Continuous Antibiotic Prophylaxis for Urinary Tract Infections in Prenatal Hydronephrosis: A Systematic Review and Meta-Analysis
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Introduction: While continuous antibiotic prophylaxis (CAP) is recommended to prevent urinary tract infections (UTIs) in infants with prenatal hydronephrosis (HN), this recommendation is not evidence-based. Herein, we attempted to systematically review the current literature to determine whether CAP reduces UTIs in patients with prenatal HN.

Materials & Methods: Applicable trials were identified through an electronic search of MEDLINE (1948-2015), EMBASE (1980-2016), CINAHL (1982-2016), and CENTRAL (1995-2016) and through a hand search of American Urological Association (2012-2015), European Society of Pediatric Urology (2012-2015) abstracts and reference lists of included trials. The strategy was not limited by language or year of publication. Eligible studies compared CAP versus no CAP (control) in patients who had prenatal diagnosis of hydronephrosis. Both retrospective and prospective studies were included. Two independent reviewers performed title and abstract screening, full text review and quality appraisal.

Results: Of 1518 citations screened, 10 full studies were included, contributing 3909 patients for final analysis. Of these, 38% were considered high quality when assessed by the Newcastle Ottawa Scale. Meta-analysis of non-randomized trials (n=10) provided a pooled odds ratio of 0.84 (95% CI: 0.45-1.55). The pooled effect size for randomized trials (n=6) was 0.66 (95% CI: 0.38-1.14). The heterogeneity was 0% (I²) for non-randomized trials and 77% (I²) for randomized trials. The pooled effect size for randomized controlled trials (n=7) was 0.50 (95% CI: 0.28-0.90). The heterogeneity was 0% (I²) for randomized controlled trials. The absolute absence of retention in the newborn group (without osteotomy) was considered high grade HN. One delayed repair was complicated by bladder rupture secondary to cystotomy incision. Dissection it involves, may also place the delayed CPRE girls at risk for urinary retention. The absolute absence of retention in the newborn group (without osteotomy) is confirmed for the delayed CPRE girls in our current study. The delay of CPRE to approximately 2-months of age was made and this led us to divide the girls into newborn (≤ 2-months of age) and postnatal (≥ 2-months of age) repair subgroups.

Conclusions: The absolute absence of retention in the newborn group (without osteotomy) is confirmed for the delayed CPRE girls in our current study. The delay of CPRE to approximately 2-months of age was made and this led us to divide the girls into newborn (≤ 2-months of age) and postnatal (≥ 2-months of age) repair subgroups.
Primary Non-Refluxing Megaureter: Analysis of Risk Factors for Spontaneous Resolution and Surgical Intervention

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Introduction: The risk of febrile urinary tract infection (fUTI) in primary non-refluxing megaureter (PM) patients has been extensively studied in the literature, however, a paucity of information exists regarding risk factors for surgical intervention and spontaneous resolution. Therefore, we sought to analyze data from our prospective PM cohort to determine risk factors that would predict surgery and resolution in this population.

Materials & Methods: Patients with PM were identified from our prospectively collected prenatal hydronephrosis (HN) database from 2008-2016. Primary outcomes included surgery intervention and resolution of ureteral dilation. Resolution was defined as ureteral dilation < 7 mm at last follow-up. Age at presentation, gender, development of fUTI, HN grade [low(SFU I/II) vs. high(SFU III/IV)], anteroposterior diameter (APD) measurements and ureteral dilation at baseline and last follow-up were recorded. Univariate and multivariable analyses (binary logistic and cox regressions) were performed to identify risk factors for surgery and spontaneous resolution.

Results: Of 101 patients, 86 (85%) were male, and 80 (79%) had high grade HN. Median age at baseline and last follow-up were 2 (0-23) and 29 (2-107) months, respectively. Overall, 23 (23%) patients underwent surgery at a median age of 22 (3-35) months. Mean ureteral diameter was larger in surgical patients versus those treated non-surgically (14+4 mm vs.11+3 mmp < 0.01). Of the 78 (77%) non-surgical patients, 43 (55%) showed resolution of their ureteral dilation at a median age of 24 (4-56) months. Survival analysis demonstrated that 12 patients resolved by year 1, 22 by year 2, 30 by year 3, 40 by year 4, and 43 by year 5. However, when considering resolution as APD < 10 mm, 62 (79%) children resolved their HN by last follow-up (29 months). Univariate and multivariable analyses (Table 1) revealed that high-grade HN at baseline, development of fUTI, and ureteric dilation ≥14 mm were significant risk factors for surgical intervention. Cox regression (Figure 1) found that ureteral dilation < 15 mm was the only independent risk factor significantly associated with PM resolution (Table 2).

Conclusions: PM children with high-grade HN, ureteral dilation ≥ 14 mm and fUTI were at a significantly higher risk of undergoing surgical treatment, and those with ureteral dilation < 11 mm were more likely to resolve spontaneously within 24 months.

A Sock Option: Compressive Externally Applied Stockings for Enuresis (CEASE Study)

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Introduction: Primary nocturnal enuresis is a common condition which frustrates pediatric patients and their parents. There are many treatment options to accelerate resolution, which may be intrusive (alarm systems, acupuncture), expensive (hypnotherapy, medications), or seem to pose unacceptable risks for a benign, self-limiting condition (medication adverse reactions). The authors examined a novel intervention which is simple, cheap and without serious side-effects. The CEASE study explores the sequential use of compressive stockings in confirmed enuretic patients to decrease the number and volume of wet episodes associated with nocturnal enuresis.

Materials & Methods: Consecutive children between 6-12 years of age with a history of nocturnal enuresis were recruited from a single institution from November of 2015 to October of 2016. Inclusion criteria included primary nocturnal enuresis with a minimum of 3 urination events per week. Patients with less than 3 events per week or secondary enuresis were excluded. Patients were monitored over an 8 week baseline period with a calendar to confirm enuresis frequency. If the child qualified, they were given compressive, size-appropriate soccer stockings to wear at night and were asked to record their results over the subsequent 8 week intervention period. Patients were given a quality of life evaluation at the beginning, and again after a long term follow up at 24 weeks. Medication or alarm therapies were allowed to continue. Descriptive statistics and paired samples t-tests were calculated to compare the number of wet nights between the baseline and intervention periods. Results were analyzed using IBM SPSS 23.

Results: A total of 71 patients met inclusion criteria and continued the study to completion. 71% (n=50) were male, and 73% (n=52) were age 8 or younger. There was a significant difference between wet nights during the baseline period (M=49.3, SD=7.86) and the intervention phase (M=43.17, SD=13.63, t (63) = 4.96, p < .001 (Frequency distribution of wet nights during each study period featured in Figure 1). Thus, there was an average reduction in 6 wet nights between the baseline period and the intervention phase: 95% CI (3.66, 8.99). Parents reported a significant decrease in volume in 25% of cases (n=18) during the intervention period. Furthermore, 59% of patients (n=38) reported some extent of reduction in wet nights, 21% reported no change (n=15), and 16% (n=11) reported an increase (see Figure 2).

Conclusions: Nighttime compressive stockings are a safe and appealing strategy for families hoping to reduce the morbidity of primary nocturnal enuresis while minimizing the expense, burden and side effects of more traditional interventions. The authors found a statistically and clinically significant benefit.
DSD Management: Balancing Patient Self-Determination with Parental Preferences
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Introduction: A central ethical dilemma in management of the patient with a disorder of sex development (DSD) is the potential conflict between respect for the fundamental right of the child for physical and emotional integrity and self-determination and the right of parents to serve as surrogate decision-makers and act in their child's best interest. Often decisions must be made on incomplete information before it is possible to ascertain the child's self-identified gender.

Materials & Methods: Over the past 2 years we have encountered 3 complex DSD cases on the spectrum of mixed gonadal dysgenesis to ovotesticular DSD in which gender assignment, and therefore optimal surgical management was uncertain. All patients had mosaic karyotypes with Y chromosomes, dysgenetic ovary and dysgenetic testis, a urogenital sinus and prominent phallus (Table 1). In all 3 cases a team (Endocrinology, Urology, Psychology, Ethics) approach was taken to assess functional potential and risks along either gender pathway and to develop a spectrum of treatment options for parental consideration, including:

1. Feminization of male phenotype (+/- bilateral gonadectomy)
2. Initial vaginoplasty but with retention of the phallus (+/- bilateral gonadectomy)
3. Initial vaginoplasty with "burial" of corporal bodies (Pippi Salle procedure)
4. Vaginoplasty and clitoroplasty (with bilateral gonadectomy)

Consideration, including:

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4. Vaginoplasty and clitoroplasty (with bilateral gonadectomy)

Results: In all 3 cases, after consideration of risks and benefits (Table 2) of all options, parents selected option 2: gonadectomy to eliminate tumor risk and vaginoplasty, taking advantage of the child's young age to preserve urinary and reproductive tracts to avoid incongruence and infection and supporting parental bias toward female gender, but preservation of phallic structures to insure a male option should the patient later declare a male gender identity. Conclusions: In the setting of exposure of the neonatal brain to testosterone, vaginoplasty and phallic preservation afforded a balance between parental preferences and preservation of anatomic options, allowing potential reconstruction of male or female phenotype as gender identity is ascertained thereby respecting both parent and patient rights.

Transversus Abdominis Plane (TAP) Catheters versus Intraoperative Regional Field Infiltration in Reducing Postoperative Opioid Requirements in Children Undergoing Renal Transplantation: A Retrospective Age-Matched Comparison
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Introduction: After renal transplantation, children often exhibit large opioid requirements, which leads to significant side effects and complications. To address this problem, we introduced the use of transversus abdominis plane (TAP) catheters with continuous postoperative local anesthetic (bupivacaine) infusion, placed under direct vision at the time of RT. Herein, we present a retrospective study of the effectiveness of this novel approach as part of a multi-modal pain management strategy.

Materials & Methods: The intra-operative procedure involved ipsilateral deployment of 3-hole epidural catheters between the internal oblique and transversus abdominis muscles, at one or two different locations along the Gibson incision, following the direction of the nerves. Postoperative opioid utilization (mg/kg) for the first 24 hours (Day 1), second 24 hours (Day 2), third 24 hours (Day 3), and total dose was obtained from 100% pediatric renal transplant recipients. Postoperative opioid use was compared between children who underwent renal transplantation managed with two TAP catheters at two locations with local anesthetic infusion (Double TAP; n=57), one TAP catheter at one location with local anesthetic infusion (Single TAP; n=50), or local anesthetic infusion only (Control; n=46).

Results: The Double TAP group demonstrated significantly decreased postoperative opioid use compared to the Control group for Day 1, Day 2, and total dose (p<0.0001) (Figure 1). The Double TAP group also demonstrated significantly decreased use compared to the Control group for Day 1, Day 2, Day 3, and total dose (p<0.0001) (Figure 1). The Double TAP group also demonstrated significantly decreased use compared to the Single TAP arm for Day 1, Day 3, and total dose (p<0.0001). No significant differences were found between the Single TAP and Control groups (p>0.05). No major adverse events were reported.

Conclusions: Our data demonstrates that the novel use of dual ipsilateral TAP catheters with local anesthetic infusion significantly lowers mean opioid utilization after pediatric RT when compared to single TAP catheters with local anesthetic and local anesthetic only controls.
What are the Implications for Obtaining VCUG for All Infants with High Grade Prenatal Hydronephrosis?

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Introduction: Voiding cystourethrogram (VCUG) is often recommended for infants with Society for Fetal Urology (SFU) grade III/IV prenatal hydronephrosis (HN) and/or those with dilated ureters. A recent survey reported lack of uniformity in this practice, particularly for patients without prior history of uroinary tract infections (UTIs). Herein we evaluate the yield of vesicoureteral reflux (VUR) detection and determine the risk of subsequent UTIs, to explore the value of this diagnostic practice and merit for routine, universal request for all cases.

Materials & Methods: We reviewed our prospectively-collected prenatal HN database of patients 0-24 months from 2008-16 (n=571), selecting those with SFU III/IV HN and/or ureter dilation and no history of UTI, who underwent VCUG according to our institutional protocol. We excluded children with associated uropathies and those with previous UTI (n=262). Children were segregated in 2 groups (those with hydronephrosis/obstructive HU(N) (under diameter ≥7mm) and those with isolated HN) and then further stratified by VUR status (present or not). Outcomes included rates of UTI and subgroup analysis on the rate of VUR in patients with unilateral vs. bilateral HN. Univariate analyses were conducted and stratification was employed for controlling for confounders.

Results: Of 245 patients, median age at presentation was 2 months (0-21), 193(79%) were male, 372(66%) had isolated HN and 88(54%) had HU(N). Median follow-up time was 28±21 months. In the isolated HN group, 82% had unilateral dilation and 11% of those had VUR compared to 10% in those with bilateral HN (p=0.02). For children with HU(N), 78% had unilateral dilation and 27% of those had VUR compared with 52% in patients with bilateral dilation (p=0.03). There was a significant difference in continuous antibiotic prophylaxis (CAP) use between infants with isolated HN and HU(N)/42% vs. 57% p=0.02). When we compared rates of UTI, we noted that there was no difference between isolated HN vs. HU(N) (4% vs. 4%)6) as well as between infants with VUR vs. those without, regardless of etiology(10% vs. 7% p=0.34) (Figure 1).

Conclusions: The rate of VUR in patients with isolated HN was low (11%) compared to infants with HN (33%), however VUR was rarely associated with subsequent development of febrile UTIs in either group. Significantly more children with HU(N) received CAP, which could provide a protective effect for development of UTIs in this group. Having bilateral involvement did not increase the likelihood of diagnosing VUR in those with isolated HN; but in children with bilateral HN, the likelihood of finding VUR increased to more than 50%. Therefore, ordering VCUG solely on basis of laterality is inappropriate for children with HU(N). Based on these data, we propose that a more selective approach can be offered when determining which children with high-grade prenatal HN should be investigated with VCUG and those who would benefit from CAP.

A Single-Institution Series of Perioperative Outcomes Following Robotic Redo Pyeloplasties

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Introduction: Recurrence after pyeloplasty occurs in around 3% of cases. Revision after a failed pyeloplasty can be more complex due to increased inflammation and scarring. For this reason, it is unclear whether a robotic approach is preferable for these difficult reconstructive cases. Understanding the outcomes following redo RALP will help counsel families regarding the best approach for a revision procedure. As such, we aim to describe in detail perioperative outcomes following redo RALP.

Materials & Methods: We performed a single-institution retrospective case series of our redo RALPS cases between 2007 and 2014. We focused on perioperative outcomes, including operative time (OT), length of stay (LOS), complications, readmission, recurrence and improvement. Patient and procedure level characteristics were summarized using frequencies (percentage) and medians (range or IQR) for categorical and continuous variables, respectively.

Results: Twenty-four redo RALPS were performed in 22 patients; 2 patients had 2 redo RALPS and were analyzed individually. A majority of patients were healthy (ASA scores 1-2); White (55%) boys (77%) with a left-sided obstruction (72%). Median age at initial pyeloplasty was 4.2 years (IQR 1.1-7.4), compared to 7.2 (IQR 2.5-10.9) at redo. The median time from initial pyeloplasty to redo was 1.55 years (IQR 1.1-3.5). Nine patients were decompressed via stent or PCN prior to redo RALP and the median function of the kidney was 4.7 (IQR 3.6-5). One patient had a concomitant nephrectomy. Median LOS was 1 day (range 1-3) and OT was 178 minutes (IQR 165-207). During follow up (median 1.9 years IQR 1.4-2.7), 3 complications (21%) occurred in 4 patients: a pseudomonal febrile UTI after stent removal, stent migration requiring endoscopic repositioning, and 3 recurrent stenoses. The complications were associated with 2 ER presentations, 3 admissions, 1 nephrectomy and 2 redo RALPS. Both patients improved repositioning, and 3 recurrent stenoses. The complications were associated with 2 ER presentations, 3 admissions, 1 nephrectomy and 2 redo RALPS.

Conclusions: The robotic approach for managing complex repairs after a failed primary pyeloplasty can be performed efficiently, with a short LOS, and provide good clinical improvement. However, complication rates are notable. Providers can use this information to counsel families when redo pyeloplasty is necessary.

