiety in the more nervous patient given the high negative predictive value.



Poster #120. Fig. 1.

Poster #122

Safety of darolutamide (DARO) for non-metastatic castration-resistant prostate cancer (nmCRPC) from extended followup in the phase 3 ARAMIS trial

Chris Pieczonka[1], Matthew Smith[2], Karim Fizazi[3], Teuvo Tammela[4], Felipe Melo Cruz[5], Luke Nordquist[6], Urban Emmenegger[7], Glauco Silveira[8], Raoul Concepcion[9], Adriano Paula[10], Carlos Augusto de Mendonca Beato[11], Neil Fleshner[12], Martin Richardet[13], Iris Kuss[14], Marie-Aude Le Berre[15], Gustavo Borghesi[16], Toni Sarapohja[17], Neal Shore[18]

[1]Associated Medical Professionals, Syracuse, New York, United States; [2]Massachusetts General Hospital Cancer Center, Boston, MA, United States; [3]Institut Gustave Roussy, University of Paris Sud, Villejuif, France; [4]Tampere University Hospital and Tampere University, Tampere, Finland; [5]Instituto Brasileiro de Controle do Câncer, São Paulo, Brazil; [6]GU Research Network, Omaha, NE, United States; [7]Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; [8]Centro Oncológico do Triângulo, Uberlândia, Brazil; [9]Urology Associates PC, Nashville, TN, United States; [10]Hospital Araujo Jorge, Goiânia, Brazil; [11]Hospital Amaral Carvalho, São Paulo, Brazil; [12]Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; [13]Sanatorio Aconcagua, Córdoba, Argentina; [14]Bayer AG, Berlin, Germany; [15]Bayer Healthcare SAS, Loos, France; [16]Bayer AG, Berlin, Germany; [17]Orion Corporation Orion Pharma, Espoo, Finland; [18]Carolina Urologic Research Center, Myrtle Beach, SC, United States

Introduction: DARO significantly prolonged median metastasis-free survival and overall survival. Adverse events (AEs) of interest commonly associated with androgen receptor inhibitor (ARI) therapy, such as fatigue, falls, fractures, rash, mental impairment, and hypertension, can impact patient daily life. In the final analysis of the double-blind (DB) period, DARO had a favorable safety profile, showing ≤2% difference vs placebo (PBO) for most AEs of interest. Fatigue was the only AE with >10% incidence. Permanent discontinuation due to AEs was also similar between DARO and PBO (8.9% vs. 8.7%). Here, we present safety data for prolonged treatment with DARO from the final analysis of the DB + open-label (OL) period.

Methods: Patients (pts) with nmCRPC (N=1509) were randomized 2:1 to DARO or PBO while continuing androgen deprivation therapy. The data cutoff for the primary analysis of the DB period was September 3, 2018. Study unblinding occurred on November 30, 2018, after which DARO pts still receiving study treatment continued with OL DARO. The data cutoff for final analysis of the DB+OL period was November 15, 2019.

Results: At the final analysis, the median treatment duration for DARO was 18.5 months for the DB period and 25.8 months for the DB+OL period. At the final cutoff date, 48.8% of patients in the DARO DB+OL group were still receiving DARO treatment. The increase in the incidence of any-grade AEs (85.7% vs. 89.8%) and serious AEs (26.1% vs. 32.1%) between the DB and DB+OL period was small. Between the DB and DB+OL periods, only minor numerical changes for ARI-associated AEs were observed. When the incidences were corrected for exposure, there were minimal differences between the DB and DB+OL period. Fatigue was the only ARI-associated AE of interest with >10% incidence in the DARO arm during the DB+OL period. The incidence of permanent discontinuation of DARO due to AEs increased slightly from 8.9% during the DB period to 10.5% during the DB+OL period; the incidence of discontinuation of PBO due to AEs during the DB period was 8.7%.

Conclusions: With longer treatment exposure, DARO remained well-tolerated. In the DB+OL period, no new safety signals were observed. The expected increases in incidence of AEs between the DB and DB+OL periods largely disappeared when adjusted for the longer exposure, confirming the favorable safety profile of DARO with prolonged treatment.

Funding: Bayer/Orion. Dr. Borghese, a former employee of Bayer, contributed to the development of this work,

Poster #123

Quality of life for men at risk of prostate cancer: A descriptive analysis from a large Canadian cohort

Roxane Tourigny[1], Hanane Moussa[1], Karine Robitaille[1], Fred Saad[2], Michel Carmel[3], Armen Aprikian[4], Yves Fradet[1], BIOCaPPE-GRéPEC Network[1,2,3,4], Vincent Fradet[1]

[1]CHU de Québec Research Center - Université Laval, Quebec, QC, Canada; [2]CHUM Research Center, Montreal, QC, Canada; [3]CHUS Research Center, Sherbrooke, QC, Canada; [4]MUHC Research Institute, Montreal, QC, Canada

Introduction: Prostate cancer is the most common cancer among Canadian men. Men diagnosed with prostate cancer usually live with an indolent disease for many years. Unfortunately, prostate cancer treatments lead to important side effects and have a major impact on quality of life. Many studies evaluated quality of life of men diagnosed with prostate cancer and quality of life related to treatments. However, only few studies looked at the quality of life from men at risk of prostate cancer, and none were performed in Canada. Here, we aim to describe the quality of life of a large Canadian men cohort at risk of developing prostate cancer.

Methods: General and prostate cancer-related quality of life was collected for 2055 men at risk of prostate cancer enrolled in a multicentric prospective observational study called BIOCaPPE_GRéPEC. This clinical study aims at evaluating the impact of various biomarkers that are linked to lifestyle habits on prostate cancer incidence at two years. Men enrolled in this study have either a high level of prostate specific antigen (PSA, 2.5–10 ng/mL), or a recent (<1 year) negative first prostate biopsy. Quality of life was evaluated using validated questionnaires, including: 1) Hospital Anxiety and Depression Scale (HADS); 2) 36-Item Short-Form Survey (SF-36); 3) International Prostate Symptoms Score (IPSS); and 4) Sexual Health Inventory for Men (SHIM).

Results: General quality of life analyses were conducted with 2014 participants, while prostate cancer-specific quality of life analyses were conducted with 2010 participants. Among these, 274 (13.6%) were classified as borderline and 122 (6.1%) as abnormal cases of anxiety; 94 (4.7%) were classified as borderline and 39 (1.9%) as abnormal cases of depression; 1067 (54.0%) had moderate to severe lower urinary tract symptoms and 155 (7.8%) had severe erectile dysfunction symptoms. The majority of participants had a health-related quality of life similar or even better than Canadian men in general, for all domains and components evaluated. Finally, 1096 participants (55.5%) were satisfied with their quality of life caused by urinary symptoms.

Conclusions: This study is the first description of the quality of life in such a large Canadian cohort of men at risk of prostate cancer. Our results suggest that the majority of men at risk of prostate cancer perceive their health-related and prostate cancer-related quality of life adequate, despite the majority of these men have moderate to severe lower tract urinary symptoms. Symptoms related to anxiety, depression and erectile dysfunction are less common.

Funding: Cancer Research Society.