Active Surveillance is a Viable Option for Men Under 60 Years of Age with Low-Risk Prostate Cancer

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Introduction: Active surveillance (AS) is increasingly used in managing low-risk and favorable intermediate-risk prostate cancer. While most centers do not have a strict age criterion for AS in older men, younger men are typically counseled to undergo definitive treatment. However, there is limited data on the outcomes of AS in younger men. Here, we evaluate the role of active surveillance for men under 60 years of age diagnosed with low-risk prostate cancer.

Materials & Methods: We retrospectively reviewed two prospective institutional AS cohorts of men diagnosed with low-risk prostate cancer between 1990-2016 (n = 2152) to identify 432 men who began AS before 60 years of age. Clinical outcomes were analyzed, including repeat biopsy data, progression to treatment, and pathologic staging in those who had surgical treatment. Survival analyses for treatment-free survival, metastasis-free survival, cancer-specific survival, and overall survival were conducted using the Kaplan-Meier method.

Results: At diagnosis, median age was 59 years (IQR 53-57) and median PSA was 4.6 ng/mL (IQR 3.1-5.9), with only 11 of 432 men with PSA ≥10 ng/mL. The vast majority of patients had Gleason ≤6 (97.7%) and clinical stage T1 (91.9%) disease. With a median follow-up of 5.1 years (range: 0.05-21.7; IQR: 3.1-8.4), 84.3% (364/432) had a repeat biopsy with 62.6% (228/364) showing prostate cancer, 24.3% (89/364) benign, 7.7% (28/364) with PIN, and 5.2% (19/364) with atypia. Kaplan-Meier actuarial treatment-free survival was 74.3% at 5 years and 55.4% at 10 years. Of all 432 patients, 131 (30.3%) progressed to treatment for the following reasons: pathologic progression (64.6%), PSA progression (18.3%), patient preference (11.5%), volume progression (3.1%) and other reasons (3.1%). Involvement of the following reasons: pathologic progression (64.6%), PSA progression (18.3%), patient preference (11.5%), volume progression (3.1%) and other reasons (3.1%). Involvement of

Conclusions: Active surveillance is a viable option for carefully selected men under 60 with low-volume, low-risk prostate cancer. However, patients must be surveyed closely and understand the significant risk of ultimately needing treatment.
Treatment Trends for Metastatic Prostate Cancer over the Last Decade: Insights from the National Cancer Database

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Introduction: The incidence of metastatic prostate cancer has been increasing over the past decade. The landscape of treatment options has changed over this time period with the addition of new approaches to treatment, including the immunologic agent sipuleucel-T (approved in 2010), and the chemotherapeutic agent docetaxel, for which level 1 evidence is lacking. To minimize reporting bias, only hospitals contributing at least one case per year for the entire decade were included. Descriptive statistics were performed in Stata.

Results: A total of 49,586 cases were included. The percentage of patients opting for surgical intervention as a care component (mostly palliative TURP) decreased over time, from 24% in 2004 to 16% in 2014. Likewise, there has been a slight decrease in utilization of all forms of radiation therapy with 25% receiving radiotherapy in 2004 compared to 18% in 2014. The use of hormone therapy has increased significantly over the last decade (from 5.6% in 2004 to 11.5% in 2014). Use of hormone therapy has increased significantly over the last decade (from 5.6% in 2004 to 11.5% in 2014). Use of hormone therapy has increased significantly over the last decade (from 5.6% in 2004 to 11.5% in 2014).

Conclusions: The treatment landscape for prostate cancer has changed dramatically over the last 10 years. Primary treatment plans are less likely to include radiation or surgical intervention, as one would expect given that local control is uncommonly recommended in the context of metastatic disease. The usage of hormone therapy continues to rise. Use of immunotherapy with sipuleucel-T remained relatively low in 2014. The incidence of metastatic prostate cancer has been increasing over the past decade, with significant heterogeneity between estimates derived from controlled studies and case-control studies identified. Overall cognitive impairment has been increasing over the past decade, with significant heterogeneity between estimates derived from controlled studies and case-control studies identified. Overall cognitive impairment has been increasing over the past decade, with significant heterogeneity between estimates derived from controlled studies and case-control studies identified.
Clinical and Socioeconomic Disadvantaged Socioeconomic Status is Strongly Associated with Metastatic Prostate Cancer
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Introduction: Despite clear evidence demonstrating the benefit of periprostatic aspirin use in reducing the risk of cardiac and cerebrovascular complications, ASA is commonly discontinued before surgery due to a concern for surgical bleeding. To date, there exists a paucity of studies assessing the effect of periprostatic ASA on surgical outcomes within urology. The majority of those available investigations are limited to high volume centers, which may not be reflective of the general urologic community practice. As a result, we sought to evaluate the impact of periprostatic ASA on outcomes for those undergoing radical prostatectomy (RP) across a broad range of practice settings.

Materials & Methods: A retrospective review of patients undergoing RP (ICD9 60.5, 60.62) from 2008-2013 was performed on the Premier Hospital Database (Premier Inc., Charlotte NC, USA), a nationally representative hospital discharge database. We restricted the study to elective procedures with a diagnosis of prostate cancer (ICD 185), and excluded patients with a possible cardiovascular or cerebrovascular event on the day of surgery. To reduce unmeasured confounders, we limited the cohort to hospitals that - during the course of study - had at least one patient that received periprostatic aspirin yielding a total cohort of 159,674 patients. The cohort was dichotomized into two groups: those receiving periprostatic ASA n= 88,596, those with no or 1 day withhold n=71,078. Using propensity scores, we assessed in-hospital rates of: major bleeding, overall transfusion, day-of-surgery transfusion, prolonged (>2 days) length of stay (LOS), and prolonged (>270 minutes) operative time. We also assessed 90-day rates of myocardial infarction, cerebrovascular accident, readmission, major complication (Clavien-Ontdo ≥ 3), deep vein thrombosis/pulmonary embolism, and death. The statistical analysis was based on crude and adjusted logistic regression models, which accounted for patient and hospital, and surgical characteristics.

Results: Patients continuing with periprostatic ASA tended to be older (51.5% vs. 41.8% ≤ 65 years, p < 0.002), less healthy (23.8% vs. 5.2% with a Charlson Comorbidity Index score ≥ 2, p < 0.0001), and more likely to receive an open RP (42.3% vs. 28.1%, p < 0.001). With respect to in-hospital outcomes, no significant differences were associated with the use of periprostatic ASA. For 90-day outcomes, those patients receiving periprostatic ASA were more likely to suffer a myocardial infarction (OR 5.88, CI [3.4-10.18], p < 0.001), experience a major complication (OR 2.95, CI [1.56-5.5], p < 0.001), or be readmitted (OR 1.57, CI [1.18-2.06], p < 0.05). Subgroup analysis showed that the disparity in morbidity was limited to patients undergoing minimally invasive RP.

Conclusions: This contemporary, population-based study demonstrates that periprostatic ASA is not associated with increased in-hospital surgical morbidity following RP. Although these findings suggest that patients on periprostatic ASA do not have an elevated risk for bleeding, they are associated with higher 90-day morbidity, which is likely attributed to their baseline comorbidities.

V. A. Multi-Institutional Prospective Study Confirms the 4Kscore Test Predicts Aggressive Prostate Cancer Stephen M. Zappala, MD, Sanej Punnen, MD, Stacy Leb, MD, Edward Uchio, MD, Stephen Freedland, MD, Thomas Polascik, MD, Stephen Savage, MD, Shandil Mathur, MD, Michael Long, MD, Yan Dong, PhD, Jonathan Silberstein, MD

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Materials & Methods: Men were prospectively enrolled from eight VA locations. All men referred for prostate biopsy and underwent phlebotomy for 4Kscore prior to biopsy. Data was analyzed for discrimination, calibration, and clinical utility of the 4Kscore for predicting Gleason 7 or higher (G7+) CaP, and compared to a base model consisting of age, digital rectal exam findings, and PSA. Additionally, the 4Kscore test was compared amongst African-American (AA) and non-AA men.

Results: 803 men were enrolled and 366 had both 4Kscore and complete data available. Among these, 208 (56%) were AA, and 134 (36%) had G7+ CaP. The 4Kscore exhibited better discrimination (AUC 0.81 vs. 0.74, p = 0.04) and higher clinical utility on decision analysis than the base model. 4Kscore Calibration plots of for the entire cohort affirmed predictions that closely matched the observed risk of G7+ CaP in the population. No difference in the discrimination of the 4Kscore test between AA and non-AA men (0.80 vs. 0.84, p = 0.32) was seen. Because of the inherent higher risk for aggressive prostate cancer in African American men, a prospectively defined factor for modification of the 4Kscore weight was applied. The 4Kscore test accurately predicted aggressive prostate cancer and outperforms standard clinical information for biopsy decision making in both AA and non-AA men.

Conclusions: The 4Kscore test accurately predicts the likelihood of aggressive prostate cancer and outperforms standard clinical information for biopsy decision making in both AA and non-AA men.
Outcomes of Serial MRI-Fusion Biopsy in Men with Low-Risk Prostate Cancer Managed with Active Surveillance

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Introduction: Although targeted multi-parametric MRI (mpMRI) - ultrasound (US) fusion biopsy has demonstrated improvements in diagnostic yield compared with standard systematic biopsy, the outcomes of repeated biopsy among men with clinical low-risk prostate cancer (cPCa) managed with active surveillance (AS) has not been clearly defined.

Materials & Methods: We queried a single institution prospectively collected database of patients undergoing mpMRI fusion biopsy to identify patients on AS with at least two fusion biopsies. AS inclusion criteria included any volume of Gleason (Gleason) 3+3 PCa and a PSA ≤ 15. The primary study endpoint was the occurrence of GI upgrading on subsequent biopsy. For patients with GI upgrading, mpMRI changes were documented only if PI-RADS suspicion score data was available. The chi-square and independent samples t-test were used to compare categorical and continuous variables, respectively, and assess associations with biopsy upgrade.

Results: Between December 2013 and November 2016 there were 209 patients on AS who received a mpMRI/US fusion targeted biopsy. Of these, 20.5% (43/209) had at least two targeted biopsies. The average time between biopsies was 15 months. Initial clinical stage IIIc disease was documented in 98% (38/43), while 12% (5/43) were clinical stage T2a. Median age was 62 years, (interquartile range (IQR), 59-66), median (IQR) PSA and PSA density was 4.7 (3.8-6.9) and 0.10 (0.06-0.15), respectively. There were 24% (10/43) of patients who had GI ≥ 7 PCa detected on subsequent biopsy. Of these 80% (8/10) were upgraded to GI ≥ 4 disease, while two patients had GI ≥ 4+3+3+3 PCa. 50% (5/10) of patients were upgraded on both systematic and targeted biopsy, 30% (3/10) upgraded with only systematic biopsy, while 20% (2/10) were upgraded with only targeted biopsy. For patients who had biopsy upgrade, PI-RADS data were available in 5 cases. Of these, 60% (3/5) were found to have associated mpMRI upgrading. Of patients with GI upgrading, 50% (5/10) went on to receive curative treatment. For patients with GI upgrading, mpMRI changes were documented in 20% (2/10) were upgraded with only targeted biopsy. For patients who had biopsy upgrade, PI-RADS data were available in 5 cases. Of these, 60%, (3/5) were found to have associated mpMRI upgrading. Of patients with GI upgrading, 50% (5/10) went on to receive curative treatment.

Conclusions: In our initial experience with repeat mpMRI/US fusion targeted biopsy in the AS setting, we found that 24% of patients had GI upgrading on subsequent biopsy. Of these patients, only 50% had concordant findings between targeted and systematic biopsy, with 20% and 30% detected with either targeted or systematic biopsy alone, respectively. MR-MRI upgrading did not predict GI upgrading, and a clear role for systematic biopsy was noted.

Outcomes of Serial MRI-Fusion Biopsy in Men with Low-Risk Prostate Cancer Managed with Active Surveillance

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Introduction: The Canadian Journal of Urology™; 24(5); October 2017

Materials & Methods: All patients that underwent emergent urinary tract decompression for septis and an obstructing stone underwent urgent urinary tract decompression. Following this, patients were hospitalized for hemodynamic support and broad spectrum antibiotics. Urine culture results are used to tailor outpatient antibiotic therapy. At times patients achieve early clinical stability but remain hospitalized while awaiting antibiotic sensitivities. We sought to identify predictors of antibiotic resistance that may allow clinicians to select candidates for discharge on empiric oral antibiotics prior to culture results being available.

Results: 134 patients were identified that met inclusion criteria. Eighty-four patients (62.7%) had urine cultures with antibiotic resistance. Comparison was made between patients with pathogenic and resistant urine cultures (Table 1). Patients with resistant cultures were more likely to have had previous urologic surgery (44.7% vs. 22.0%, p = 0.008) - the most notable difference was in patients that had previous urologic surgery (44.7% vs. 22.0%, p = 0.008). Those with resistant cultures were more likely to require postoperative ICU-level care (23.1% vs. 12.0%, p = 0.039), have bacteremia (48.2% vs. 24.0%, p = 0.009) and a longer length of stay (5.4 vs. 3.4 days, p = 0.028). Resistance patterns were noted to be similar between the two institutions (Table 2).

Conclusions: Patients that have had previous urologic surgery, especially uroscopy, appear to be poor candidates for early discharge on empiric antibiotics prior to the completion of urine culture results due to a higher likelihood of having antibiotic resistance. These results were noted to be consistent at both institutions participating in this study.

Table 1. Differences in demographic and clinical factors between patients with resistant and non-resistant urine cultures

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Resistant Cultures</th>
<th>Non-Resistant Cultures</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>65 (59-70)</td>
<td>62 (56-67)</td>
<td>0.82</td>
</tr>
<tr>
<td>PSA (ng/mL)</td>
<td>9.2 (6.5-12.1)</td>
<td>7.3 (4.9-9.9)</td>
<td>0.07</td>
</tr>
<tr>
<td>Stage</td>
<td>T3a (75%)</td>
<td>T2b (25%)</td>
<td>0.56</td>
</tr>
<tr>
<td>PSA Density</td>
<td>0.14 (0.08-0.20)</td>
<td>0.11 (0.06-0.16)</td>
<td>0.10</td>
</tr>
<tr>
<td>Urology History</td>
<td>67.6%</td>
<td>32.4%</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 2. Antibiotic resistance patterns noted by institution.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Institution 1</th>
<th>Institution 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone</td>
<td>98.8%</td>
<td>89.9%</td>
<td>0.001</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>81.6%</td>
<td>59.4%</td>
<td>0.03</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>46.2%</td>
<td>69.4%</td>
<td>0.005</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>32.4%</td>
<td>21.8%</td>
<td>0.005</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>15.6%</td>
<td>14.0%</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Patient Navigation and Its Association with Treatment Selection for Low-Risk Prostate Cancer

Gyan Pareek, MD1, Timothy Tran, MD1

Introduction: Patient navigation (PN) has many theoretical and reported benefits in cancer care, including improved access to and coordination of care. In 2009, our large multi-institution health system developed a PN program to achieve these goals and to promote patient-centered decision-making in treatment of prostate cancer (PCa) by an independent entity facilitating consults between multiple disciplines, educating patients and families based on NCCN guidelines, and focusing on shared decision making in treatment discussions. This may reflect changing practice patterns, as well as community perception as active surveillance became more common over the study period. This study demonstrates that navigation services may help to increase active surveillance for low-risk disease. More research is necessary to evaluate long-term patient satisfaction with active surveillance.

Materials & Methods: Data were collected from our Multi-institution tumor registry from 2009 to 2015. Patients with unknown staging, node positive, and metastatic disease were excluded. A subset of patients with NCCN very-low/ low-risk disease were extracted (clinical stage ≤ T2a, Gleason score ≤ 6, serum PSA < 10 ng/mL). Multivariable logistic regression analyses were performed to determine factors associated with decision to use active surveillance as initial treatment modality for men with low-risk prostate cancer managed with active surveillance (AS). Only variables with p ≤ 0.1 in univariate analyses were included. Multicollinearity analyses were performed to determine factors associated with decision to use active surveillance. This may reflect increased decision support provided by the clinical patient navigator, who acts as an independent entity facilitating consults between multiple disciplines, educating patients and families based on NCCN guidelines, and focusing on shared decision making in treatment discussions. This may reflect changing practice patterns, as well as community perception as active surveillance became more common over the study period.
A Randomized Controlled Trial of Prophylactic Antibiotics Prior to Percutaneous Nephrolithotomy in the Low Risk Population: A Report from the EUROLITHS Consortium

Introduction: Single institution studies have suggested possible benefit of a week of pre-operative antibiotics prior to percutaneous nephrolithotomy (PNL). Yet prior studies are limited by low-risk methodology (Level Ib), including heterogeneous populations, or utilizing quasi-sepsis definitions. Other than the recommended peri-operative dose of IV antibiotics < 24 hours prior to PNL Best Practice Statement, the duration/benefit of pre-operative antibiotics remains unclear. We sought to perform a rigorous (adhering to CONSORT guidelines) multi-institutional trial assessing utility of pre-operative PNL antibiotics for patients at low risk of infectious complications.