Poster #124

Real-world treatment patterns among patients diagnosed with metastatic castration-sensitive prostate cancer in community oncology settings

Daniel George[1], Neeraj Agarwal[2], Jennifer Rider[3], Benjamin Li[4], Rohan Shirali[3], Rickard Sandin[5], Agnes Hong[6], David Russell[4], Krishnan Ramaswamy[4], Stephen Freedland[7,8]

[1]Duke Cancer Institute, Durham, NC, United States; [2]Huntsman Cancer Center, University of Utah (NCI-CCC), Salt Lake City, UT, United States; [3]ConcertAI, Memphis, TN, United States; [4]Pfizer Inc, New York, NY, United States; [5]Pfizer Inc, Sollentuna, Sweden; [6]Astellas Pharma, Northbrook, IL, United States; [7]Cedars-Sinai Medical Center, Los Angeles, CA, United States; [8]Durham VA Medical Center, Durham, NC, United States

Introduction: Androgen deprivation therapy (ADT) was standard of care for metastatic castration-sensitive prostate cancer (mCSPC) for decades. Combining ADT with docetaxel or novel hormonal therapies (NHT), starting in 2015 and 2017, has demonstrated improved survival vs. ADT alone.

Treatment patterns in patients with mCSPC

mCSPC 1L regimen	Median duration to next regimen (months)	Initiation of 1L treatment following mCSPC diagnosis (%) 2014	2015	2016	2017	2018	2019
ADT + AA	14.3	42.6%	31.9%	31.7%	20.1%	19.8%	16.5%
ADT	8.9	20.4%	19.8%	22.0%	21.5%	15.8%	26.6%
ADT + NHT ± AA	14.3	10.2%	11.2%	14.6%	19.2%	27.7%	34.2%
ADT + DOC ± AA	10.8	8.3%	19.8%	14.6%	22.0%	17.0%	10.1%
Other treatment	n/a	18.5%	17.2%	17.1%	17.3%	19.8%	12.7%

AA, anti-androgen; *ADT*, androgen deprivation therapy; *DOC*, docetaxel; *mCSPC*, metastatic castration-sensitive prostate cancer; *n/a*, not available; *NHT*, novel hormone therapy; *1L*, first-line.

Poster #124. Table 1. Treatment patterns in patients with mCSPC.

This study examined the impact of new evidence on treatment selection for mCSPC in real-world practice.

Methods: Electronic medical record data from U.S.-based oncology practices in the ConcertAI Oncology Dataset were used to retrospectively evaluate treatment patterns in mCSPC patients initiating first-line (1L) therapy (2014–2019). We determined the proportion receiving 1L regimen, duration of therapy until next regimen, and trends in 1L regimen. For inclusion in an anti-androgen containing regimen, patients had to use anti-androgens for ≥90 days.

Results: A total of 858 mCSPC patients were included (70% white, 16% black, 3% Hispanic, and 11% other race/unknown). Median age at mCSPC diagnosis was 69 years, and 63% presented with de novo metastases. The most common mCSPC 1L regimens were ADT + older anti-androgen (26.3%, mainly bicalutamide), ADT monotherapy (20.5%), ADT + NHT ± anti-androgen (19.2%), and ADT + docetaxel ± anti-androgen (16.4%). The remaining 17.5% received various other therapies, including anti-androgen monotherapy (5.9%) or NHT ± anti-androgen (5.5%). NHT included abiraterone, apalutamide, and enzalutamide. ADT + NHT ± anti-androgen treatment increased each year, while ADT + docetaxel ± anti-androgen treatment peaked in 2017 and then decreased (Table 1). ADT + anti-androgen was the most common therapy in 2014 but declined since. Median duration until initiation of a subsequent regimen was 14.3 months for ADT + NHT ± anti-androgen and 10.8 months for ADT + docetaxel ± anti-androgen. Differences in 1L treatment patterns across white and black patients were not statistically significant in unadjusted analyses.

Conclusions: Even in 2019, over half of patients with mCSPC did not receive 1L therapy now known to significantly improve survival (ADT + NHT or ADT + docetaxel) over ADT alone. Those who did, received shorter durations of treatment than observed in registrational trials. We found no initial evidence of racial disparities in treatment. The disconnect between trial evidence and real-world practice could be due to patient/disease characteristics, cost/access issues, or provider awareness. A better understanding of potential factors is worthy of study.

Funding: Pfizer and Astellas Pharma.

Poster #125

Comparison of post-biopsy hospitalization rates At WNY Urology to national benchmarks with use of prophylactic ciprofloxacin-ceftriaxone prior to transrectal ultrasound-guided prostate biopsy

Andrew Skomra[1], Raymond Pominville[1], Michael Shapiro[2], Ichabod Jung[2], Courtney Jung[3]

[1]State University of New York at Buffalo, Buffalo, NY, United States; [2]Western New York Urology, Dunkirk, NY, United States; [3]University of Rochester, Rochester, NY, United States

Introduction: Transrectal ultrasound guided prostate biopsy (TRUS-PB) is the mainstay for accurate diagnosis of prostate cancer. Postoperative sepsis remains the greatest morbidity associated with the procedure, making it imperative to optimize prophylaxis protocols. Luong et al provided evidence that a combination protocol of ciprofloxacin and ceftriaxone reduced local hospital admission rates following TRUS-guided prostate biopsy compared to ciprofloxacin alone. Current AUA guidelines for antibiotic prophylaxis recommend a 24-hour dose of either a fluoroquinolone or 1st/2nd/3rd generation cephalosporin. National post biopsy infection and sepsis rates are reported as 0.1–7.0% and 0.3–3.1%, respectively. This IRB-approved retrospective study follows up on our prior in-house publications to evaluate the efficacy and long-term durability of our prophylaxis protocol from October 2012 to September 2019 compared to national benchmarks for post-biopsy hospitalization.

Methods: Data was collected from TRUS-PB performed by Western New York Urology from October 2012 to September 2019. Patients were prescribed one dose of ciprofloxacin 500 mg PO one hour prior to the biopsy and ceftriaxone 1 gm IM at the time of the biopsy. No additional doses of antibiotics were given and the protocol required a Fleet enema prior to the biopsy. The post-biopsy hospitalization rate was compared to national benchmarks and hospitalizations were reviewed for risk factors such as diabetes status, antibiotics exposure six months prior, and antibiotic resistance.

Results: A total of 22 101 biopsies were included in the cohort for the specified time period. The post-prostate biopsy infection hospitalization rate was 0.14% (31 patients total). Of hospitalized patients, 90.3% (28 patients) fit systemic inflammatory response syndrome criteria, and all of such fit sepsis criteria with positive urine and/or blood cultures. Three patients had *E. coli* with resistance to both ciprofloxacin and ceftriaxone, two patients had *E. coli* with resistance to ceftriaxone, and two patients had *E. coli* with resistance to ciprofloxacin. Of risk factors reviewed, 29% of hospitalized patients had diabetes and 16% had antibiotics exposure within the past six months.

Conclusions: A prophylactic pre-biopsy protocol including combination ciprofloxacin and ceftriaxone has continued to provide post-biopsy sepsis and hospitalization rates significantly below the national average. This rate has remained stable over the seven-year span that was evaluated in this study, without evidence of significant spikes in antibiotic resistance patterns. Additional analysis of factors involved in the success of this protocol (compliance, biopsy technique, facility practices) is warranted.

Poster #126

Use of machine learning with local fractal dimension and wavelet decomposition to detect prostate cancer lesions from multiparametric MRI

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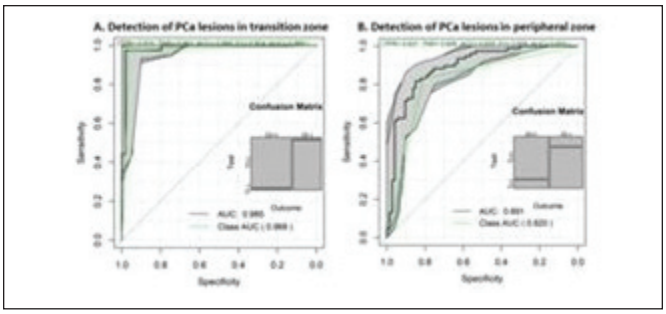
Introduction: Multiparametric MRI (mpMRI) has aided in the identification of clinically significant prostate cancer (PCa) while minimizing the detection of low risk lesions. However, some lesions are not detected by mpMRI. Improved detection of PCa with mpMRI may reduce the number of biopsies needed to obtain a diagnosis and could reduce delays in diagnosis. Machine learning (ML) provides a potential path to improve the detection of PCa lesions from mpMRI imaging.



Poster #126. Fig. 1.

Methods: After obtaining IRB approval, we identified 92 patients who underwent radical prostatectomy (RP) and 24 patients who underwent simple prostatectomy (SP) after undergoing 3T mpMRI. Final pathology was negative for PCa for all who underwent SP. Pertinent patient demographics were obtained from the EMR. Each RP specimen was re-examined by GU trained pathologists and PCa lesions were plotted onto prostate maps. The prostate maps and mpMRI images were provided to Qmetrics Technologies in Rochester, NY. Qmetrics Technologies used local fractal dimension and wavelet decomposition signatures from T2 weighted imaging (T2WI) and diffusion weighted imaging (DWI) to develop a predictive model using ML from a logistic regression algorithm. Imaging signatures only from the transition zone (TZ) were used from those who underwent SP for additional PCa negative images to aide in the development of the model.
Results: The average age of the patient at RP was 65 (range 53–79). The average PSA preceding RP was 10.7 ng/mL (range 2–79.6) with an average prostate volume was 44 cc (range 19–170). All PCa lesions were conventional adenocarcinoma. Four patients had only Gleason score 6 PCa. PCa lesions were found to have different contextual properties compared to benign regions. Using the model developed with this cohort of patients, the area under the curve (AUC) receiver operating characteristics (ROC) curve to detect PCa using T2WI and DWI is shown in Fig. 1 with an AUC of 0.985 for detecting TZ lesions and 0.891 for detecting peripheral zone (PZ) lesions.
Conclusions: ML with a logistic regression algorithm using local fractal dimension and wavelet decomposition using T2WI and DWI resulted in excellent detection of PCa lesions. Further validation of the model will be needed with a non-training set of images.

Poster #127

Increased primary care PSA screening rates in at-risk and underserved populations after multidisciplinary collaborative

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Introduction: Prostate cancer (PCa) screening has been shown to prevent approximately 1.3 deaths from localized and three deaths of metastatic PCa per 1000 men screened. At our county hospital, which serves a majority underserved patient population, we previously determined that 20.2% of men aged 55–69 years old were screened for PCa using a prostate-specific antigen (PSA) test in the primary care setting with no racial inclination to screening. For context, published figures show approximately 33% of men aged 50 or older receive routine PCa screening with at least a PSA. The purpose of this study is to provide an update on our PSA screening rates after implementation of a quality improvement initiative between urologists and primary care physicians.
Methods: From August 2019 to August 2020, we implemented formal didactic presentations in the Departments of Family Medicine and Internal Medicine. AUA screening algorithms were posted in their primary care clinics. Lastly, we implemented a full-time PCa liaison in charge of community outreach and in-hospital screening. Patient demographics, including if a PSA test was ordered, were collected cumulatively for all men aged 55–69-years-old seen at the ECMC primary care clinics at six-, 12-, and 18-month intervals after the intervention initiation.
Results: In the first six months of intervention (n=797), 34.6% of eligible men were screened for PCa compared to the pre-intervention screening rate of 20.8% (p<0.00001); 41% of African Americans were screened for PCa, while 27.5% of non-African American men were screened (p=0.000062). During the first 12 months of multidisciplinary collaboration, a total of 1823 patients were identified. Overall, 25.7% of eligible men were screened for PCa using a PSA test (p=0.000017). African Americans were screened at a rate of 32.2% compared to 18.6% of non-African American men (p<0.00001). Notably, 18 months following the initiation of our intervention (n=3798), PSA screening rates fell to 18.6% overall (p=0.11), with 23.5% of African American and 13.4% of non-African American men screened (p<0.00001).
Conclusions: In this single-institution, county hospital setting, screening for PCa in primary care clinics significantly increased after implementation of our intervention at the six- and 12-month period. There was a significant racial predilection to PSA screening aimed at screening more African American patients. Most interesting, in an extended followup, we noted a decline to our starting point in PCa screening coinciding with the COVID-19 pandemic, underscoring the possible underscreening effects of the pandemic.

Poster #128

Health-related quality of life in prostate cancer patients using the patient oriented prostate utility scale (PORPUS)

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Introduction: Patient-reported outcomes (PRO; both preference- and non-preference-based) are critical to measuring health-related quality of life (HRQoL), and providing clinically effective and cost-effective care. However, limited longitudinal information is available to evaluate the HRQoL in prostate cancer (PCa) patients across health states and to account for demographic-, clinical-, disease-, and treatment-related covariates. The Patient Oriented Prostate Utility Scale (PORPUS) is a validated disease specific instrument to assess patient preferences and health state utilities across 10 domains of PCa care.
Methods: PORPUS-P (psychometric) and PORPUS-U (utility) scores were prospectively measured in questionnaires provided to PCa patients receiving care at the University Health Network (Princess Margaret Cancer Centre) between May 2003 and September 2016. Data surrounding demographic-, clinical-, disease-, and treatment-related covariates were collected from the Prostate Cancer Database and chart review. Further demographic information for each patient was additionally linked by geographic census subdivision regions (StatsCan postal code conversion). All (complete) patient respondents were included and then assessed for health state membership at the time of each PORPUS measurement based on validated decision rule algorithms (where available) and clinical expertise. Generalized estimating equation (GEE) linear models were completed to assess demographic-, clinical-, disease-, and treatment-related covariates predictive of psychometric and utility scores, after adjusting for clustering by repeated patient measurements. Health state scores were pooled for all eligible observations belonging to each health state.
Results: A total of 45 235 PORPUS questionnaires were completed by 9650 patients (4.7 measurements/pt, range 1–43). PORPUS-P and PORPUS-U scores were 78.8 (IQR 69–87.5) and 0.981 (IQR 0.944–0.994) for patients across the entire cohort over a median followup of 6.78 (IQR 3.75–10.3) years. Larger community sizes (rurality by quintile), higher income quintile, non-widowed marital status, increasing education, and certain ethnicities were associated with increased PORPUS scores. Additionally, poor clinical characteristics, including advanced age, increased comorbidity, and worsening Gleason score, were associated with lower psychometric and utility scores. Most relationships demonstrated dose-dependence. PSA demonstrated an inverted-U-shaped relationship with HRQoL scores, potentially signifying a treatment-related effect.
Conclusions: Understanding HRQoL across the PCa journey is critical to evaluating the clinical- and cost-effectiveness of existing and new therapies. These results represent the largest cohort of PRO in PCa and will be critical to clinical, economic, and policy application.