Methods & Materials: We performed a randomized controlled trial (RCT) coordinated across 7 academic stone centers for low risk PNL patients. Low risk patients were defined as having no previous urolithiasis, no infection within 2 weeks of procedure, and no urinary drainage catheter or stent. Patients randomized to the intervention arm received nitrofurantoin 100 mg twice daily for 7 days preceding surgery. All enrolled patients received standard peri-operative dose of vancomycin (ampicillin if allergic) and gentamicin (ceftriaxone if cef < 60 or allergic). PNL was performed per the usual practice of each treating surgeon. Baseline patient and stone characteristics were recorded. Perioperative infection related adverse events within 7 days were compared between the 2 groups.

Results: Thirty-four patients were randomized to each arm. Adverse events occurring within 7 days was similar between the groups. Two patients in each arm were diagnosed with severe urinary tract infections (UTIs) within 7 days of the procedure. There was no difference in operative length (133.2 vs. 124.9 minutes, p = 0.52). For Group 1, total average hospital stay demonstrated no difference between the two groups (1.9 vs 1.47, p = 0.2). There was no mortality recorded in this study period.

Conclusions: There appears to be no advantage to providing one week of pre-operative oral antibiotics in patients at low risk for infectious complications. Less than 24 hours peri-operative antibiotics as per AUA Best Practice Statement appears sufficient. We continue to analyze this low risk group with a more robust data set, as well as analyze preoperative antibiotic benefit in other stratified risk groups.

A Decision Analysis of Observation vs. Immediate Re-Intervention for Asymptomatic Residual Fragments < 4 mm following Ureteroscopic Lithotripsy

Introduction: To assess the cost-effectiveness of observation vs. intervention on asymptomatic residual fragments less than 4 mm in diameter following ureteroscopic laser lithotripsy using a decision analysis model.

Methods & Materials: Outcomes data from a retrospective analysis evaluating the natural history, complications, and re-intervention rates of asymptomatic residual stone fragments identified by the EUROLITHS consortium were used. A decision analysis model was constructed to compare the costs and outcomes of observation vs. immediate intervention. Costs for the observation arm consisted of ED visits, hospitalizations, and re-interventions. The cost-analysis model extended for 3 years to account for delayed re-intervention rates on fragments of this size. For the immediate intervention arm, costs for ureteroscopy and shockwave lithotripsy were accounted and weighted depending on actual usage. Expected value calculations and sensitivity analyses were performed to determine the optimal treatment pathway based on overall cost-effectiveness inclusive of equipment, secondary costs from complications, emergency department visits, hospital readmission, and re-interventions. Costs of emergency department visits, readmissions, and re-interventions were calculated based on published figures from the literature.

Results: Two hundred thirty-two patients were found to have asymptomatic residual fragments < 4 mm on follow-up imaging following ureteroscopic lithotripsy. There were 197 patients in the observation group (7.9% readmissions) and 35 patients in the intervention arm (11.5% re-interventions). However, when comparing initial observation to immediate re-intervention, the cost was $2892 vs. $4594, respectively. The difference in cost was largely driven by the fact that over 3 years, approximately 56% of patients remain asymptomatic and thus incur no ED visit, hospitalization, or re-intervention costs. This represents an approximate annual per patient savings of $531, and $1539 over three years when observation is selected over immediate re-intervention.

Conclusions: Our decision analysis model demonstrates superior cost-effectiveness for observation over immediate re-intervention for asymptomatic residual stones < 4 mm following ureteroscopic lithotripsy. The cost savings and reduced burden of a potential burden of a second procedure can be observed. Based on these findings, careful stratification and selection of patients may enable surgeons to optimize the cost-effectiveness of managing small, asymptomatic residual fragments following ureteroscopic lithotripsy.
Significant Cost Savings and Decreased Patient Morbidity Analysis of Stent Omission After Uncomplicated Ureteroscopic Lithotripsy Shows Jacques M. Speed, MD, Ye Wang, PhD, Jeffrey J. Leoon, MBBS, MPH, Tyler R. McIntosh, MD, MS, Naseem Bhogani, MD, Quoc-Dien Trinh, MD, Steven L. Chang, MD, MS, Rusljan Korets, MD
1Brigham and Women’s Hospital, Boston, MA 2University of Montreal, Montreal, QC, Canada, 3Veterans Affairs Boston Healthcare System, Harvard Medical School, Boston, MA

Introduction: Percutaneous nephrolithotomy (PCNL) is an effective minimally invasive technique for removal of large upper urinary tract calculi. The initial step in percutaneous nephrolithotomy is access to the renal calyceal system via a percutaneous approach. Historically, interventional radiologists have obtained renal access; however, urologist-acquired access is feasible and appropriate in most cases. The aim of the study was to examine temporal trends of renal access by physician specialty, and to evaluate the impact of the specialty of the physician obtaining access on length of stay (LOS), complications, and costs of PCNL.

Materials & Methods: We used data from a national hospital discharge database to identify patients who underwent PCNL between 2003-2015. Procedure codes related to renal access were linked to physician specialty. We examined patient demographics, Charlson comorbidity index, postoperative complications, LOS, and direct hospital costs. We also investigated hospital and surgeon characteristics stratified by specialty of the physician obtaining renal access. Logistic regression was used to identify trends in access acquisition. A multivariable regression model was created adjusting for potential confounders to examine complications, costs, and LOS.

Results: We identified 19,976 patients undergoing PCNL between 2003-2015. The proportion of urologist-obtained access increased over time (Figure 1) with 9.8% of patients having percutaneous renal access attained by urologists in 2003, compared to 24.3% in 2015 (p for trend < 0.001). High volume urologists were more likely to obtain their own access (36.5% vs. 9.7% p < 0.003). Renal access by urologists was associated with a lower 90-day complication rate (15.2% vs. 17.0% p = 0.008) and lower rates of prolonged hospitalization ≥4 days (9.3% vs. 13.4% p < 0.001). On multivariable analysis, renal access by urologist was associated with lower rates of any complication (Clavien 1-5) (OR 0.86, p = 0.006), shorter LOS (<4 days) (OR 0.71, p < 0.001), and lower direct hospital costs (OR 0.83, p < 0.001).

Conclusions: In the United States, radiologists obtain percutaneous renal access in the majority of PCNLs. Though the majority of access for PCNLs continues to be done by radiologists, there is an increasing proportion of renal access for PCNL being acquired by urologists. Access by urologist may be associated with lower overall complications, shorter hospitalizations, and lower direct hospital costs. Coding errors and absence of stone complexity information may limit the cogency of our findings and requires further investigation.

Analysis of Stent Omission After Uncomplicated Ureteroscopic Lithotripsy Shows Significant Cost Savings and Decreased Patient Morbidity Paul E. Bower, MD, Danielle Velez, MD, Simone Thavaseelan, MD, Gyan Pareek, MD Brown University, Providence, RI

Introduction: Prospective trials have shown that stent placement after ureteroscopic lithotripsy (URSL) is not necessary in all patients. As the Medicare Access and CHIP Reauthorization Act of 2015 ends fee for service payment in exchange for the Merit-based Incentive Payment System (MIPS) and Advanced Alternative Payment Models (APMs) in 2017, financial analysis of URSL procedures is necessary. Specific indications for stent omission (SO) remain elusive, and the lack of clear indications may have a negative impact on the specialty of the physician obtaining access. We sought to define indications for and the cost impact of SO.

Materials & Methods: A retrospective cohort of 126 consecutive patients who had URSL or diagnostic ureteroscopy by fellowship trained endourologists were analyzed. Indications for SO were defined according to Figure 1. Phone calls for symptoms, additional office visits, ED visits or admissions within 30 days of the procedure were recorded as postoperative events. Costs for the stent removal and from events attributable to the stent were calculated using the Medicare Physician Fee Schedule Look-Up Tool. The cost of stent placement was calculated as the cost to purchase the stent. Statistical analysis was performed using Fischer’s exact test when comparing postoperative morbidity between groups.

Results: SO was indicated in a total of 67 patients of the 126 analyzed, with SO performed in 9 patients. The average cost of unnecessary stent placement was $372.45 per patient, with the average cost being $540.09 for those with events and $272.92 for those without events. Annualized cost was $29,424 per endourologist. Events occurred in 23 patients with stents that were placed unnecessarily and in no patients in which SO occurred as indicated (p = 0.025). Events included new flank pain, dysuria, hematuria, stent migration, and sedation for cystoscopic stent removal.

Conclusions: We propose evidence based indications for SO after URSL which decrease patient morbidity and generate savings of $372.45 per patient or $29,424 annually per endourologist. These cost savings may prove vital in adjusting to new payment models.
Initial Outcomes of Supine PCNL in the United States: Another Arrow for the Urologist’s Quiver
Priyanka Bearelly, MD, Sanchita Bose, MD, Jacqueline M. Speed, MD, Jerilyn M. Latini, MD, Ruanan Kenets, MD
Boston Medical Center, Boston, MA, Brigham and Women’s Hospital, Boston, MA
2Veterans Affairs Boston Healthcare System, Harvard Medical School, Boston, MA

Introduction: Percutaneous nephrolithotomy (PCNL) is a treatment of choice for complex renal calculi. Traditionally, prone position for PCNL has been the preferred approach. Valdivia was the first to describe the technique and advantages of performing PCNL in the supine position so as to minimize the risks associated with the classic prone position. Over time, the supine position has gradually gained traction in Europe, Asia and South America. However, the technique is utilized in only 1.5% of PCNLs performed in North America and to our knowledge has never been reported in the United States. The purpose of this study is to describe technique, outcomes and complications following initial implementation of supine PCNL.

Methods & Materials: Between September 2016 and March 2017, 24 patients underwent PCNL in the supine position at a New England tertiary referral center. Galdakao-modified Valdivia position was utilized for cases where concomitant contralateral uroterectomy was planned. Bar’s flank-fixed modified supine position was used for all other cases. Renal access was obtained in the operating room with fluoroscopic guidance. Patient demographics, stone characteristics, access time, total operative times, estimated blood loss, fluoroscopic time, radiation dose, stone-free rates, and complications based on the Clavien-Dindo classification system were collected. To assess the effect of the learning curve, perioperative outcomes were compared between the first and last 12 cases.

Results: Patients had a median age of 67.5 years, ASA 3, and G4’s stone score of 3. Lower pole access was used in 14 (58.3%) patients, while upper pole access was obtained in 7 (29.2%) of cases. Two patients required multiple tracts. Median operative time was 119 minutes (IQR: 108, 140) and estimated blood loss was 100 cc. In 4 patients, concomitant contralateral retrograde ureteroscopy with laser lithotripsy was performed as ureteral access was readily available. Tubeless PCNL was performed in 12 (50%) cases. No patients required blood transfusions and median length of stay was 1 day. On follow-up imaging 20 out of 24 (83%) patients were considered stone-free after surgery. Minor complications (Clavien ≤2) occurred in 2 (8.3%) patients, and 1 patient required stent placement two days after initial procedure (Clavien 3). Over time, there was significant improvement in renal access times and operative times.

Conclusions: Like most surgical procedures, an initial learning curve exists. However, for urologists familiar with percutaneous nephrolithotomy, supine position for PCNL can be easily and safely implemented into practice. Supine positioning has the benefit of minimizing risks associated with prone positioning, in patients with neuromuscular conditions, cardiopulmonary disease, and high body mass index. Additionally, it provides ease of access to the lower urinary tract as well as retrograde access to the contralateral side without need for repositioning.
P1

**Multiple Linear Regression**

Introduction: Multi-parametric MRI (mpMRI) with ultrasound fusion targeted biopsy has increasingly utilized as a diagnostic procedure for patients suspected of having prostate cancer. Several aspects of fusion biopsy require learning, including lesion targeting and the operational knowledge of the various fusion biopsy devices. As targeted biopsy gains further adoption in prostate cancer diagnostics, understanding the learning curve of the procedure will be helpful for institutions considering implementation into their practice.

Materials & Methods: We retrospectively reviewed 112 mpMRI-US fusion targeted biopsies performed at our institution utilizing the Artemis® (Fusion) fusion biopsy device. Each biopsy was performed by one of four urologists with no prior experience performing fusion targeted biopsy. Supervision was available by an attending with experience in the technique. Biopsies are performed under monitored anesthesia care or local anesthesia, with an average of 5 biopsy cores obtained from each region of interest (ROI). This is followed by a 12-core systematic biopsy using a software generated template. Operative records were used to document the primary end point of length of procedure (LOP). Time is started with insertion of ultrasound probe into the rectum and is stopped upon removal. Analysis of variance and chi-square tests were used to compare continuous and categorical variables respectively. Multiple linear regression was utilized to assess independent predictors of LOP.

Results: Overall, LOP decreased with increasing operator experience. Average LOP for the first ten cases was 29.2 minutes, standard deviation (SD) 9.4. From the tenth to the twentieth case, LOP significantly decreased to 24.9 minutes, (SD 5.3), p < 0.01. There were no significant differences in the number of ROIs detected on mpMRI by our radiologists over time (r = 0.44). Low number of ROIs and increasing biopsy experience were both significant predictors of shorter LOP (p < 0.01 for both).

Conclusions: Our study demonstrates an improvement in LOP with increasing user experience, independent of number of ROIs. In addition, the number of ROIs was shown to independently influence LOP. Although use of a new technology is associated with a steep learning curve, our study demonstrated a substantial improvement within the first twenty procedures, suggestive of basic proficiency. Additional longitudinal data may further elucidate variables associated with physician learning curve.

Poster Session I: Translational Research/Oncology

P2

**Metformin Inhibits Benign Prostatic Epithelial Cells through Suppression of Insulin-Like Growth Factor 1 Receptor**

Zongwei Wang, PhD, Xingyuan Xiao, MD, Jijun Li, MD, Massachusetts General Hospital, Boston, MA; University of Massachusetts Medical Center, Boston, MA

Introduction: Benign prostatic hyperplasia (BPH) is the most common proliferative abnormality of the prostate affecting elderly men throughout the world. Epidemiologic studies have shown that diabetes significantly increases the risk of developing BPH, although whether anti-diabetic medications preventing the development of BPH remains to be defined. We have previously found that strongly expressed insulin-like growth factor 1 (IGF-1) promotes benign prostatic epithelial cell proliferation through paracrine mechanisms. Here, we seek to understand if metformin, a first line medication for the treatment of type 2 diabetes, inhibits the proliferation of benign prostatic epithelial cells through reducing the expression of IGF-1 receptor (IGF-1R) and regulating cell cycle.

Materials & Methods: BPE cell lines BPH-1 and P69, murine fibroblasts 3T3 and primary human prostatic fibroblasts were cultured and tested in this study. Cell proliferation and the cell cycle were analyzed by MTS assay and flow cytometry, respectively. The expression of IGF-1R was determined by western-blot and immunocytochemistry. The level of IGF-1 secretion in culture medium was measured by ELISA.

Results: Metformin (0.5-10mM, 6-48h) significantly inhibited the proliferation of BPH-1 and P69 cells in a dose-dependent and time-dependent manner. Treatment with metformin for 24 hours lowered the G2/M cell population by 43.24% in P69 cells and 24.22% in BPH-1 cells. Similar results were observed in 3T3 cells. Metformin (5mM) abrogated the proliferation of benign prostatic epithelial cells induced by IGF-1. In 3T3 cells, the secretion of IGF-1 was significantly inhibited by metformin from 574.3pg/ml to 197.6pg/ml. The conditioned media of 3T3 cells and human prostatic fibroblasts promoted the proliferation of epithelial cells and the expression of IGF-1R in epithelial cells. Metformin abrogated the proliferation of benign prostatic epithelial cells promoted by IGF-1 conditioned medium.

Conclusions: Our study demonstrates that metformin inhibits the proliferation of benign prostatic epithelial cells by suppressing the expression of IGF-1R and IGF-1 secretion in stromal cells. Metformin lowers the G2/M cell population and simultaneously increases the G1/S cell population. Findings here might have significant clinical implications in management of BPH patients treated with metformin.

Funding support: NIH/National Institute for Diabetes and Digestive and Kidney Diseases (NIH/R01 DK091353) to AFO.
Sensitivity of Squamous Cell Carcinoma-Like Bladder Cancers to PI3K-Beta Inhibitor

A Novel, Integrated Gene Expression and Drug Sensitivity Approach Reveals Unique Sensitivity of Squamous Cell Carcinoma-Like Bladder Cancers to PI3K-Beta Inhibitor AZD6244

Kevin Shee, BS1, Kevin Koo, MD, MPH, MPH1, Lael Reinstatler, MD, MPH1, John Seigne, MD2, Todd W. Miller, PhD3

Geisel School of Medicine at Dartmouth, Lebanon, NH; Dartmouth-Hitchcock Medical Center, Lebanon, NH

Introduction: The goal of precision medicine is to predict the best treatment strategy from available genomic information, on a patient-by-patient basis. Bladder cancer genomics has emerged as a new area of research, whereby molecular subtypes of bladder cancer based on gene expression models may have selective therapeutic targets. Here we implement a novel bioinformatics approach integrating gene expression and drug sensitivity analyses to determine molecular subtype-specific therapeutic vulnerabilities in bladder cancer.

Materials & Methods: Gene expression profiles for 26 bladder cancer cell lines were obtained from the Cancer Cell Line Encyclopedia (CCLE) and analyzed by unsupervised hierarchical clustering using Morpheus software (Broad Institute, Cambridge, MA). Cell line clusters were classified according to validated genomic classification systems. Drug sensitivity data for 17 bladder cancer cell lines treated with 224 anti-cancer drugs was obtained from the Genomics of Drug Sensitivity in Cancer (GDSC) database (Sanger Institute, Cambridge, UK). Differential data was obtained from CCLE and GDSC. Differential sensitivity analyses were performed using GraphPad Prism.

Results: Unsupervised hierarchical clustering of gene expression data revealed major subgroups that clustered according to classified molecular subtypes: Squamous cell carcinoma-like (SCC-like), Urobasal A, Urobasal B, and Urobasal A/B (Fig 1A). Differential sensitivity analyses revealed that certain subtypes are preferentially sensitive to specific drugs. The most significant drug/subtype combination was the unique sensitivity of SCC-like cell lines to Phosphatidylinositide 3-kinase beta (PI3Kbeta) inhibitor AZD6244, compared to Urobasal A or B lines (Fig 1B; P < 0.05 by Kruskal-Wallis test). This unique sensitivity is associated with PTEN loss of function, which was found to be more commonly altered in SCC-like vs. Urobasal cell lines (p < 0.05).

Conclusions: Using cell line gene expression profiling and drug sensitivity data, we developed a novel bioinformatics approach and demonstrated a unique sensitivity of SCC-like bladder cancers to the PI3Kbeta inhibitor AZD6244, which may represent a novel therapeutic target. Furthermore, PTEN mutational status may represent a potential biomarker for sensitivity to this class of agents.

The Role of Integrins and Exosomes in Sunitinib Resistance in ccRCC Cell Lines

Jared P. Schober, MD, Marc Calabrese, MD, Daniel Kaufman, MD, Kevin Yang, MD, Kristian D. Stensland, MD, Juhla Kostas, N. A. Travis-Sullivin, MS, Kimberly Reger-Christ, PhD

Lahy Hospital and Medical Center, Burlington, MA

Introduction: Tyrosine kinase inhibitors (TKIs) are used as first line therapy for stage IV or unresectable clear cell renal carcinoma (ccRCC). While the efficacy of TKIs is attributed to downregulation of vascular endothelial growth factor and a decrease in tumor angiogenesis, tumor response is often mitigated by acquired resistance. Integrins, cell surface proteins involved in regulating cell adhesion, have been shown to promote TKR resistance in several tumor types. Exosomes are small extracellular vesicles released by cells and have been shown to horizontally transfer bioactive molecules to recipient cells thereby promoting chemoresistance. In this study we have investigated the role of integrins and exosomes in ccRCC resistance to sunitinib.

Materials & Methods: The ccRCC cell lines Caki-1 and Caki-2 were continuously exposed to increasing concentrations of sunitinib for 6-8 months until acquiring resistance. These cells were termed Caki-1/SR and Caki-2/SR. Cell viability was assessed using MTT assays. Exosomes were harvested and characterized by nanoparticle tracking analysis. Changes in the integrin expression profiles and various signaling pathways were determined using Western blot analysis of cell and exosome lysates. Alterations in adhesion were established using standard in vitro assays. Integrin inside-out signaling pathway array plates were used to compare mRNA expression levels.

Results: Integrin expression levels were found to be variable among parental and resistant ccRCC cell lines. Gene expression analysis revealed reduced levels of COL1A1 and COL1A2, components of type I collagen, in Caki-1/SR cells. Western blot analysis demonstrated a significant decrease in beta-3 integrin protein levels in Caki-1/SR compared to Caki-1 cells. An assessment of adhesion demonstrated Caki-1/SR cells exhibited decreased adhesion to several extracellular matrices, including collagen I, laminin, and fibronectin. On the other hand, Caki-2/SR cells demonstrated an increase in beta-1 and beta-3 integrins compared to Caki-2 cells. Altered levels of beta-1 and beta-3 integrins were observed in exosomes released by both Caki-1/SR and Caki-2/SR cells. Initial protein studies suggest downstream signaling pathways affected by the change in levels of integrin expression include FAK and NF-kB.

Conclusions: Our findings suggest sunitinib resistance in Caki-1 and Caki-2 cell lines is associated with integrin expression. Beta-1 and beta-3 integrin levels correlated with resistance in Caki-2 cells. Exosomal integrin levels were altered in sunitinib resistant cells. Continued investigation into the role of integrins in sunitinib resistant cell lines, including the effect of variable integrin profiles on downstream signaling pathways and their potential transference via exosomes, will improve understanding of TKI resistance in ccRCC.

Genomic Heterogeneity and the Small Renal Mass

Daiji Ueno, MD1, Marta Boeke, PhD1, Jamil S. Syed, MD1, Kevin A. Nguyen, MS1, Patrick MacGregor, MD1, Adebowale Adeniran, MD2, Peter Humphrey, MD, PhD3, Yva Klugger, PhD3, Zhourui Liu, PhD1, Harriet Kluger, MD2, Brian Shich, MD1

1Yale Department of Urology, New Haven, CT, 2Yale Department of Molecular Biophysics and Biochemistry, New Haven, CT, 3Yale Department of Pathology, New Haven, CT, 4Yale Department of Medicine, New Haven, CT

Introduction: Pre-treatment genomic characterization of the small renal mass is now feasible, however extensive tumor heterogeneity in renal cell carcinoma (RCC) may represent a barrier to widespread adoption. This concept emerged from multi-site assessment of large renal masses. We set out to evaluate genomic heterogeneity in resected small and large renal tumors to provide further insight into the limitations of this approach.

Materials & Methods: A consecutive series (n = 100) of nephrectomy specimens had 3+ regions sampled > 1 cm apart at the time of gross pathologic exam. A total of 47 small (cT1a) and 24 large (cT2+) clear cell tumors were selected for evaluation. DNA was extracted for copy number variation (CNV) of common driver alterations from the Cancer Genomic Atlas (TCGA) using an Illumina HumanCytosNLP12 array. Gene expression analysis was performed with a custom Nanostring digital RT-PCR array and analyzed with relweveAnalysis Software to characterize ccA vs ccB profiles as well as the Prolaris Cell Cycle Progression (CCP) score. Total and subclonal CNVs, CCP score, and ccA/B classification was assessed by tumor, size grouping, and individual region.

Results: A total of 23 small (cT1a) and 24 large (cT2+) tumors were analyzed. CNV and RT-PCR analysis was performed on 44 and 42 tumors, respectively, 36 of which had successful analysis of all three regions with both modalities. Overall CNV profiles were similar to the TCGA with 3p25 loss and 5q35 gain being the most common events. Large tumors more frequently had loss of Iac24 and Iac2p21 (p < 0.05), both known to influence prognosis. Total CNVs were much less frequent in smaller tumors (median 2.5 vs. 6.5, p = 0.006). Subclonal CNV events were also less common in small tumors (median 0 vs. 3, p = 0.002). Different CNV patterns emerged with specific alterations appearing more truncal and others more branch events in tumor evolution. Significant gene expression heterogeneity was observed for both CCP and ccA/B classifications. Larger tumors had significantly more variance in CCP scores (p = 0.026). ccA/B scores differed between small and large tumors with mixed ccA/B tumors being more frequently in the larger cohort (2.3 vs. 4.7%, p = 0.048). Analysis of 5 mixed tumors that had CNV events demonstrated the more aggressive B phenotype had greater CNV events (median 7 vs. 2, p = 0.011).

Conclusions: We present the largest cohort of multiregion sampling in clear cell RCC. Small renal tumors have much less genomic complexity and fewer subclonal events when compared to large tumors. For the first time, we demonstrate that ccA/ccB profiles can vary between tumors however this is much less frequent in small renal tumors. Our findings support an ongoing small renal mass trial where pre-treatment genomic characterization is performed based on a single biopsy.
Protein Expression in Urethral Lichen Sclerosus: Potential for Biochemical Identification and Early Cancer Warning

Kristian D. Stensland, MD; Jennifer A. Bennett, MD; Brendan M. Browne, MD; Ariel K. Fredrick, MD; Jaced P. Schober, MD; Travis B. Sullivan, MS; Kim M. Rieger-Christ, PhD; Alex J. Vanni, MD
Lahey Hospital and Medical Center, Burlington, MA

Introduction: Lichen sclerosus (LS) is an inflammatory condition that, when expressed in the urethra, can lead to urethral stricture disease (USD). LS is a pathologic diagnosis, but the underlying pathophysiology leading to the disease is poorly understood. Prior biochemical research has focused on cutaneous and vulvar LS, but large-scale analysis of urethral LS has not been performed. Utilizing urethral samples with and without histologically confirmed LS, we sought to identify protein expression associated with LS USD.

Materials & Methods: Urethral tissue samples from patients undergoing urethroplasty for USD were single biological samples. Tissue from non-LS structures, clinically suspected but not histologically confirmed LS structures, and other control tissues (labia, foreskin, urethra) were also identified. A tissue microarray was created with cores from each sample and immunohistochemistry for p53, Ki-67, cyclin D1, and p16 was performed. p53 and Ki-67 were scored semiquantitatively and evaluated only in the basal and parabasal cells. Cyclin D1 was considered positive if > 10% of cells were immunoreactive while p16 was positive if diffuse “block-like” nuclear staining was present in the basal cells. Data were compared by Kruskal-Wallis or Fisher’s exact test with significance of alpha = 0.05, as appropriate.

Results: A total of 170 core samples, comprising 118 (69%) pathologic LS, 8 (4.7%) clinical LS, 18 (10.6%) non-LS structures, and 26 (15.3%) control cores were assessed. p53 expression was significantly higher in pathologic LS compared to clinical LS and non-LS structures (p = 0.0018). Ki-67, cyclin D1, and p16 expression were not statistically significant (Table 1). The expression of p16, however, was only noted in pathologic LS samples.

Conclusions: Urethral LS is more likely to express p53 compared to clinical LS and non-LS structures. No difference in Ki-67 was observed among the three groups, which contrasts with increased expression previously reported in cutaneous and vulvar LS studies. Although p16 expression was not statistically significant, its expression was limited to pathologic LS samples. Given that p16 is a surrogate marker for high-risk HPV infection, close clinical follow-up for patients with p16 positive LS USD is crucial to monitor for early squamous cell lesions. Molecular analysis of LS, and examination of early and late (or acute and chronic) phases of LS, will further elucidate potential mechanisms for pathologic transitions along the theoretical pathway from normal tissue to LS.

Whole-genome Analysis of Papillary Kidney Cancer Finds Significant Non-Coding Alterations
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Introduction: Papillary renal cell carcinoma (pRCC) is the second most common subtype of renal cell carcinoma (RCC). Previous studies, focusing mostly on the protein-coding regions, have identified several key genomic alterations but have not found key driver mutations in a significant portion of pRCC. We carry out the first whole genome study of pRCC to discover triggering DNA changes explaining these cases.

Materials & Methods: We downloaded whole exome (WES) and whole genome sequencing (WGS) variation calls from 277 tumors included in the Cancer Genome Atlas (TCGA) data pRCC project. Copy number data, protein expression (RPPA), gene expression (RNA-seq), and methylation data was similarly obtained along with clinical and pathologic data. A tissue microarray was created with cores from each sample and immunohistochemistry for p53, Ki-67, cyclin D1, and p16 was performed. p53 and Ki-67 were scored semiquantitatively and evaluated only in the basal and parabasal cells. Cyclin D1 was considered positive if > 10% of cells were immunoreactive while p16 was positive if diffuse “block-like” nuclear staining was present in the basal cells. Data were compared by Kruskal-Wallis or Fisher’s exact test with significance of alpha = 0.05, as appropriate.

Results: A total of 21 MET mutations were identified in the 277 patient cohort (7.6%), with the majority of cases identified in papillary type 1 histology and in the tyrosine kinase domain. We found 14 patients that carried one risk allele of rs11762213 (G>A). Among 96 type II pRCC, 7 patients carried the A allele (allele frequency of 3.7%). Cancer-specific mortality was significantly worse in type II patients carrying the A risk allele of rs11762213 (p = 0.034, Figure 1). We did not observe a statistically significant correlation of the rs11762213 polymorphism with MET RNA expression or c-MET pY1235 levels (p > 0.1). We discovered several (8/35, 23%) potentially impactful noncoding mutations in the MET promoter and its first two introns perhaps responsible for an alternate transcript recently found to be a driver alteration. Non-coding mutations that were discovered included a G to A transition along the theoretical pathway from normal tissue to LS.

Conclusions: We elaborate on previous results on MET, discovering more somatic alterations and finding a germline SNP in this gene (rs11762213) that may impact survival for type II pRCC. Non-coding, intronic mutations were discovered including potentially impactful ones in regions associated with MET and NEAT1 implicated in cancer. Moreover, the NEAT1 mutations are associated with increased expression and unfavorable outcome. These critical mutations newly identified from scrutinizing the entire genome help complete our understanding of pRCC genomes. Our study provides valuable additional information to facilitate better tumor subtyping, risk stratification, and potentially clinical management.
P9

Urinary Expression of TIMP-1, serpinB1 and seminogelin 2 may Differentiate Those Men with Low Risk or No Evidence of Prostate Cancer from Men with High Risk or Metastatic Disease.

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Introduction: While serum PSA and other available diagnostic biomarkers can provide valuable guidance for assessing the risk of prostate cancer (PCa), limitations in accuracy persist. Novel biomarkers with improved performance characteristics are needed. Using mass spectrometry–based proteomics, we have identified three urinary proteins with significantly different expression patterns across PCA stages. This study evaluates the expression of these potential biomarkers in urine.

Materials & Methods: Urinary protein concentrations of three proteins, TIMP1, serpinB1, and seminogelin 2, were assessed via Western blot and ELISA for 160 total urine samples. Each patient group (control, Gleason 6 PCA, Gleason > 8 PCA, and metastatic PCA) had 40 samples. Urine protein was isolated using Amicon Ultra-15 Centrifugal Filter Units for Western blotting. ELISAs were performed using untreated raw urine samples. Immunohistochemistry (IHC) was performed on prostate tissue sections for all three proteins of interest.

Results: TIMP1 levels were statistically higher in control and Gleason 6 PCA urine samples than for Gleason 8 and metastatic disease (2.19 ± 1.7 vs. 2.13 ± 1.13 ng/mL, p = 0.002). Expression of serpinB1 was significantly higher in men with Gleason 6 PCA than those with high-grade Gleason > 8 PCA (0.71 ± 0.49 vs. 0.23 ± 0.33 ng/mL, p = 0.003). Metastatic PCA had significantly higher seminogelin2 concentrations in urine than healthy men (155.68 ± 74.3 vs. 81.55 ± 56.6 pg/mL, p = 0.002), and expression levels seem to rise with disease progression. IHC staining of tissue sections corroborated these findings.