Covariate	Level	PORPUS Estimate	95% Lower	95% Upper	p-value
Community Size (1 = Metropolitan, 5 = Rural)	1	2.05	0.73	3.37	0.002
	2	2.23	0.39	4.07	0.018
	3	1.65	0.04	3.25	0.044
	4	2.20	0.25	4.14	0.027
	5	Reference			
Income Quintile (1 = Low, 5 = High)	1	-4.59	-5.45	-3.73	<0.001
	2	-2.82	-3.59	-2.04	<0.001
	3	-1.91	-2.67	-1.14	<0.001
	4	-1.62	-2.34	-0.90	<0.001
	5	Reference			
Marital Status (Missing = 9921, 22%)	Never married	-1.52	-4.17	1.13	0.26
	Separated / Divorced	-0.76	-2.33	0.82	0.35
	Widowed	-3.01	-5.63	-0.39	0.024
	Married / Living with Partner	Reference			
Education (Missing = 32930, 73%)	Finished High School	3.92	1.50	6.35	0.002
	Some University / College	3.95	1.71	6.19	<0.001
	University / College Degree	5.26	3.27	7.24	<0.001
	Graduate Degree	5.25	3.25	7.24	<0.001
	Less than High School	Reference			
Ethnicity (Missing = 15415, 34%)	Aboriginal	-3.87	-11.8	4.02	0.34
	African Descent	0.10	-1.36	1.55	0.90
	Arab	-6.08	-9.93	-2.23	0.002
	Ashkenazi Jew	0.27	-0.60	1.14	0.55
	Asian	-1.20	-2.85	0.45	0.15
	Indian Subcontinent	-3.18	-5.40	-0.96	0.005
	Latin America	1.92	-1.47	5.32	0.27
	Mixed Descent	1.61	0.11	3.12	0.035
	European / Caucasian	Reference			
Age	Per Year	-0.43	-0.45	-0.40	<0.001
	Per Decade	-4.27	-4.51	-4.02	<0.001
Charlson Comorbidity Index (Missing = 19128, 42%)	0	12.7	9.50	16.0	<0.001
	1	8.28	5.00	11.6	<0.001
	2	6.35	2.95	9.75	<0.001
	3	2.37	-2.07	6.80	0.30
	4+	Reference			
PSA (Missing = 3067, 6.8%)	Undetectable	-6.13	-6.62	-5.64	<0.001
	0-4	-2.62	-3.02	-2.21	<0.001
	4-10	Reference			
	10-20	-0.74	-1.29	-0.18	0.009
	20+	-3.52	-4.60	-2.44	<0.001
Biopsy Grade (Missing = 9335, 21%)	ASAP / Microfocus	-0.20	-1.24	0.84	0.70
	Gleason ≤6	-1.24	-1.87	-0.61	<0.001
	Gleason 7	-4.84	-5.54	-4.14	<0.001
	Gleason 8+	-10.3	-11.4	-9.20	<0.001
	No Cancer	Reference			

Poster #128. Table 1.

Poster #129

Overall survival and metastasis-free survival by depth of prostate-specific antigen decline in the PROSPER trial of men with non-metastatic castration-resistant prostate cancer treated with enzalutamide

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Introduction: The PROSPER trial demonstrated prolonged metastasis-free survival (MFS) and overall survival (OS) for men with non-metastatic castration-resistant prostate cancer (nmCRPC) and rapidly rising prostate-specific antigen (PSA) treated with enzalutamide + androgen deprivation therapy (ADT) vs. placebo + ADT. The final analysis of PROSPER reported longer median OS with enzalutamide versus placebo (67.0 months vs. 56.3 months). Post-hoc analyses of PROSPER evaluating PSA dynamics demonstrate longer MFS with greater PSA decline and increased risk of metastases in patients with even modest PSA progression versus those without. Here, we further explored the relationship between PSA dynamics and outcomes in PROSPER using uniquely defined PSA subgroups of decline.

Maximum PSA decline category	N (%)	Median OS (95% CI) months	HR (95% CI)	Median MFS (95% CI) months	HR (95% CI)
< 50%	131 (14%)	34.6 (28.6, 42.2)	Ref	13.8 (11.0, 14.9)	Ref
50% to < 90%	189 (21%)	50.0 (45.5, 55.5)	0.492 (0.36,0.67)	26.2 (21.9, 29.6)	0.363 (0.26, 0.52)
≥ 90%, PSA nadir ≥ 0.2 ng/mL	242 (27%)	64.0 (63.4, NR)	0.262 (0.19,0.36)	36.6 (29.6, NR)	0.175 (0.12, 0.26)
≥ 90%, PSA nadir < 0.2 ng/mL	343 (38%)	NR (NR, NR)	0.097 (0.07, 0.14)	NR (NR, NR)	0.059 (0.04, 0.09)

HR, hazard ratio; MFS, metastatic-free survival; NR, not reached; OS, overall survival; PSA, prostate-specific antigen.

Poster #129. Table 1.

Methods: Eligible men in PROSPER had nmCRPC, a PSA level ≥2 ng/mL at baseline, and a PSA doubling time ≤10 months. Men continued ADT, were randomized 2:1 to enzalutamide 160 mg daily vs. placebo and had PSA evaluation at week 17 and every 16 weeks thereafter. This post-hoc analysis evaluated OS and MFS for four mutually exclusive subgroups defined by PSA nadir using men with PSA reduction <50% as the reference group. The hazard ratio (HR) is based on an unstratified Cox proportional hazards analysis model.

Results: A total of 1401 men were enrolled in PROSPER; 933 were treated with enzalutamide and PSA data were available for 905. Measured at nadir, 38% of these men achieved PSA reduction ≥90% (actual nadir <0.2 ng/mL) and another 27% achieved PSA reduction ≥90% (actual nadir ≥0.2 ng/mL). Among men in the placebo arm of PROSPER, only 3/457 reported PSA reduction ≥90%. The degree of PSA decline was associated strongly with both median MFS and OS (Table 1).

Conclusions: In men with nmCRPC and rapidly rising PSA treated with ADT plus enzalutamide, there was a strong association between the degree of PSA decline and survival outcomes. Assessing PSA by both percent decline and actual decline below 0.2 ng/mL may serve as a surrogate of outcome when treating nmCRPC with enhanced androgen signaling inhibition.

Funding: Pfizer and Astellas Pharma.

Poster #131

Optimization of postoperative pain control after robotic prostatectomy with peripheral nerve blocks

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Introduction: Multimodal perioperative pain management aims to reduce narcotic use and contributes to enhanced postoperative recovery. Abdominal wall peripheral nerve blocks (PNB) are performed routinely by anesthesiologists for various abdominal surgeries as an adjunct modality of pain control. As robotic-assisted laparoscopic prostatectomy (RALP) is among the most common abdominal surgeries performed by urologists, the use of preoperative abdominal wall PNB was recently initiated at our institution. The aim of this study is to determine the safety and efficiency of preoperative abdominal wall PNB in patients undergoing RALP.