Conclusions: Our results indicate differences in urinary concentrations of TIMP1, serpinB1, and seminogelin 2 across PCA stages. These novel biomarkers allowed distinction between men without prostate cancer or low-risk disease and those with high-risk or metastatic disease. These proteins represent potentially valuable non-invasive prostate cancer biomarkers and warrant further investigation.

P10

Protective Effects of Melittin on Renal Fibrosis in an Animal Model of Unilateral Ureteral Obstruction

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Introduction: Renal fibrosis is the principal pathological process underlying the progression of chronic kidney disease that leads to end-stage renal disease. Renal fibrosis is characterized by the infiltration of inflammatory cell, interstitial fibroblasts accumulation, proliferation of myofibroblasts, deposition of the extracellular matrix, and loss of renal tubule epithelial cells, which collectively lead to end-stage renal failure. Melittin is a major component of bee venom and it has anti-bacterial, anti-viral, and anti-inflammatory properties in various cell types. Many studies have examined the biological and pharmacological activities of melittin. However, the precise mechanism of melittin in ameliorating the renal fibrosis is not fully understood. Therefore, this study examined the therapeutic effects of melittin on the progression of renal fibrosis using an unilateral ureteral obstruction (UUO) animal model. Furthermore, the effects of melittin on inflammation and fibrosis in renal fibroblast cells were explored using TGF-β1.

Materials & Methods: To investigate the therapeutic effects of melittin against unilateral UUO-induced renal fibrosis, melittin was given intraperitoneally after ureteral ligation. At seven days after UUO surgery, the kidney tissues were collected for protein analysis and histologic examination.

Results: Histological observation revealed that UUO induced a considerable increase in the number of infiltrated inflammatory cells. However, melittin treatment markedly reduced those reactions compared with untreated UUO mice. The expression protein levels of TNF-α and IL-1β were significantly reduced in melittin treated mice compared with UUO mice. In addition, treatment with melittin significantly inhibited TGF-β1 and fibronectin expression in UUO mice. Immunofluorescence staining shows that melittin treatment reduces α-SMA positive cells in the kidneys after UUO. Besides, melittin effectively inhibited fibrosis-related gene expression in renal fibroblasts NRK-49F cells.

Conclusions: These findings suggest that melittin attenuates renal fibrosis and reduces inflammatory responses by suppression of multiple growth factor-mediated pro-fibrotic genes. In conclusion, melittin may be a useful therapeutic agent for the prevention of fibrosis that characterizes progression of chronic kidney disease.

P11

The Use of Prostate-Specific Antigen Velocity as a Screening Tool for Pre-Biopsy Detection of Prostate Cancer and Differentiation of High-Grade Disease in African American Men

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Introduction: The use of a singular prostate-specific antigen (PSA) value as a screening tool for prostate cancer (PCa) in African American men remains controversial. Meanwhile, African American men are at a higher risk for the development of PCa as compared to Caucasians. PSA velocity (PSAV) has been proposed as an alternative screening method, and has demonstrated statistical significance as a predictive model in African Americans, however, sample sizes have been limited. Here, we assess the use of pre-biopsy PSAV, to be used in conjunction with the current standard practice, for the detection of the presence of PCa in one African American population.

Materials & Methods: Demographic data including age, ethnicity, pre-biopsy PSA dates and values, and pathology results were collected from 578 men who underwent prostate biopsy at one institution between 2010-2014. Patients in this cohort were biopsied on the basis of either PSA elevation above the threshold or abnormal digital rectal examination (DRE). Exclusion criteria included non-African American patients and patients with any pre-biopsy PSA value greater than 50 ng/mL. PSAV was calculated as the annualized difference in log PSA using the last two PSA values before biopsy. Logistic regression of the odds of having a positive biopsy was used to examine the addition of PSAV to the standard clinical model (age at biopsy, DRE history, and log PSA). Hazard ratios of PSAV was used to examine an association between PSAV and biopsy results, and ROC curves were developed to compare the impact of discrimination using area under the curve (AUC). These methods were repeated for patients with high-grade prostate cancer (HGPC) detection, defined as Gleason 8 or higher.

Results: PSAV improved the prediction of biopsy-proven prostate cancer (AUC 0.65 vs. 0.62, p = 0.026) in this African American population when combined with singular PSA values, age and DRE, as shown in Figure 1. PSAV reported as annualized difference in log PSA was 0.17 vs. 0.31 (p = 0.002) in the biopsy negative and biopsy positive cohorts, respectively. An additional unit increase in PSAV was associated with a 15% increase in the odds of the biopsy being positive for prostate cancer (multivariable p = 0.02). The HGPC model yielded similar results with hazard ratios of 1.16 for increasing PSAV (multivariable p = 0.03).

Conclusions: PSAV is a significant predictor of the presence of PCa, as well as HGPC, in African American men. In this population, clinicians should consider PSAV, in conjunction with the use of singular PSA values and DRE, when counseling patients regarding prostate cancer risk and the relevance of undergoing prostate biopsy. Future studies should aim to further stratify these results on the basis of Gleason score to establish specific guidelines.
Poster Session 1 - Translational Research/Oncology

**P12**

**The Association of Age with Perioperative Morbidity and Mortality among Patients Undergoing Radical Cystectomy or Partial Nephrectomy**

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**Warren Alpert School of Medicine at Brown University, Division of Urology, Providence, RI**

**Introduction:** Bladder cancer affects a predominantly elderly population, for whom radical cystectomy (RC) remains the standard of care in the management of muscle-invasive disease. However, RC is underutilized in the elderly, despite limited data to suggest inferior perioperative outcomes compared to younger patients. We therefore examined the association of age with perioperative complications, hospital readmission, reoperation, and 30-day mortality among patients undergoing RC.

**Materials & Methods:** We identified 7,625 adult patients aged 18-90 years who underwent RC from 2010-2015 in the National Surgical Quality Improvement Program (NSQIP) database. Thirty-day complications and perioperative outcomes were assessed using a standardized protocol as part of the NSQIP. The associations of age with 30-day complications and perioperative outcomes were evaluated using logistic regression, adjusted for patient features.

**Results:** Out of 26,675 patients, 11,323 (42%) had tumor registry data available. 90% of these patients had a difference ≤ 90 days between the diagnosis dates from administrative and registry data. When comparing administrative data to chart review, 58 out of 59 patients who received bladder cancer care in VA were correctly identified (accuracy 95%, sensitivity 98%, specificity 90%). As expected, receipt of bladder cancer care in VA was substantially more common among those who had bladder pathology reports available versus those who had not (96% vs. 43%, p < 0.001).

**Conclusions:** We successfully combined administrative data with tumor registry, electronic health record, and pathology data (Figure) and validated the resultant data set. This validated data set will now make it possible to better understand how bladder cancer care is currently provided and how intensity of care impacts outcomes such as tumor recurrence and progression.

**Table.** Multivariable analysis of the association of age with perioperative outcomes among patients undergoing radical cystectomy. Models adjusted for year of surgery, race, ASA class, smoking status, functional status, steroid use, operative time, and presence of the following comorbidities: chronic obstructive pulmonary disease, congestive heart failure, hypertension, diabetes, renal failure, and bleeding disorder.

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Age (years)</th>
<th>OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Complication</td>
<td>≤ 60</td>
<td>0.840 (0.73, 0.97)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>1.01 (0.87, 1.16)</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>1.60 (1.34, 1.91)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Blood Transfusion</td>
<td>≤ 60</td>
<td>1.09 (0.91, 1.28)</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>1.34 (1.16, 1.54)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>1.69 (1.45, 1.98)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Readmission</td>
<td>≤ 60</td>
<td>0.95 (0.78, 1.14)</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>0.94 (0.79, 1.12)</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>0.88 (0.74, 1.06)</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>80-89</td>
<td>0.98 (0.80, 1.23)</td>
<td>0.83</td>
</tr>
<tr>
<td>Reoperation*</td>
<td>≤ 60</td>
<td>0.96 (0.72, 1.30)</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>0.95 (0.70, 1.30)</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>0.71 (0.47, 1.09)</td>
<td>0.16</td>
</tr>
<tr>
<td>30-day mortality*</td>
<td>≤ 60</td>
<td>0.95 (0.72, 1.29)</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>0.95 (0.70, 1.32)</td>
<td>0.71</td>
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<tr>
<td></td>
<td>70-79</td>
<td>0.71 (0.47, 1.09)</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>80-89</td>
<td>4.28 (3.23, 7.11)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

*ASA class 1 and 2 combined on multivariate analysis due to small number of events.
Androgenic to Estrogenic Switch in Human Adult Prostate Gland as a Result of Epigenetic Silencing of Steroid 5-alpha Reductase 2

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Introduction: The steroid 5A-reductase type 2 (SRD5A2) is critical for prostatic development and growth. Strategies to modulate SRD5A2 using 5A-reductase inhibitors (5ARI) remain a mainstay in the treatment of benign prostatic hyperplasia (BPH). However, one-third of men are resistant to 5ARI therapies. We previously showed that expression of SRD5A2 is not static, since epigenetic modifications by DNA methyltransferase and pro-inflammatory cytokines somatically silence SRD5A2 during adulthood. Here we wished to identify whether absence of prostatic SRD5A2, when androgenic pathways are blocked, leads to modification of alternative hormonal pathways.

Materials & Methods: Prostatic samples were obtained from patients with symptomatic BPH undergoing transurethreal resection of prostate (TURP) surgery. Prostatic protein expression of SRD5A2, androgen receptor (AR), estrogen receptor (ER) subunits, and aromatase were determined by Western blot, immunohistochemistry (IHC), and ELISA assay. Prostatic levels of testosterone (T), dihydrotestosterone (DHT), estradiol (E) were measured by HPLC-MS. In in vitro study, primary prostatic stroma cells and epithelial cells BPE and BPH-1 were cultured and treated with TNF-α, and the expression of aromatase was determined by qPCR and ELISA.

Results: In prostate specimens that were methylated at the SRD5A2 promoter locus, estrogen response genes are among the most significantly upregulated genes in prostate samples that are methylated at the SRD5A2 promoter locus. The levels of T, E, and aromatase were significantly upregulated, while DHT was significantly decreased. The ratio of T/E was significantly lower. DHT was inversely correlated with T levels, and aromatase was negatively correlated with DHT. Absence of SRD5A2 significantly upregulated the phosphorylation of ERα (pERα), but did not significantly affect the levels of total ERα, total ERβ or pERβ. In primary prostatic stromal cells, the aromatase levels were significantly increased with TNF-α treatment alone or when expression of SRD5A2 was suppressed by siRNA transfection. Treatment of prostatic epithelial BPE-1 cells with TNF-α did not change the androgenic or estrogenic signalling, but the aromatase levels in stromal cells were significantly upregulated when treated with TNF-α and cultured in BPH-1 conditioned media.

Conclusions: Our study demonstrates for the first time that there is an androgenic to estrogenic switch when SRD5A2 is absent in the prostate gland. Our study supports the idea that somatic epigenetic silencing of SRD5A2 changes the prostatic hormonal milieu, and may modulate prostatic homeostasis of SRD5A2 when treated with TNF-α or ER modifiers may prove to be better therapeutic options in carefully selected patients who lack SRD5A2 expression for management of prostatic diseases.

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Survival Outcomes for Patients with Localized Upper Tract Urothelial Carcinoma Managed with Watchful Waiting

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Introduction: Often individuals with upper tract urothelial carcinoma (UTUC) are elderly and have comorbidities and may not be candidates for surgical intervention. Currently the outcome with “watchful waiting” in this population is unknown.

Materials & Methods: We utilized the Surveillance, Epidemiology, and End Results (SEER) database to identify individuals with a localized, histologically confirmed kidney/renal pelvis and ureteral urothelial carcinoma. Cases were excluded if surgical status or survival were unknown. Survival analysis using the Kaplan Meier method was performed between groups based on surgical status and tumor grade. A competing risk model was used to evaluate the cumulative incidence of cancer specific mortality (CSM) and predictors of CSM.

Results: There were 8,328 patients included, and 687 (8.3%) did not receive surgery. Patients without surgery were older (median age, 79 vs. 71 < 0.001) and had smaller tumors (mean size, 2.9 cm vs. 3.5 cm, p < 0.001). The 3-year disease-specific survival (DSS) for patients without surgery was significantly lower compared to those with surgery, (70.8% vs. 90.4%, respectively, p < 0.001). 2-year DSS for patients with high grade tumors was worse than for low grade tumors (65.0% vs. 84.8%, respectively, p < 0.0001). The 5-year cumulative CSM was 58% overall and on multivariable analysis, older age (Hazard ratio (HR), 1.039 p < 0.001) and high tumor grade (HR 2.03, p < 0.0001) were predictors of worse outcome.

Conclusions: A significant number of patients are offered a “watchful waiting approach” for UTUC. These patients are older with smaller disease burden. CSM is over 50% at 5 years. Older age and high grade disease portend worse prognosis.
Materials & Methods: This IBB approved retrospective chart review included 94 women with urinary incontinence treated with a Macroplastique® (Cogentix Medical Inc.) urethral bulking procedure. Pre- and post-procedural UDI-6 and IIQ-7 surveys were obtained, leaving a cohort of 50 living women with both pre- and post-injection data. Of these 50, 30 of the women previously had mid-ureteral slings. We used a binomial test with exact method to assess whether there was a significant proportion of improvement in pre- to post-procedural scores. Additionally, we applied multivariate logistic model to analyse whether there were certain patient characteristics (age, BMI, smoking status, use of vaginal estrogen, history of hysterectomy, or the presence of mixed urinary incontinence) that may predict improvement or not with Macroplastique®.

Results: Of the cohort of 50 women, pre- and post-procedural UDI-6 averages were 1.84 and 1.36, respectively. Average scores for IIQ-7 were 1.46 and 1.14, respectively. The overall improvement in these scores was statistically significant (p<0.001). The overall improvement in pre- to post-injection scores in UDI-6 was significant (p=0.001). No other patient characteristics were negatively or positively statistically significant predictors of improvement for either Q3 or Q4. Multivariate analysis revealed that the only significant predictor of improvement in Q4 was vaginal estrogen use, which is negatively correlated with improvement in ISSQ4 responses alone.

Conclusions: Our results validate the efficacy of the Macroplastique® injection procedure as management for SUI patients with estrogen use, which is negatively correlated with improvement in ISSQ4 responses alone. Our results show that Macroplastique® is overall an effective procedure in our population. However, no particular characteristics were shown to predict improvement other than estrogen use. Our results show that Macroplastique® injection significantly improves the quality of life of patients with SUI in this cohort and support its use in patients in whom other treatment options may not be possible.

Factors Associated With Durability of Intravesical Botulinum Toxin A Injection

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Tufts University School of Medicine, Boston, MA, 2Lahey Hospital & Medical Center, Burlington, MA

Introduction: Patients suffering from overactive bladder (OAB) and neurogenic bladder (NB) without response to behavioral and pharmaceutical intervention may opt for botulinum toxin A injection or sacral nerve stimulation (SNS). Botulinum injections have shown success in treating OAB and NB urinary symptoms, but require repeat injections at an interval of 4-12 months. This study seeks to identify factors associated with the durability of this therapeutic effect.

Materials & Methods: Patients undergoing treatment for OAB and NB at Lahey Hospital and Medical Center between 2004 and 2016 were identified. Demographic, clinical and treatment data were extracted from patient charts. Patients were included if they had at least 1 botulinum injection. Time from initial to second botulinum injection was defined as therapeutic durability. Time from initial to last clinic follow-up was defined and time to event analyses were employed: univariate analysis via log-rank method and multivariate Cox proportional hazards were used to identify associations with therapeutic durability. The multivariate Cox model comprised univariate factors with p values below 0.1 and a priori clinical variables. Significance was defined at the α = 0.05 level.

Results: Of the available patients, 54 patients met inclusion criteria. Median time to repeat injection for those who had a second injection was 296 days. Kaplan-Meier survival estimation that 50% of patients required re-injection at 330 days. On univariate analysis, history of spinal cord injury (p = 0.041), prostate cancer (p < 0.001), history of stroke/CVA (p = 0.037), and history of UTI (p = 0.13) were significantly associated with lower therapeutic durability. On multivariate analysis, only prostate cancer (OR 50.2, 95% CI 2.95-854, p = 0.0068) and history of UTI (OR 4.11, 95% CI 1.02, 16.59) were negatively statistically significant predictors of improvement for other Q3 or Q4.

Conclusions: Botulinum injection showed a median durability of roughly 9 months. Patients with prostate cancer or a history of UTI had a statistically significantly higher risk of lower durability of botulinum injection. Further study is warranted to identify further etiologic origins of these connections or elucidate other associated cofactors.

A Retrospective Analysis of Risk Factors for IPP Reservoir Entry into the Peritoneum after Transversalis Fascia Placement

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Introduction: Placement of an inflatable penile prosthesis (IPP) is the most effective treatment modality for men with erectile dysfunction (ED) refractory to medical management. We have previously demonstrated a protocol for alternative IPP reservoir placement posterior to the abdominal wall musculature, which was shown to be a safe location with extremely low complication rates. This is in contrast to traditional placement in the retropubic space of Retzins, which can result in bowel, bladder and vascular injury. The aim of this study was to review our complications with IPP reservoir entry into the peritoneum after placement posterior to the abdominal wall musculature to further increase the safety of this approach.

Materials & Methods: We retrospectively reviewed our patients with peritoreal entry of the reservoir after posterior to transversalis fascia (PTF) placement during virgin IPP cases performed by a single surgeon. Our goal was to assess common inherent patient and surgical factors that resulted in this complication in order to develop a management algorithm to prevent future occurrence during alternative reservoir placement. We reviewed preoperative patient health characteristics, history of prior pelvic surgery, intraoperative documentation, postoperative follow-up, complication presentation, and imaging for this group. Follow-up visit data was available for up to 24 months after surgery at regular intervals. We were further able to assess long-term outcomes from this complication, including resolution of peritoneal reservoir entry and eventual IPP replacement.

Results: Peritoneal reservoir entry was identified in two patients out of a total of 2,687. These patients had met the previous criteria. They were distinct in that they were noted to be thin (mean BMI 18.5) current or former smokers, without peritoneal surgical historical. Peritoneal entry was identified early after reservoir placement. Neither patient suffered bowel injury and both subsequently underwent successful reservoir removal and IPP replacement. Both are currently doing well with functional IPPs on follow-up.

Conclusions: PTF reservoir placement is a safe, simple and effective method of avoiding vascular and bladder injury during IPP implantation. Peritoneal entry of the reservoir occurs very rarely, and in our series occurred in two patients with distinct physical and pathological features. We recommend early identification of similar patients, with anterior to transversalis fascia placement to prevent peritoneal entry.
Transgender Sperm Cryopreservation: Trends and Findings in the Past Decade
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1Massachusetts General Hospital, Boston, MA, 2New England Cryogenic Center, Boston, MA

Introduction: Awareness and acceptance of transgenderism has increased in the last two decades. The 2001 World Professional Association for Transgender Health’s Standards of Care outlines discussion of reproductive issues with transgender patients prior to initiation of hormonal therapy. To date, there is limited literature regarding the incidence and semen characteristics of transgender individuals banking sperm. We sought to assess transgender sperm cryopreservation in comparison to the non-transgender population in the last 10 years. We also compared semen parameters between the two populations. We hypothesized that there would be an increased incidence of transgender sperm cryopreservation over the last 10 years, corresponding to increasing awareness, and no difference in semen parameters between the two groups.

Materials & Methods: We performed a retrospective analysis of sperm cryopreservation performed at a single center from 2006 through 2016. We analyzed 194 transgender samples and 2327 non-transgender samples for a total of 84 unique transgender bankers and 1398 unique non-transgender bankers. Bankers who preserved multiple samples had the collective semen parameters considered as one sample.

Results: The number of transgender individuals pursuing sperm cryopreservation increased relative to non-transgender individuals from 2006 to 2016. The trajectory of the two groups was significantly different (Figure 1, p < 0.001). There were no significant differences in ejaculatory volume, total sperm count, percent motility, or total motile sperm between the two groups.

Conclusions: This is the largest report to date on the incidence of transgender sperm cryopreservation and comparison of semen characteristics. The incidence of sperm cryopreservation by transgender individuals has increased in the last decade, paralleling the increase in awareness and acceptance, and may reflect increased discussion between transgender individuals and medical professionals. As expected, there were no significant differences in semen parameters.

Predictors of Nerve Stimulation Success in Patients with Overactive Bladder
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Introduction: Patients suffering from overactive bladder (OAB) without response to behavioral and pharmaceutical intervention may opt for third-line therapy with sacral nerve stimulation (SNS). SNS is performed in two stages, with a ‘trial period’ preceding initial lead placement and final device implantation. Patients with a successful trial as defined by a significant reduction in OAB symptoms have permanent implantation while unsuccessful trial leads to explant of the leads. Data predicting which patients will have a successful trial are limited. The present study examines patients undergoing SNS implantation to identify factors associated with successful SNS trial.

Materials & Methods: Patients undergoing treatment for OAB at Lahey Hospital and Medical Center between 2004 and 2016 were identified. Demographic, clinical and treatment data were extracted from patient charts. Univariate analyses were conducted to identify factors associated with SNS treatment success using chi-squared and t-test statistics as appropriate. A multivariate logistic regression model using the significant and a priori clinical factors to predict SNS treatment success was also created. Significance was defined at the α = 0.05 level.

Results: Of 266 patients in the OAB database, 123 patients met inclusion criteria. Of these, 95 (77%) had treatment success. On univariate analysis, age, race, gender, diagnosis of prostate cancer, diagnosis of BPH and lower volume at first urge during urodynamic study (UDS) were associated with an unsuccessful SNS trial (Table 1). On multivariate analysis using age, race, gender, prostate cancer, BPH, and volume at first urge as covariates, male gender (OR = 0.15, 95% CI 0.056-0.451) and lower volume at first urge on UDS (OR 0.985, 95% CI 0.967-0.995) were associated with unsuccessful SNS trial.

Conclusions: SNS is frequently successful at relieving OAB symptoms. Male patients and those with a lower volume at first urge on UDS are more likely to have an unsuccessful SNS trial. Patients in these groups should be counseled on the lower likelihood of SNS success. Further examination of factors associated with SNS from more diverse patient populations may aid in identification of other factors predictive of unsuccessful SNS trial.
The Efficacy of Durasphere as a New Agent for the Treatment of Hypermobile Glans

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Introduction: Proper diagnosis is important to men choosing ON. Men undergoing orthotopic neobladder urinary diversion can be associated with significant complications. These complications include high patient satisfaction, ease of intervention, and low adverse events. Proper diagnosis is a viable option in the armamentarium of treatments for glanular hypermobility due to sphincter deficiency (ISD). This is a retrospective review of 17 patients who underwent glanular bulking with Durasphere by a single surgeon from 2016-2018. Patient data were compiled after extensive review of operative reports, inpatient notes, consult notes, and follow-up visits.

Results: Seventeen patients underwent a total of 61 subcoronal Durasphere injections (mean 3.6, range 2-9). Twelve of these patients have been seen in follow-up on average 13.5 weeks (range 1-36) since their injections. All patients reported satisfaction with their treatment regimen, reduced or absent pain during intercourse, and subjectively improved appearance of their erect penis. None of the patients have reported any adverse events.

Conclusions: Durasphere has a safe and effective history in ISD treatment and our initial experience thus far is promising. Durasphere could be a viable option in the armamentarium of treatments for glanular hypermobility due to high patient satisfaction, ease of intervention, and low adverse events. Proper diagnosis is necessary for optimal treatment to ensure that the penile implant is appropriately sized and positioned in order to rule out floppy glans syndrome and SST deformity. As opposed to glanular hypermobility, these conditions are caused by an undersized implant and require surgical revision.

Factors Affecting Dropout Rate in Patients Undergoing Percutaneous Tibial Nerve Stimulation

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Introduction: Percutaneous-tibial nerve stimulation (PTNS) has been shown to be an efficacious treatment for overactive bladder, with a standard initial therapy of 12 weekly sessions. Outside of clinical trials, real-world data has characterized compliance with treatment or the etiology of dropout. We sought to identify the common etiologies of dropout and correlate demographic variables with noncompliance.

Materials & Methods: All patients who underwent PTNS from January 2014 to November 2016 were identified through CPT code 46986. Patients who completed all 12 sessions were compared to those who did not. Multiple variables were tested for correlation with dropout, including age, BMI, gender, marital status, employment status, smoking status, distance from clinic, and patient perceived improvement.

Results: A total of 65 patients were identified: 66% (43/65) of patients completed all 12 sessions. Significant differences between those who did not complete 12 sessions versus those who did were found for smoking status (p = 0.009) and patient perceived improvement (p = 0.008). There was no significant difference between groups in age (p = 0.48), BMI (p = 0.74), gender (p = 0.39), marital status (p = 0.37), employment status (p = 0.94), or distance from clinic (p = 0.15). The patients who dropped out completed a median of 8 sessions (IQR 6-9). The most common reasons for dropout included perceived lack of efficacy (n = 5), required time commitment (n = 5), and other health problems (n = 4). In a multivariable regression model, smoking status (p = 0.02) and perceived improvement in symptoms (p = 0.04) were significant predictors of dropout. After dropout, 23% of patients subsequently underwent other third line overactive bladder therapies (5/23).

Conclusions: Not surprisingly, the most likely predictor of completing all standard initial sessions of PTNS is patient perceived improvement. Adding smoking status appears to have a significant influence on completing all 12 sessions. The most common cited reasons for dropout are lack of efficacy and time commitment. More research is necessary to further delineate the causes of dropout in order to improve patient compliance.

Sexual Function in Men After Radical Cystoprostatectomy Differs in Men with Ileal Conduit Compared to Orthotopic Neobladder Urinary Diversion

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Introduction: Men with invasive bladder cancer requiring cystoprostatectomy may choose orthotopic neobladder (ON) because of self image issues. Self image issues are intimately associated with sexual function. Choosing an ON must be weighed against the increased exposure to complications from complex surgery, and a realization that high-grade bladder cancer is associated with high morbidity and mortality. Are we really helping men by advising them to consider ON if post-sexual function in these men is unrealistic?

Materials & Methods: 72 men from 2007 to 2016 treated with cystoprostatectomy or total exenteration for bladder cancer were identified. 50 men chose ileal conduit or colon conduit urinary diversion (IC). 22 men chose ON. Post-op complications and overall survival in both groups were retrospectively reviewed. Follow up analysis of sexual functioning in both groups was based on 1) whether interest in treatment for erectile dysfunction (ED) was described in clinic notes, 2) whether a prescription for PDE5 inhibitor medication had ever been prescribed, and 3) whether treatment was ever sought in a referral ED clinic at our institution.

Results: Mean follow up time was 49 months (range 6 to 121 months) for IC patients. Mean follow up time was 85 months (range 4 to 110 months) for ON patients. 38% of IC patients had a complication following surgery (12 Clavin-Dindo grade I, 12 grade II, 5 grade IIIb, 2 grade IVa). 50% of IC patients had a complication following surgery (12 Clavin-Dindo grade II, 1 grade Illa, 5 grade IIIb, 1 grade IVa, 2 grade V). 1/5 men in IC group expressed interest in ED treatment postoperatively (2%). 3/13 men in ON group were sexually active with spontaneous erections (with or without PDE5 inhibitors). 5/13 men in ON group sought care at an ED clinic and were sexually active using either vacuum device, penile injection therapy, or following penile implant. 61% of men in ON group were sexually active.

Conclusions: Invasive bladder cancer has a high mortality. Cystoprostatectomy and urinary diversion can be associated with significant complications. These complications include high interest in ON compared to IC urinary diversion groups. Sexual function appears to be important to men choosing ON. Men undergoing orthotopic neobladder urinary diversion are more likely to be satisfied with treatment options for sexual function then men undergoing ileal conduit urinary diversion.

How Much is Just Right? An Evaluation of Post-Operative Opioid Prescribing for Urologic Procedures at a Single Institution

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Introduction: Opioids prescribed at hospital discharge after a surgical procedure are a potential source of diversion and misuse. Given the increase in opioid abuse over the past decade, it is critical that surgical specialists, including urology, examine opioid prescribing practices to prevent over-prescribing. The optimal quantity of opioid medication prescribed at hospital discharge after urologic surgery has not been well defined. In this study, we summarize opioid prescription and use patterns among patients undergoing urologic procedures, including vasectomy, common proctoendoscopic procedures, and robotic-assisted laparoscopic prostatectomy (RALP).

Materials & Methods: We recruited patients who underwent vasectomy, endoscopy, or RALP at a single institution between October 2016 and February 2017. The endoscopy group included patients who underwent cystoscopy with cystolithotripsy, ureteroscopy, lithotripsy, or stent placement. Reasons for exclusion included age under 16, underlying malignancy, bilateral procedure (except vasectomy), recent procedure on the same urostomy within the past month, additional procedures such as urostomy bag procedures, procedural complication, inability to communicate independently over telephone, and refusal to participate. Patients were called 5-7 days post-discharge and given a 26 item telephone survey inquiring about amount of opioid used, patient-perceived pain control, and discharge instructions. Opioid prescription details were confirmed using the electronic medical record with patient permission.

Results: A total of 57 patients (median age = 56) underwent either vasectomy (n = 10), endoscopy (n = 30), or RALP (n = 17) and met inclusion criteria. Of the enrolled patients within each group, 90% of vasectomy, 67% of endoscopy, and 100% of RALP patients received an opioid prescription (total n = 49). The most commonly prescribed opioid was hydrocodone (54%), followed by oxycodone (26%) and hydroxyzine (26%). The median MME prescribed were: 60 (vasectomy), 64 (endoscopy), and 160 (RALP). Median MME used for vasectomy, endoscopy, and RALP were 37, 27, and 32, respectively (Figure). Among the subset of patients who received an opioid prescription, 78% of vasectomy, 62% of endoscopy, and 24% of RALP patients did not use any of their prescription after discharge (Figure and Table). Only 13% of patients used their entire prescription and 3 patients (6%) called for a refill—all of whom were in the endoscopy group. Only 11% of patients prescribed an opioid reported that they had received instructions for safe drug disposal.

Conclusions: Most patients received opioids post-operatively and used less than half of their prescription. These results suggest that over-prescription of opioids is common after urologic procedures. Unfortunately, few patients reported receiving instructions for safe disposal of unused opioid. Further studies should determine optimal MME dosing by procedure and evaluate risk factors for potentially misuse post-operatively among patients undergoing endoscopic procedures. In addition, efforts should be made to educate patients on safe opioid disposal.
Scientific Session V: BPH/General/Health Policy/Best Practice

The Difficult Catheter Placement: Can we Protect Hospitalized Patients from Iatrogenic Catheter Injury and Reduce Unnecessary Urology Consults?

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Introduction: We describe a large prospective single-center study that assessed factors associated with difficult catheter placement, time to diagnosis, and time to treatment for patients admitted with foley catheter insertion. Our primary objective is to determine whether Medicaid expansion is associated with changes in prostate cancer screening rates.

Results: Connecticut was included in the group of states that expanded Medicaid at the earliest possible time on January 1, 2014. Among men aged 55-69 years who received care in Connecticut, a significant increase in PSA testing was seen in early expansion versus non-expansion states. Interaction analyses were performed to determine effect of Medicaid expansion on screening, and sensitivity analysis excluding health access covariates (insurance, access to healthcare provider) was performed.

Conclusions: Medicaid expansion is associated with increased rates of prostate cancer screening, particularly among Hispanic and non-Hispanic black men. Increased screening in early expansion states was also seen in men who were aged 55-59 years, non-Hispanic black (+1.7%), and Hispanic (+1.7%) races, previously married (+1.3%), not high school graduates (+1.7%), and current smokers (+2.1%).