Methods: We retrospectively reviewed all patients undergoing RALP at our institution who received a preoperative abdominal wall PNB. All surgeries were performed by a single surgeon. Type of abdominal wall PNB performed and local anesthetic agent used was selected by the anesthesiologist of record for the case. Paravertebral blocks were performed at the T10-T12 vertebral levels and local anesthetic was injected lateral to the vertebrae to target spinal nerves innervating the anterior abdominal wall as they exit the intervertebral foramina. Quadratus lumborum blocks are fascial plane blocks. Local anesthetic was injected into the thoracolumbar fascia lateral or posterior to the quadratus lumborum muscle in order to numb the thoracolumbar nerves innervating the anterior abdominal wall. Patient demographics, block type and drug used, block procedure time, total opiate dose received in the post-anesthesia care unit (PACU), total opiate dose received during inpatient admission, inpatient pain score, and immediate postoperative course were examined. Opiate doses were converted to morphine milligram equivalents (MME).
Results: Ten patients received an abdominal wall PNB prior to undergoing RALP. Mean patient age was 65 years (57–74 years). Five patients received a bilateral paravertebral block at the T10-T12 vertebral levels. Five patients received bilateral quadratus lumborum blocks. Mean block procedure time was 10 minutes (4–14 minutes). Mean PACU opiate use was 10.4 MME (0–29 MME). Mean postoperative opiate dose was 17.8 MME (0–70 MME). Mean postoperative pain score was 2.8 (0.5–6.9). All patients were discharged on postoperative day 1. After discharge, there were no deviations from the normal postoperative course.
Conclusions: In this initial feasibility study, abdominal wall PNB is a safe and efficient modality of postoperative pain control in patients undergoing RALP. Further data collection aims to confirm these findings and determine the impact of abdominal wall PNB on reducing postoperative narcotic use and time to discharge after RALP.

Poster #132

The gut microbiome-prostate tumor crosstalk is modulated by dietary polyunsaturated fatty acids

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Introduction: Recently, the gut microbiota emerged as an important factor for success of immunity-based cancer treatments. However, its steady-state interaction and contribution to developing tumors is largely unexplored in non-intestinal cancers. Our objective was to investigate the connection between prostate tumor and the gut microbiota independently of cancer therapies.
Methods: Human fecal samples were obtained from men participating into a phase IIb double-blind randomized controlled trial testing 3 g/day of monoglyceride-eicosapentaenoic acid (MAG-EPA) vs. placebo for a 4–10-week period before their radical prostatectomy (NCT02333435). A second set of samples were from men taking the same intervention of MAG-EPA or placebo after a PSA increase following their radical prostatectomy (NCT03753334). 16srRNA libraries were amplified for each fecal DNA sample by targeting a fragment of the V3-V4 hypervariable region of the bacterial 16S rRNA gene. High-throughput sequencing of the bar-coded amplicons was performed on a MiSeq apparatus and the bioinformatic analysis of the reads was conducted using Mothur pipeline. In addition to human fecal samples, fully immunocompetent C57BL/6 mice were injected subcutaneously with 2.0 x106 TRAMP-C2 or PTEN-/- or PTEN-/- RB1-/- mouse prostate cancer cells to measure changes in the gut microbiota during tumor growth. We also recapitulated the MAG-EPA intervention in our TRAMP-C2 mice model and fed by gavage four different fatty acids (omega-9 (high oleic sunflower oil), omega-6 (MAG-arachidonic acid) and two different omega-3 (MAG-docosahexaenoic and MAG-EPA).
Results: In human fecal samples from prostate cancer patients, we observed a reduced gut microbiota diversity correlating with tumor stage. We also found that tumor growth was sufficient to modulate the microbiota in three independent prostate cancer syngeneic mouse models. We showed that transplanted human gut flora was sufficient to modulate ectopic prostate tumor growth, supporting the causal impact of gut microbiota for prostate cancer. We finally investigated this gut-tumor connection using purified polyunsaturated fatty acids prebiotics in patients and mice. We observed a reduction in the levels of Ruminococcaceae following dietary omega-3 supplementation that correlated with prostate cancer downgrade in patients and reduced tumor growth in mice.
Conclusions: Overall, our findings suggest that diet-actionable components of the gut microbiome can regulate prostate cancer growth.
Funding: Prostate Cancer Canada, Grant #D2016-1336 and was proudly funded by the Movember Foundation.

Poster #133

PSA outcomes of NCCN low, favorable-intermediate, and unfavorable-intermediate prostate cancer treated with single-round ADT followed by IMRT

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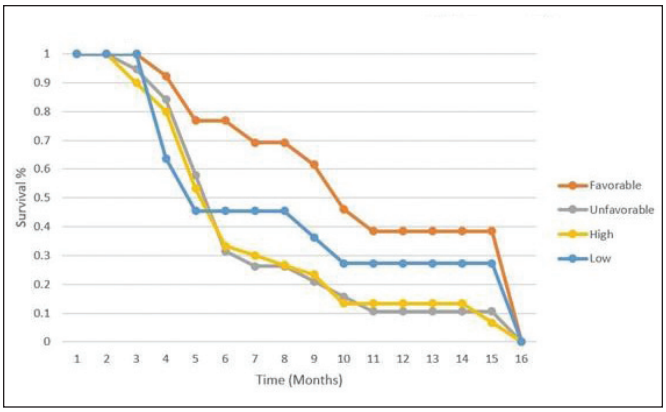
Introduction: Despite improved survival rates for men with prostate cancer over the past several decades, treatment algorithms continue to evolve. Appropriate treatment is based on NCCN risk stratification by digital rectal exam (DRE), prostate biopsy with Gleason score, and serum PSA with/without imaging such as MRI or US. A retrospective study of 1024 patients revealed the distinction between favorable- and unfavorable-intermediate risk groups was the presence of Gleason group 4, number of positive cores ≥50%, and presence of >1 intermediate risk factor, such as T2b-c, PSA



Poster #133. Fig. 1. KM curve for PSA levels in NCCN risk levels.

10–20 ng/mL, and Gleason score 7. Androgen deprivation therapy (ADT) has shown no survival benefit in previous studies for patients with low-grade disease. Dose-escalated radiation therapy (RT) has been deemed a safe treatment option for favorable-intermediate. RT and a short course of ADT may improve outcomes in the unfavorable-intermediate group. We aim to retrospectively evaluate PSA outcomes of patients with low, favorable-intermediate, and unfavorable-intermediate risk prostate cancer after treatment with neoadjuvant ADT and IMRT.

Methods: Queried Medent for prostate cancer patients treated with neoadjuvant ADT and IMRT from June 2008 to January 2021. PSA results evaluated using a Kaplan-Meier curve created over a timeline of 0–15 months and an event defined as a PSA of 0.5 ng/mL. Omitted patients without PSA values after completion of treatment or pre-treatment PSA value <0.5, incomplete treatment of IMRT, or >1 dose ADT.

Results: Patients were risk stratified according to NCCN guidelines: low-risk (n=11), favorable-intermediate (n=13), unfavorable-intermediate (n=19), and high-risk (n=30). Low-risk patient PSA levels dropped most rapidly, while favorable-intermediate had the highest PSA levels after completion of therapy. Unfavorable-intermediate and high-risk curves were nearly identical. This data does not account for changes in PSA after reaching ≤0.5.