Using the Lean Model Decreases the Overuse of Perioperative Antibiotics During Endourologic Surgery

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Introduction: Overuse of antibiotics poses numerous health risks to patients, including potential allergic reactions, suppression of normal flora, and development of antibiotic-resistant organisms. The UCLA has prepared a Best Practice Policy Statement for antibiotic prophylaxis for urologic procedures. Within our institution, we sought to determine whether our Urologic practice evidence based antibiotic administration at the time of urologic surgery: Prophylactic antibiotics should be utilized for the duration of the procedure with use not to exceed 24 hours. We anecdotally noted that many patients at our institution were receiving antibiotics for longer than 24 hours.

Materials & Methods: As part of an institutional quality initiative, we collected data on patients who underwent an endourologic procedure in the operating room cystoscopy suite over a 2 week period of time. The physicians were blinded to the data collection and were unaware of this project. Patients were excluded from the collection data if they had positive urine cultures on preoperative testing. All physicians using the cystoscopy suite were surveyed regarding their familiarity with the UCLA Best Practice Policy Statement for prophylactic antibiotic administration. The survey results were analyzed to assess factors contributing to overuse of antibiotics. We used the lean management principles for education to remove waste and improve overall outcomes. Lean methodology was used to identify reasons for overuse of prophylactic antibiotics. Countermeasures were introduced to decrease the overuse of prophylactic antibiotics, including physician, patient, and nursing staff education. A copy of the UCLA Best Practice Statements was placed in all charts for review. Postoperative nursing staff were educated about overuse of antibiotics and collected data to assess the duration of antibiotic prescribed for patients discharged home.

Results: Before interventions, 18/48 patients (37.5%) received prolonged durations of antibiotics. This was usually a 3 day course of antibiotics (most commonly fluoroquinolones) following a prophylactic dose of antibiotics at the time of surgery. Survey results showed that all physicians were aware of UCLA recommendations for prophylaxis. However, only half of physicians followed the UCLA recommendations for prophylactic antibiotic duration for less than 24 hours. After intervention and education, 1/26 (3.8%) of patients received a prolonged course of antibiotics.

Conclusions: Overuse of perioperative prophylactic antibiotics was common at our institution. Lean methodology was utilized to address the reasons for overuse, and to design an intervention intended to decrease antibiotic overuse. The intervention consisting of education of physicians and nursing staff resulted in a decrease in antibiotic overuse. Future studies will include mid- and long-term follow-up to determine whether Urologists continue to adhere to the UCLA Best Practice Policy Statement recommendation regarding perioperative antibiotic prescribing.
Nation-Wide Utilization of Chemoprophylaxis for the Prevention of VTE in Radical Cystectomy: How Well Do Urologists Follow the Guidelines?

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Introduction: Venous Thromboembolism (VTE), which comprises deep venous thrombosis (DVT) and pulmonary embolism (PE) is a major preventable source of morbidity and mortality for patients undergoing radical cystectomy. In an effort to decrease the incidence of VTE in patients undergoing urologic surgery, the American Urologic Association (AUA) published guideline in 2008 recommending best practices for the prevention of VTEs in patients undergoing urologic surgery. The guidelines recommend using chemoprophylaxis in patients who are at moderate risk to VTE unless there is a contraindication to the use of such agents, for which unexplained all patients undergoing radical cystectomy quality. We performed a population-based analysis to determine the utilization of chemoprophylaxis and the various factors which contributed to an increased likelihood of patients not receiving prophylaxis.

Materials & Methods: A population-based analysis was performed using the Perspective Database (Premier, Inc. Charlotte, NC), a dataset capturing hospital charge billing records for over 440 hospitals in the United States. Our study cohort included all adult patients who underwent radical cystectomy between 2006 and 2015. Patients were identified as having undergone a radical cystectomy for a cancer diagnosis by capturing ICD-9-CM codes. Patients who received chemoprophylaxis were identified by specific hospital charge billing descriptions, including the hospital days for which they received the chemoprophylaxis. Those patients who received chemoprophylaxis for at least 80% of their hospital stay were deemed to have received appropriate chemoprophylaxis. Drawing from a 51.9% patient sample, descriptive statistics and multivariate analysis were performed adjusting for weights.

Results: Utilization rate of appropriate VTE chemoprophylaxis differed by a number of patient characteristics (fig. 1). Appropriate use of chemoprophylaxis was only administered to 31.3% of the cohort on aggregate, although a 34.16 percentage point increase in the rate was noted over the study period, with a maximum rate of utilization at 52.02%. Patients with a higher Charlson comorbidity index score, increasing age, and rural hospital locations, compared to insurance and an earlier year of surgery were all associated with increasing risk of not receiving chemoprophylaxis (fig. 2). Patients who received appropriate VTE chemoprophylaxis compared to those who did not had higher rates of VTE, DVT, PE, length of hospital stay and lower 90 day hospital costs (fig. 3). Patients who received appropriate chemoprophylaxis for at least 80% of their hospital stay were deemed to have received appropriate chemoprophylaxis.

Conclusions: We found limited use of chemoprophylaxis in a contemporary series of patients undergoing radical cystectomy, with a large increase in utilization across the study period. Noncompliance may be associated with a decreased risk for VTE, length of hospital stay and overall lower cost of patient care in patients undergoing radical cystectomy.

Simulation in Urology Residency: Teaching Technique, Clinical Reasoning and Medical Knowledge in Urinary Incontinence

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Introduction: We identified lower than expected performance by urology residents in urologic continence standardized national in-service examinations and devised an intervention to improve their knowledge through surgical simulation. Surgical simulation as an educational intervention has been used to improve trainee performance of technical skills while didactic lecture focus on core knowledge. We used a highly structured and faculty-facilitated session of didactic lecture, hands on simulation and problem based learning to improve surgical technique, clinical reasoning and medical knowledge in the field of urinary incontinence management. We hypothesized that surgical simulation training as an educational intervention would improve urology resident’s clinical reasoning and medical knowledge and technical skills in urinary incontinence as assessed by a pre and post intervention assessment and direct observation.

Materials & Methods: We devised a 3.5 hour educational intervention consisting of a 20 minute pre intervention multiple choice assessment test, a 60 minute didactic lecture on clinical diagnosis of incontinence, overactive bladder and stress urinary incontinence; 2 hours of rotating surgical simulation sessions guided by facilitators with paired trainees attending hands on stations in urothral sling placement, sacral nerve stimulator placement, intravesical botox injection, intrarectal bulking agent injection and ureodonic insertion, followed by a 20 minute post intervention multiple choice assessment test. 6 facilitators guided 8 trainees thru the training in September 2016. Endpoints assessed were pre and post intervention assessment examination aggregate resident scores, pre (2016) and post (2017) intervention American Urologic Association In-service Examination results, direct observation of trainee performance by facilitator, and trainee evaluations of the educational intervention.

Results: Pre and post intervention aggregate assessment scores (n=8) were 49.8% and 78.5% respectively, demonstrating a 31.7% improvement in short term core knowledge acquisition. Pre and post intervention aggregate American Urologic Association In-service examination in the subcategory of neurogenic bladder, voiding dysfunction, incontinence were 64% and 66% respectively. Trainee evaluations showed 75% rated the objectives, instruction, facilities and design of the curriculum to be excellent.

Conclusions: Surgical Simulation as an educational intervention to improve medical knowledge and technical skills in urinary incontinence was successful. Short term medical knowledge assessments improved significantly with the training and trainees had a very favorable evaluation of the multiple educational methods that included didactic lecture, hands on simulation and problem based learning. Long term retention of knowledge was harder to demonstrate. Future directions include expanding this format to other areas of urologic training, further developing the competency of the faculty facilitators and refining the assessment tools to measure improvement in trainee’s competencies.

Breaking Through: Elizabeth Ann Gormley and a History of Fistulas for Women in Urology

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Introduction: Since Dr. Mary Louise Gannon became the first female member of the AUA in 1975, women have ascended the ranks and offices of American urology. To date, however, there have yet to be women at one of the highest levels of leadership: the AUA Board of Directors. In 2017, Dr. E. Ann Gormley breaks through this milestone in the storied history of women in urology.

Materials & Methods: Archival research at the AUA, New England Section of the AUA, and Society of Urodynamics, Female Pelvic Medicine and Urogynecology (SUFU); review of her contributions to the scientific literature; and her colleagues’ narrative accounts.

Results: Dr. Gormley was raised in Saskatchewan, Canada, and earned her medical degree at the University of Saskatchewan. She completed urology residency at the University of Alberta. But it was her fellowship in female urology with Dr. Edward McGuire that ignited her research career on urethral slings. As steering committee chair of the Urinary Incontinence Treatment Network, Dr. Gormley oversaw the landmark Trial of Mid-Urethral Slings and Value of Urodynamics Evaluation trials, both published in the New England Journal of Medicine. In 2008, she became the first woman to serve as SUFU president. Dr. Gormley has also achieved a distinguished career as an educator. She joined the faculty at Dartmouth in 1993 and has been residency program director since 2001. A vocal advocate for trainees, she is a past president of the Society of Urology Chairpersons and Program Directors and was named to the Accreditation Council for Graduate Medical Education (ACGME) Residency Review Committee for urology in 2013, now serving as vice-chair. In 2015, for her sustained contributions to resident education, she was honored by the ACGME as one of the nation’s 10 most outstanding program directors. Finally, Dr. Gormley has been a passionate leader in the AUA, having served on the Exam Committee, Nominating Committee, and Bylaws Committee. She was a panel member for the AUA stress urinary incontinence guideline and chaired the AUA/SUFU overactive bladder guideline. After six years as New England Section secretary and then vice president, Dr. Gormley ascended to the presidency in 2013, becoming the first woman to lead the New England Section. After a quarter-century of service to the AUA and the specialty, she was elected by her mentors and colleagues to the AUA Board of Directors.

Conclusions: Dr. Gormley has charted a career of “firsts,” continuing to the present. In 2017, she becomes the first woman to serve on the AUA Board of Directors in the 115-year history of the AUA.
A Study of Resident Sleep Patterns in Relation to Volume and Category of Overnight Pages in a Home Call System

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Introduction: Mitigating resident fatigue is central to the design and implementation of residency programs, especially when using a home call system. Existing studies of resident sleep habits and fatigue are mostly limited to in-house call and rely on self-reporting. We quantified time spent asleep for residents in a home call system, and examined how the volume and type of pages received affected sleep.

Materials & Methods: Urology residents in a single-institution residency were provided with a FitBit Charge HR device to collect objective sleep data over a six-month period. Each page received during this period after 16:00 and before 08:00 was counted and categorized as either “Clinic” (outpatient calls from the after-hours answering service), “Floor” (calls regarding the inpatient urology ward), or “Other” (calls regarding off-floor consults). Data analysis was carried out using IBM® SPSS® Statistics 23 and Numbers.

Results: Residents received a total of 1068 overnight pages while on call. The junior (URO-1) resident received 321 (avg. 7.8/night) pages, followed by 288 (avg. 6.0/night), 265 (avg. 6.3/night), and 194 (avg. 5.0/night) for the next three most senior residents (URO-2, -3, and -4), respectively. On average, residents slept 480 minutes while on call, compared to 436 minutes while not on call (p < 0.05). Each page was associated with 4.71 fewer minutes asleep per page for all residents (r = -0.24, n = 145, p < 0.05), and each page from the “floor” category was associated with 9.02 fewer minutes asleep (r = -0.33, n = 44, p < 0.05). On individual analysis, each page to the junior resident from all categories was associated with 4.23 fewer minutes asleep (r = -0.24, n = 145, p < 0.05). On individual analysis, each page to the junior resident from all categories was associated with 4.23 fewer minutes asleep (r = -0.24, n = 145, p < 0.05).

Conclusions: Call volume decreased steadily with increasing resident seniority, an interesting finding considering that call nights were evenly distributed. This may imply that experience allows senior residents to anticipate problems in order to prevent calls before they happen. Residents sleep less on call in general. Time asleep was reduced with increasing page volume, most significantly when pages were from the “other” category, suggesting more time is needed to address pages regarding patients the resident is unfamiliar with. Calls from the floor were more detrimental for the junior resident only, indicating that experience is a factor for efficient overnight call management. Overall, these findings are the first to objectively measure sleep quality in relation to call volume and type within a home call system, and show that efficient call management is a learned skill that improves throughout residency.

Multi-Institutional Pilot Evaluation of an Online Feedback Platform for Surgical Skill Acquisition

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Introduction: The effective feedback and assessment of surgical skills is vitally important as the training period for surgical residents continues to grow longer in duration. Virtual feedback platforms allow for personalized immediate, directed feedback on surgical skills in the operating room using an online feedback platform. For each interaction, resident performance of various steps of the procedure were assessed, and specific feedback was performed in-person and documented using an online feedback platform. For each interaction, resident performance of various steps of the procedure were assessed, and specific feedback was performed in-person and documented using an online feedback platform.

Results: Between November 2016 and March 2017 participating trainees received procedure-focused feedback immediately after endoscopic and robotic cases. The specific feedback was performed in-person and documented using an online feedback platform. For each interaction, resident performance of various steps of the procedure were assessed, and specific feedback was performed in-person and documented using an online feedback platform.

Conclusions: Attending surgeon feedback is an essential aspect of surgical training. An online feedback platform encourages dialogue between attending and resident in the immediate postoperative setting. Both residents and attending surgeons felt that immediate feedback was beneficial to surgical training and in the acquisition of surgical skills.

180 W XP’s GreenLight Laser Vaporization of the Prostate in High Surgical Risk Patients: 48-month Safety and Efficacy Results for Patients with ASA Score of 3 or Greater

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Introduction: The objective of this study was to compare the safety, efficacy and durability of 180 W XP’s GreenLight photoselective vaporization of the prostate (PVP) in high surgical risk patients relative to those with lower risk. Current studies evaluating surgical risk and PVP are limited by smaller cohorts and/or older, lower power lasers. The GURU® trial established PVP using the 180 W XP laser as comparable to TURP; however, patients’ surgical risk was not included, limiting its validity in deciding who should undergo PVP.

Materials & Methods: All patients who underwent PVP for uncomplicated lower urinary tract symptoms (LUTs) secondary to benign prostatic hypertrophy (BPH) between 2010 and 2017 by a single surgeon at a tertiary referral center were retrospectively reviewed. 496 patients were identified and stratified according to their American Society of Anesthesiologists (ASA) score; 34.7% of patients were classified as “high risk” (ASA score of 3 or greater) and 65.7% of patients were classified as “low risk” (ASA score less than 3).

Results: “High risk” patients were significantly older at baseline and a significantly higher percentage was anti-coagulated; no other significant differences in baseline characteristics were noted. The mean age of the cohort was 70.7 years with a mean preoperative prostate volume of 83.4 mL and mean postoperative follow-up time of 17.5 months. There were no significant differences in procedural time, lasing time or laser energy delivered between the surgical risk groups (mean 48.3 ± 33.7 min, 30.8 ± 20.9 min and 251.9 ± 186.3 KJ, respectively). On multivariate analysis, only prostate volume of 80 mL or greater influenced hospital lengths of stay while both prostate volume and the presence of a urinary catheter at the time of surgery impacted duration of catheterization. Significant improvements in Qmax, PVR, IPSS and QoL were seen after PVP in both surgical risk groups relative to baseline at all follow-up time points. “High risk” status was a significant determinant only in postoperative improvement in Qmax at a mean follow-up of 17.3 months and Clavien grade 1 complications in 1 month. No differences were seen in the occurrence of Clavien grade 2 and 3 complications during the follow-up period in either surgical risk group nor were there any Clavien grade 4 or 5 complications in the 1 month period after surgery. The overall rate of operative reintervention was 4.44%.

Conclusions: PVP using the 180 W XP system is well tolerated in high surgical risk patients and efforts should be made to perform a comprehensive vaporization. This is evidenced by comparable procedure times, lasing time and laser energy delivered and absence of any significant difference in major postoperative complications. Preoperative prostate volume and presence of a urinary catheter at the time of surgery are better predictors of the immediate postoperative outcomes of duration of hospital stay and catheterization. High surgical risk patients benefit significantly from PVP as suggested by similar functional outcomes to patients with less medical comorbidities in up to 48 months of follow-up. Surgical risk classification alone should not be used to bar patients from PVP.
PSA screening at the intersection of Politics and Policy

Intervention: The implementation of health care policy in the U.S. may be impacted by conflicting political philosophies. A "conservative" view of health care emphasizes an individual's right to self-determination, while a "liberal" view holds that government can effectively utilize strategies to balance the needs of the community with those of an individual. Federal screening guidelines promoting population health may be perceived to conflict with conservative values.