Conclusions: The data shows measurable PSA decline for patients treated with single-dose, neoadjuvant ADT and IMRT regardless of NCCN risk. Current findings will be used to compare patients treated with IMRT alone and monitor PSA >0.5 for biochemical recurrence. This may be useful in determining if single-dose ADT is associated with prostate cancer remission. Opportunity for further investigation may also include evaluation to assess the effects of ADT (psychologically, quality of life).

Pediatrics

Poster #134

Trends in testicular salvage rate for testicular torsion: comparison of the pre- and post- quality metric eras

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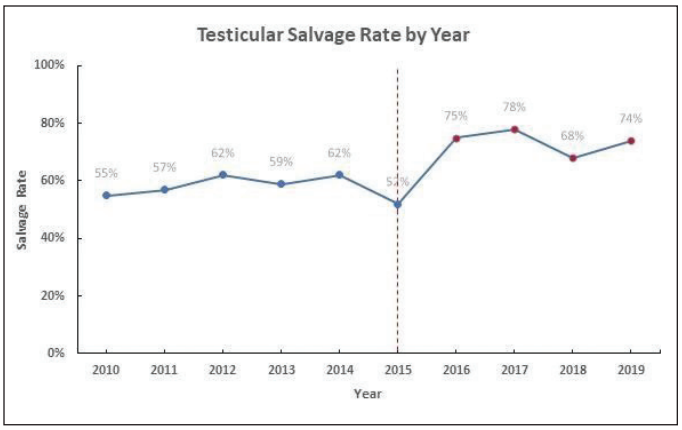
Introduction: Management of testicular torsion is predicated on prompt intervention with the goal of testicular salvage by limiting ischemia time. On June 15, 2015, US News & World Report included pediatric testicular torsion as a scored quality metric with a benchmark time to the operating room of <4 hours. Many hospitals have since instituted protocols to expedite transfer and treatment of testicular torsion. We describe the impact of quality metrics on the rate of testicular salvage from a national, multi-institutional database.

Methods: Using the Pediatric Health Information System (PHIS) database, we performed a retrospective analysis of all patients ≥1 year of age diagnosed with testicular torsion (by primary ICD 9 or 10 code) that underwent surgery between January 2010 and December 2019. Patients were placed in pre-metric (before June 15, 2015) or post-metric (after June 15, 2015) cohorts based on date of presentation. Hospitals that did not report both pre- and post-metric outcomes were excluded. The primary outcome measure was testicular salvage, defined as orchiopexy without concurrent orchiectomy. Mean age, ethnicity, distance to treating hospital, household income, insurance status, and use of scrotal ultrasound were compared.

Results: A total of 890 patients (551 pre-metric, 339 post-metric) from 38 hospitals were included in our study. Testicular salvage rates increased from 58.4% (pre-metric) to 70.9% (post-metric, p<0.001). There were no differences in mean age (p=0.92), ethnic distribution (p=0.81), distance to treating hospital (p=0.92), household income (p=0.69), commercial versus public payor insurance status (p=0.31), or utilization of scrotal ultrasound (p=0.08).



Poster #134. Fig. 1. Annual testicular salvage rates between 2010 and 2019. Quality metric for testicular torsion implemented on June 15, 2015 (dotted red line).

Conclusions: Testicular salvage rates have improved since the implementation of quality metrics for testicular torsion. This may be in part due to new hospital protocols instituted in response to quality metric scoring that have expedited treatment, as patient factors were similar in pre- and post-metric cohorts.

Poster #135

Survey of applicant experience in the pediatric urology fellowship match

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Introduction: Annual urology residency match statistics are useful to both applicants and programs to identify trends in applications, interviews, and match rates. There is a paucity of data describing urologic fellowship matches. The pediatric urology match is especially difficult to analyze due to the lack of a centralized application service. We seek to describe match statistics for pediatric urology and the application experience.

Methods: A 19-item survey was sent to all applicants to the 2019 pediatric urology fellowship match. Information on demographics, application related considerations, interviews received and attended, interview related costs, and overall impression of application and interview process was collected.

Results: A total of 23 out of 31 total applicants responded to survey, including 18 applicants who matched to fellowship. There were matched applicants from every AUA region. Seventeen of these matched applicants trained in North America, and five matched within the same AUA section as they completed residency. The mean number of applications sent was 11.3 (range 5–16), with 76% (13/17) being offered an interview everywhere they applied. The other four applicants were offered an interview at all but one program. The mean number of interviews attended was 9.9 (range 3–13), at an estimated cost of $4676 (range 2000–7000) per applicant. Nine applicants did not attend every interview they were offered, with the most common reason being "too much time away from program" followed by "financial burden." Vacation time was used by 59% (10/17) of applicants to attend interviews. The most common consideration for where to apply was clinical volume, followed by mentor recommendation (Table 1). Lastly, most applicants (11/17) did not find the application easy to complete/submit and 94% (16/17) would support a centralized application system, instead of the current system of emailing applications and letters of recommendation to individual program directors.

Conclusions: Applicants for pediatric urology match come from every AUA region and represent a diverse group of residents. Currently, almost all applicants are receiving interviews at every program they apply to, resulting in a significant cost and time away from program. There appears to be a desire for a streamlined application and interview process.

Considerations for where to apply to fellowship							
	Not at all important	A little important	Somewhat important	Very important	N/a	Total	Weighted average
Mentor recommendation	0	2	4	3	0	9	3.11
Financial consideration	11	1	0	0	0	12	1.08
Prestige	0	1	4	1	1	7	3
Geographic location	0	5	1	2	1	9	2.63
Clinical volume	0	0	1	10	0	11	3.91
Research experience	0	3	6	0	1	10	2.67

Poster #135. Table 1. Considerations for where to apply to fellowship.

Poster #136

Management of intrinsic vs. extrinsic causes of ureteropelvic junction obstruction in children: Outcomes and complications from a large, prospective cohort study

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Introduction: Ureteropelvic junction obstruction (UPJO) can be caused by intrinsic and or extrinsic (i.e., crossing vessels [CV]) obstruction. Although different in underlying pathology, authors have commonly grouped both etiologies of UPJO together in evaluating treatment options and outcomes. The aim of this study is to evaluate clinical characteristics and outcomes of patients undergoing laparoscopic dismembered pyeloplasty (LDP) for intrinsic and extrinsic UPJO in children.

Methods: We performed a retrospective review of prospectively collected data on patients who underwent LDP between 2008 and 2020 at our institution. The etiology of UPJO was diagnosed by retrograde pyelogram at the beginning of each procedure, and intraoperative findings during laparoscopy. We compared patient characteristics and clinical outcomes between patients with intrinsic versus extrinsic UPJO using Student's t tests for continuous variables, and Chi-squared tests for categorical variables.

Results: A total of 154 patients underwent LDP during the study period. 103(67%) were obstructed from an intrinsic cause, and 51 (33%) had CV. Patients with an intrinsic cause of UPJO were younger (mean [SD] age 73 [52] months vs. 128 [58] months, p<0.001), whereas patients with CV were more likely to be symptomatic (92% vs. 63%, p<0.001). Among 117 patients who had a preoperative renal scan, no significant difference was seen in diuretic t1/2 (70 [102] minutes for intrinsic group vs. 87 [173] minutes for CV, p=0.5. Additionally, both groups had similar rates of SFU grade 4 hydronephrosis on ultrasound preoperatively (44% intrinsic and 47% CV). A significant difference was observed in the rate of overall complications (7.8% intrinsic vs. 0% CV, p=0.041); all recurrences (n=5, 3.2%) occurred in the intrinsic group. No difference in hospital length of stay was observed between groups (median two days).

Conclusions: UPJO secondary to CV is associated with 0% recurrence compared to 3.2% for intrinsic obstruction in this large prospective series. Although distinct entities, both intrinsic obstruction and CV are managed safely and effectively with LDP.

Poster #137

Postoperative pediatric urology opioid prescriptions at an academic medical center

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Introduction: Opioid abuse is a public health crisis, and this often starts postoperatively. Limited data are available on the prescribing patterns of pediatric urology practitioners. We sought to determine rates of postoperative opioid prescriptions following urologic surgery at a tertiary academic center, and to identify what factors are related to receiving an opioid prescription.

Methods: We retrospectively reviewed charts from pediatric urology patients (aged 0–18 years) who underwent at least one procedure in the operating room between January 1, 2017 and December 31, 2019. We collected data describing incidence of opioid prescribing, as well as gender, age, surgeon, procedure, length of hospital stay, ethnicity, race, and whether opioids had been a home medication. We grouped procedures into five categories: circumcision, cystoscopy with removal of foreign body/stone/stent, scrotal surgery, hypospadias repair/penile surgery, and pyeloplasty/ureteral reimplant. Multivariable logistic regression was used to determine odds ratios of opioid prescriptions.

Results: A total of 1102 children had data available;14.2% (n=156) of patients received opioid prescriptions. Using circumcision as a baseline, scrotal surgery increased the odds of an opioid by 1.32. Hypospadias repair, pyeloplasty, and other procedures reduced the odd by 0.45, 0.47, and 0.52, respectively. No patient received opioids for endoscopic procedures. Ambulatory procedures had a lower rate of opioids (0.40). Age was a major factor, increasing the likelihood of receiving a prescription by a factor of 1.45 per year of age. Since January of 2017, the prescription rate has been reduced by 0.926 per month.

Conclusions: A total of 85.8% of postoperative pediatric urology patients at our institution were not provided with prescription opioids. Factors associated with a higher likelihood of receiving a prescription were increasing age and scrotal surgery. Our rate of opioid use decreased over the three years examined.

Poster #138

Optimal port placement for pediatric robotic-assisted laparoscopic pyeloplasty in congenitally abnormal kidneys

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Introduction: Congenital renal abnormalities can manifest in several forms including pelvic and thoracic kidneys, horseshoe kidneys, malrotation and cross-fused renal ectopia. Such anatomical variants may pose unique technical challenges in those requiring operative management of ureteropelvic junction obstruction. Comprehensive preparation including precise positioning and optimum port placement is vital to surgical success. We examined the extent to which these factors impact upon case characteristics and outcomes following pediatric robotic-assisted laparoscopic pyeloplasty.

Methods: A single-center, retrospective review was designed to investigate the case characteristics of robotic-assisted laparoscopic pyeloplasties performed from January 2013 to March 2021 at UPMC Children's Hospital. Patient positioning and port placement was analyzed and outcomes comparison was conducted between age-matched ectopic and orthotopic kidney groups based on duration of case, length of hospital stay, and success rates.

Results: Five robotic pyeloplasties were performed between 2013 and 2021 at UPMC Children's Hospital in patients with congenitally abnormal kidneys. These included two pelvic kidneys, one horseshoe kidney, one cross-fused ectopic kidney, and one malrotated kidney with a high anterior ureteral insertion. The control group comprised twenty robotic pyeloplasties performed in orthotopic kidneys. Demographic differences between the two groups were statistically insignificant (mean age 10.6 years vs. 9.3 years, respectively). Port placement for orthotopic kidneys included a 12 mm infraumbilical camera port and two 8 mm ports, one supraumbilical and the other in the lower quadrant corresponding to the affected side. Pelvic kidney port placement involved displacement of the supraumbilical port contralateral to the affected kidney. This same port was translated superiorly to the subxiphoid position for the horseshoe and malrotated kidneys. Cross-fused ectopic kidney ports included a 12 mm supraumbilical camera port and three 8 mm ports located in the subxiphoid, right lower quadrant and infraumbilical regions. Mean case time for ectopic kidneys was 297 minutes compared to 282 minutes for orthotopic kidneys (p>0.05). Mean length of hospital stay was 1 vs. 1.1 days, respectively (p>0.05). One hundred percent of ectopic kidney pyeloplasties were successful. One orthotopic pyeloplasty required reoperation, followed by nephrectomy. Lateral decubitus position was used in all cases except for pelvic kidneys, for which the dorsal lithotomy position was adopted.

Conclusions: Adaptations in port placement and operative approach in the setting of ectopic and congenitally abnormal kidneys enable an individualized approach to maintain equivalence in clinical outcomes among pediatric patients requiring robotic pyeloplasty.

Trauma

Poster #139

Urological intervention during hemipelvectomy for pelvic malignancy: Experience from a comprehensive cancer center

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Introduction: Hemipelvectomy (HP) is used in the multimodality management of primary neoplasms of the bony pelvis, as well as locally invasive soft-tissue sarcomas and carcinomas. Collaborative multidisciplinary operative intervention is often required for successful extirpation. The aim of this study was to characterize urological involvement in patients undergoing management for pelvic malignancy with internal (IHP) and external (EHP) HP.
Methods: A retrospective database analysis was performed for all cases of internal (limb sparing) and external (limb amputation) HP performed at a comprehensive cancer center from January 2011 to July 2020. All patients were 18 years of age or older. Data gathered included age, gender, surgical laterality, primary tumor type, resection type, history of chemoradiation, neural manipulation, urological procedure, and postoperative complications. Resection type was classified as: type 1 (iliac wing), type 2 (periacetabular), or type 3 (pubic rami).
Results: In total, 221 cases of HP were queried for urological intervention. Ureteral stents were placed in 208 (94%) patients. Eighteen patients (IHP; n=12, EHP; n=6) were identified who required surgery based on involvement of urological structures. Mean age and followup were 55 years and 12±16 months, respectively. The most common primary tumor type was soft-tissue sarcoma. Type 3 resection most commonly required urological intervention. Type of urological intervention included: bladder, prostate, urethral mobilization (56%), cystorrhaphy (39%), cystectomy and diversion (22%), ureteral reimplant (22%), ureterolysis (11%), urethral repair (11%), corporal repair (11%), and partial cystectomy in 6%. Urological complication rate was 75% for IHP and 50% for EHP. Additional urological procedures were required in 8 (44%) patients. Low-grade complications included urinary tract infection, urinary retention, and erectile dysfunction while complications that required intervention included hematuria, urinary leak, urinary obstruction, urinary incontinence, and bladder fistulae.
Conclusions: HP is uncommon and urological involvement during surgical resection is infrequent. Intervention is most frequently required during resection of the pubic rami. The most common intervention involves some degree of bladder, prostate, or urethral mobilization. The rate of reoperation related to urological complications after the initial surgery is high. Patients should be counseled that they may require multiple procedures if the urinary tract is affected.

Poster #140

Outcomes of ileal interposition for ureteral obstruction following treatment of abdominopelvic malignancy

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Introduction: Ileal interposition is a technique for ureteral reconstruction when the length of ureteral injury or disease precludes direct reimplantation. Given the risks of incorporating intestinal segments into the urinary tract, this technique is infrequently employed. The aim of this study was to characterize the outcome of ileal interposition for the management of ureteral obstruction from tumor and ureteral stricture following treatment for abdominopelvic malignancy.
Methods: A retrospective database analysis was performed for all cases of ileal ureteral interposition performed by four surgeons at a comprehensive cancer center from January 2013 to December 2020. Patients were ≥18 years of age and included if undergoing ileal interposition in either the primary setting of a surgical procedure for tumor extirpation or in the delayed setting as a solitary procedure. Data gathered included age, gender, primary diagnosis, etiology of obstruction, length and location of injury, type of repair, length of bowel segment, renal function, and complications. Statistical significance was defined by $p<0.05$.
Results: In total, 22 patients undergoing repair of 26 ureteral units were included. The mean age was 59.4 years. Median followup was 15 months (range 1– 49). The most common oncological primary diagnoses were colorectal (32%), urothelial (32%), and cervical (23%) cancer. The etiologies of ureteral obstruction were malignant in 45% and ureteral stricture in 55%. The left ureter was involved in 58% of cases and right ureter in 42%. The mean length of bowel segment used in left-sided, right-sided and cystoplasty repair was 15.1 cm, 16.3 cm, and 25.3 cm, respectively. Types of repair included unilateral (n=12), bilateral (n=1), interposition to an ileal conduit (n=3), and interposition with cystoplasty (n=6). Reconstruction for malignant obstruction occurred more frequently in the primary setting (82%) while repair for ureteral stricture occurred more frequently in the delayed setting (91%). There was no significant difference (p=0.06) between the mean preoperative (Cr 1.06, GFR 75) and postoperative (Cr 1.16, GFR 70) renal function. Seven minor (Grade 1–2) and four major (Grade 3) complications developed.
Conclusions: Ileal ureteral interposition is successfully utilized as a reconstructive technique at the time of en bloc resection involving the ureter and to address ureteral stricture in the delayed setting. The complication rates secondary to the ureteral reconstruction are low and renal function is preserved.

Poster #141

Multi-institutional review of non-hypospadiac penile urethral stricture management and outcomes

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Introduction: Penile urethral strictures are common and have many different etiologies and management strategies. Most of the published research evaluating these strictures include patients with a history of congenital hypospadias in their analyses. We compiled a multi-national, multi-institutional retrospective database of the etiology, surgical management and outcomes of urethroplasty in patients with non-hypospadiac causes of penile urethral strictures to capture how these strictures are approached, as well as in hopes to assess whether certain surgical approaches and techniques are more successful than others.

Methods: A retrospective review from 12 institutions of patients who underwent urethroplasty for anterior urethral strictures classified by The Trauma and Urologic Reconstructive Network of Surgeons (TURNS) as segments S2b or S2c for non-hypospadiac etiology with at least one month of postoperative followup were used for this analysis. Patient demographics were collected, as well as incision used and repair techniques. Postoperative exams were completed heterogeneously via different modalities (radiographically, cystoscopically or by voiding parameters) based on surgeon preference and the definition of "surgical success" was left to the discretion of the operating surgeon to report on.
Results: A total of 214 patients were included in this review with median age of 57 years (range 18–88) and median followup of 52 months (range 1–241). Etiology of stricture was 2.3% external trauma, 21.0% idiopathic, 37.4% internal trauma, 0.5% recurrent stricture in prior urethroplasty segment excluding hypospadias repairs, 0.5% radiation induced, 5.6% infectious/inflammatory and 32.7% lichen sclerosus. Incision used was 27.6% circumcising, 22.9% penoscrotal 26.2% perineal, 3.7% transurethral and 19.6% ventral penile with success rates of 72.9%, 73.5%, 80.4%, 100%, and 88.1%, respectively. Technique used was 20.1% Asopa, 2.3% Asopa+ventral inlay, 31.8% dorsal onlay, 0.5% excision and primary anastomosis, 10.7% fasciocutaneous flap (FCF), 27.6% staged, 3.7% ventral inlay, and 3.3% ventral onlay, with success rates of 79.1%, 100%, 83.8%, 100%, 52.2%, 79.7%, 100%, and 71.4%, respectively. Using Chi-squared analysis, oral mucosal grafts (OMG) were found to be more successful than FCF with p=0.001.
Conclusions: Penile urethral strictures are approached with a wide variety of techniques with relatively good outcomes despite which technique used. When a graft or flap is required, OMG appears to have better outcomes than FCF.

Poster #142

Clinical characteristics associated with wound closure in patients with Fournier's gangrene: a single tertiary institution experience

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Introduction: Fournier's gangrene (FG) is a surgical emergency requiring early aggressive debridement of infected tissue. The subsequent defect must then close either via primary or secondary intention, the latter often with adjunct graft or flap to bridge gaps in tissue. To date, no study has analyzed associations between patients with closed and unclosed wounds. We sought to identify factors associated with wound closure during index hospitalization.
Methods: We retrospectively reviewed all cases of FG using the electronic medical records system at one hospital of our tertiary care institution from 2016–2020. All patients who underwent at least one debridement were identified and stratified into wound closure during index hospitalization versus no wound closure. Patients who expired during hospitalization or did not undergo surgical debridement were excluded. We analyzed patient data including median age, gender, median body mass index (BMI), diabetes (DM) rate, insulin dependent diabetes (IDDM) rates, admission glucose level, smoking status, Fournier's Gangrene Severity Index (FGSI) on admission, need for ICU admission, median length of stay (LOS), use of wound vacuum assisted closure (VAC) devices, and median number of surgical operations.

	Closed (n=64)	Open (n=44)	P-value
Age	54%	54%	0.75
BMI	38.3	35.7	0.35
Male Gender	78%	70%	0.50
Smoker	57%	44%	0.97
DM	52%	73%	**0.04**
Insulin Dependence	33%	40%	0.73
Admission Glucose	178	233	0.74
FGSI	6	7	0.38
ICU Admission	83%	75%	0.45
LOS	19.2	18.3	0.50
# Operations	8	6	0.12
Wound Vac	78%	91%	0.14

Poster #142. Table 1. Summary of patient characteristics in patients who underwent closure vs. unclosed (open) wounds for FG.

Results: A total of 108 patients were identified at our institution with 64 (59%) patients undergoing wound closure (Table 1). Most patients were male (78%) and were smokers (57%). There were no significant differences in age, BMI, smoking status, FGSI, IDDM, admission glucose level, need for ICU admission, LOS, VAC usage, and number of operations. The median LOS was 18.8 days and was not different between the two groups. There was a statistically significant association between unclosed wounds and DM rates, however no significant differences in rates of IDDM or admission glucose levels. Although more operations were required in the closed group, this did not rise to the level of significance (p=0.12)
Conclusions: This is the first single-center study directly examine associations between wound closure and patient demographics and hospital course. Our institutional study demonstrated comorbid DM as statistically significant association with delayed wound closure. Future, larger studies are required to determine patient and clinical course factors that may also be associated with wound closure in the index hospitalization.