The aim of this study was to assess the inter-relationship of a state's percentage of "conservative" men and the impact that the 2012 USPSTF recommendation against PSA-based prostate cancer (PCA) screening on screening probability.

Materials & Methods: Data from the 2012 and 2014 Behavioral Risk Factor Surveillance System was used to identify asymptomatic men (age ≥ 50) without PCA who reported PSA screening in the past 12 months. Odds ratios were determined by multivariate logistic regression analysis, adjusting for age, race, education, income, insurance, healthcare access, and marital status. The change in PSA screening rates were assessed as a function of the percentage of adults in a state describing themselves as "conservative" or "very conservative" in Gallup U.S. Daily (accessed 4/4/16).

Results: Among 222,475 survey respondents, the prevalence of PSA screening decreased between 2012 and 2014 (OR = 0.87, p < 0.001; Fig 1a). In the most conservative states (upper tertile of self-described conservatives) screening prevalence was unchanged (OR = 0.92, CI 0.84-1.00), and in the least conservative states (lowest tertile) there was a significant decline (OR = 0.72, CI 0.64-0.81; Fig 1b). Up to 22% of the variation in PSA screening rates may be ascribed to a state's dominant political leaning (coefficient of determination=0.22), a moderate and significant correlation (ρ = 0.47, P < 0.001).

Conclusions: The changes in PSA screening rates appear to reflect the political divide in the U.S. Despite the 2012 USPSTF guideline and subsequent overall decrease in PSA screening, there was no decline in PSA screening in the most conservative states. This is a hypothesis-generating finding, as it is predicated on observational data that may be affected by selection bias. Nonetheless, this finding suggests that a state's dominant political ideology influences the implementation of federal health care screening policy.

Patient Risk Reclassification Based on Combined Clinical Cell Cycle Risk (CCR) Score

Introduction: Improved prognostic tools for newly diagnosed prostate cancer are needed to more appropriately match a patient's risk of progression. The CCR score is a validated prognostic tool that estimates 10-year prostate cancer mortality (PCM) based on prognostic information from both molecular (cell cycle progression (CCP) gene expression) and clinical (CAPRA) variables. We evaluate how the CCR score can reclassify PCA-risk for men tested within the AUA New England (NE) section relative to NCCN and AUA risk categories.

Materials & Methods: Prostate biopsy samples from 633 men within the AUA NE section were submitted for commercial testing. The CCR score was previously validated and is calculated as a linear combination of CAPRA and CCP score (0.39 x CAPRA + 0.57 x CCP). Patients were assigned to NCCN and AUA risk categories using clinicopathologic data obtained from test request forms. Interquartile ranges (IQR) for each NCCN/AUA risk category were determined from the full commercial cohort (N=20,958). Patients whose CCR-based risk categories were outside the IQR of their NCCN/AUA risk category were reclassified to a different risk category relative to NCCN and AUA risk categories.

Results: Based on NCCN guidelines using clinicopathologic features alone, the commercial cohort was classified as low (n = 386, 61.0%), intermediate (n = 113, 17.9%), and high risk (n = 47, 7.4%). After calculating CCR-risk for men tested within the AUA New England (NE) section relative to NCCN and AUA risk categories. Patients whose CCR-based risk categories were outside the IQR of their NCCN/AUA risk category were reclassified to a different risk category relative to NCCN and AUA risk categories.

Conclusions: The prognostic information in the CCR score results in significant risk reclassification for men with localized disease when compared to stratification based only on clinicopathologic criteria.

P16

New Data Regarding HIV Status as a Predictor of Postoperative IPP Infection

Introduction: Penile prosthesis infections remain challenging despite advancements in surgical technique, device improvements and adoption of antibiotic prophylaxis guidelines. Previous studies have shown that inherent patient health factors can significantly influence inpatient prosthesis (IPP) infection. Among these studies are data that indicate that immunocompromised patients are at higher risk for infectious complications. This study compares IPP infection rates in our HIV positive and HIV negative patients.

Materials & Methods: This study is a retrospective analysis of 952 patients who underwent IPP implantation by ten surgeons at three institutions. HIV status was preoperatively reviewed and no patient had viral loads, CD4 counts, or defining illnesses consistent with AIDS. Patient data were compiled after extensive review of operative reports, inpatient notes, consult notes, and follow-up visits. Age, comorbidities, overall health status, IPP manufacturer, and antibiotic prophylaxis were similar between all patients. We performed univariate statistical analysis to determine if HIV status was a significant predictor of infectious complications.

Results: Of 952 total patients, 25 patients were HIV positive. Twenty-eight patients (3%) in the HIV negative group had postoperative IPP infection. Two of the 25 HIV (4%) positive patients had a post-operative infection. Statistical analysis via Fisher’s exact test confirmed the absence of a significant difference in infection rates between HIV positive and negative men (p = 0.19).

Conclusions: HIV status is a not a significant predictor of infectious complications in our series of patients undergoing IPP implantation. To our knowledge this is the largest series of HIV positive patients undergoing IPP implantation in the literature. Our overall infection rate is consistent with previously published large series of implant patients. Further investigation is needed into the role of immune compromise on infection in primary implant and revision implant cases.
Poster Session II: Other

P18

**Gender-Based Differences in the Durability of Intracavernosal Botulinum Toxin A Injection**

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**Introduction:** Patients suffering from overactive bladder (OAB) and neurogenic bladder (NB) without response to behavioral and pharmaceutical intervention may opt for third-line therapy with botulinum toxin A injection. Botulinum injections have shown success in treating OAB and NB urinary symptoms, but require repeat injections at an interval of 4–12 months. The effect of these factors may be modified by gender, with differential durability when performed in different genders.

**Materials & Methods:** Patients undergoing treatment for OAB and NB at Lahey Hospital and Medical Center between 2004 and 2016 were identified. Demographic, clinical and treatment data were extracted from patient charts. Patients were included if they had at least 1 botulinum injection. Time from initial to second botulinum injection was defined as therapeutic durability; time from initial injection to last clinic follow-up was defined and time to event analyses were employed. Patients were stratified by gender, and univariate time-to-event analyses were performed within each group.

**Results:** Of the available patients, 54 patients met inclusion criteria, of whom 17 were male and 37 were female. Kaplan-Meier estimates of time for 50% of patients to require botulinum reinjection were 328 days for males compared to 305 days for females. On univariate analysis, hypertension (p = 0.026), prostate cancer (p < 0.001), constipation (p = 0.03), and stress incontinence (p < 0.003) were associated with lower durability in males. In females, multiple sclerosis (p = 0.043) and history of UTI (p = 0.024) were associated with lower durability.

**Conclusions:** Botulinum injection showed a slightly longer durability for female compared to male patients. For males, history of prostate cancer, hypertension, constipation or stress incontinence were associated with lower durability, while for females multiple sclerosis and history of UTI were associated with lower durability. Further study with larger numbers will be needed to confirm and expand on these findings and aid in patient selection and counseling.

P19

**Separating the Wheat From the Chaff: an Evaluation of Readability, Quality, and Accuracy of Online Health Information for Treatment of Peyronie’s Disease**

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**Introduction:** Peyronie’s disease affects 3.2–8.9% of the adult male population. In the digital age, it has become commonplace for patients to self-diagnose and explore treatment options online. In the realm of Peyronie’s disease specifically, there is significant variability in the quality of information on the web. This study characterizes available information and evaluates its readability, quality, and accuracy using a set of validated instruments and expert opinion.

**Materials & Methods:** The search term “Peyronie’s disease” was queried on three major search engines (Google, Bing, Yahoo) and the first 50 search results on each search engine were assessed for accuracy by fellowship-trained urologists on a 1–5 scale, where 1 and 5 correspond with 0% and 100% accuracy of the information in the text is accurate, respectively.

Of 150 websites assessed across the three major search engines, 55 websites met inclusionary criteria. The mean readability scores across all websites were 14.53 (Gunning Fog), 11.35 (SMOG), and 9.07 (Dale-Chall), which correspond to an 11th-12th grade reading level. Readability levels were not statistically different between website categories (Table 1). However, the quality of health information on institutional websites (33.75) was significantly higher than alternative medicine websites (35; p = 0.016) and trending higher than commercial (30.48) and support (49.83) websites. Further, 20% of the websites were HON code-certified, comprising entirely of commercial (63.6%) and institutional (36.4%) websites. Similarly, accuracy of websites varied according to website category. Institutional and charitable websites had highest accuracy scores (3.1 and 3.45, respectively) whereas support (1.50) and alternative medicine websites (1.25) had the lowest accuracy scores (p = 0.007 and p = 0.008, respectively).

**Conclusions:** Most health information online regarding treatment of Peyronie’s disease is on non-institutional “dotcom” websites not certified by the Health on the Net Foundation, which is the gold standard for online health information. Despite the fact that most of the information from academic and charitable websites is of adequate quality and accuracy, the readability of websites exceeds the reading ability of most U.S. adults by several grade levels. Urologists should be using digital resources to find accurate, high-quality websites that are written at the recommended 5th–6th grade reading level and work to improve health information online for Peyronie’s disease and its treatment.

P20

**Low Incidence of Clean Intermittent Catheterization with OnabotulinumtoxinA in Diverse Age Groups of Overactive Bladder Patients and Substantial Improvements in Urinary Symptoms and Quality of Life**

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**New York University Langone Medical Center, New York, NY; University of Toronto, ON, Canada; Medical University of South Carolina, Charleston, SC; Bristol Urological Institute, Bristol, United Kingdom; Ghent University Hospital, Ghent, Belgium; The Royal Hallamshire Hospital, Sheffield Teaching Hospitals, NHS Foundation Trust, Sheffield, United Kingdom; USC Institute of Urology, Los Angeles, CA, Allergan plc, Irvine, CA. Allergan plc, Bridgewater, NJ. Vanderbilt University Medical Center, Nashville, TN**

**Introduction:** We evaluated the risk of clean intermittent catheterization (CIC) and assessed the efficacy and quality of life (QOL) outcomes after onabotulinumtoxinA treatment in different age groups of overactive bladder (OAB) patients.

**Materials & Methods:** Pooled data from onabotulinumtoxinA-treated patients in three randomized, controlled trials (N = 1177) were analyzed (post-hoc) by age (< 40, 40-49, 50-59, 60-69 and ≥ 70 years). Assessments at week 12 post-treatment included CIC incidence and duration, mean and percent change from baseline in urinary incontinence (UI) episodes/day, proportions of patients with ≥ 50% UI reduction, positive response (urinary symptoms improved / greatly improved) on the treatment benefit scale, change from baseline in Kings Health Questionnaire (KHQ) domains and adverse events (AEs).

**Results:** The < 40 group had the lowest CIC rate (1.1%) after onabotulinumtoxinA treatment, which increased slightly with age (3.2%, 5.3%, 7.2% in 40-49, 50-59, 60-69, and ≥ 70 groups). Mean CIC duration was 3 and 44 days in the < 40 and 49-49 groups and 78-88 days in the other groups. All groups showed substantial reductions in UI episodes/day (-2.4, -2.6,-3.1, -3.6, -2.9) and percent change in UI (range: -48.8% to -64.4%). High proportions of patients achieved ≥ 50% UI reduction (range: 58.2%-71.1%) and positive treatment response (range: 66.2%-78.3%). Improvements in KHQ domain scores were >3-4 times the minimally important difference. Urinary tract infection was the most common AE in all groups.

**Conclusions:** CIC risk in onabotulinumtoxinA-treated OAB patients was low in all groups and increased slightly with age. All groups showed substantial UI reductions, QOL improvements and treatment benefit. OnabotulinumtoxinA was well-tolerated.
New Data Regarding Penile Length Preservation after IPP Implantation

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Introduction: Patients suffering from overactive bladder (OAB) may be offered sacral nerve stimulation (SNS). Successful SNS implantation may rely on factors at baseline that differ according to gender. The purpose of the present study is to identify factors within male or female gender which are associated with successful SNS implantation and to identify possible effect modification associated with gender.

Materials & Methods: Patients undergoing treatment for OAB at Lahey Hospital and Medical Center between 2004 and 2016 were identified. Demographic, clinical and treatment data were extracted from patient charts. Patients were stratified by gender into groups. Within groups, univariate analyses were conducted to identify factors associated with SNS treatment success using chi-squared and t-test statistics as appropriate. A multivariate logistic regression model to predict SNS treatment success was also created to identify possible effect modification associated with gender.

Results: Of 268 patients in the OAB database, 128 patients met inclusion criteria. Within the male subgroup, 26 of 47 men (44.7%) had successful treatment, compared to 73 of 81 women (90.1%). Within the male group, the factors significantly associated with SNS failure were mean volume at first urge on UDS (80.5 ml in SNS failure compared to 126.5 ml in SNS success) and smoking (SNS failure more likely to be current smokers, p = 0.039). Similarly, on multivariate analysis only lower volume at first urge was statistically significantly associated with SNS failure (OR = 0.97, 95%CI = 0.95-0.99). Within the female group, there were no statistically significant associations between measured variables and SNS success. Notably, mean volume at first urge on UDS was not statistically significantly associated with SNS failure, though there was a similarly large difference between groups (97.5 ml in SNS failure compared to 136.0 ml in SNS success). On multivariate analysis in the female group, there were no significant factors associated with SNS success.

Conclusions: SNS is frequently successful at relieving OAB symptoms. The rate of success in men is significantly lower than in women, suggesting that SNS implantation is more effective in women than men. The best predictor of success for male patients in this study was higher volume at first urge on UDS. Further study is needed to evaluate other predictors of SNS success and to further characterize differentiating characteristics between male and female patients with respect to overactive bladder treatment.
Impact of Prior Ureteral Stent on Future Treatment Decisions: EDGE Multi-Institutional Survey

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Introduction: While well recognized that ureteral stents cause significant postoperative discomfort, implications of their impact on quality of life have not been fully evaluated. In particular, it is unclear whether prior stent experience affects subsequent treatment decisions. We previously developed and validated a survey to assess the effect of prior experience on willingness to undergo future stoma therapy in general, and willingness to accept higher postoperative risks in order to forgo stent placement in particular.

Materials & Methods: The survey assessing the impact of decreased quality of life on subsequent treatment decisions was distributed to patients with a history of ureteral stent at four geographically disparate academic centers between July and October 2016. Responses were encoded in duplicate to ensure accuracy. Statistical analysis was performed using Chi square analyses.

Results: A total of 135 surveys were completed. Assessing prior stent experience, those reporting more pain with the stent were less likely to accept surgery for an asymptomatic stone (p = 0.001). When informed that ureteroscopy with stent omission would have a small increased risk of unplanned return visit compared with ureteroscopy with a stent, 26% chose surgery without a stent. Although not statistically significant, the percentage increased to 34% when assessing only those who reported worse pain with the stent than the stone. Conversely, of those that reported worse pain with the stone, only 19% chose surgery without a stent. When assessing impact of quality of life changes, only decreased interest in socializing (p = 0.011) was associated with a higher likelihood to choose stent omission understanding this may entail greater risk of unplanned hospital return. Other consequences of stent placement (e.g. missed work, inability to care for family, exercises less, interest in decrease sex activity) were not associated with a higher likelihood of choosing surgery without a stent.

Conclusions: Patients experiencing more pain with their stent than the inciting stone are less willing to treat asymptomatic renal stones. The impact of the stent on decreased socializing was noted to increase likelihood to accept greater perioperative risks in order to omit stent placement. With increased emphasis on shared medical decision making, an enhanced understanding of factors affecting these decisions is important in order to appropriately counsel patients.

P27

Using Electronic Health Records Data in Practice Audit: Ureteroscopy – Stent or No Stent

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Introduction: Ureteroscopy is commonly used in the management of stone and other diseases of the ureter. The use of stent before and after ureteroscopic lithotripsy remains controversial. Electronic Health Records (EHR), a software platform that contains data captured during patient-health care professional encounter has become ubiquitous. It is useful for billing but other applications in research, data analysis, practice audit and quality improvement are gaining momentum. In 2013, we adopted the use of Electronic Health Record (EHR) as recommended and supported by the Ontario MD in collaboration with the Ministry of Health and Long-Term Care. The purpose of this study is to understand the basic ways of manipulating EHR data to identify “hot spots” in ureteral stone management and describe the treatment outcomes in a community urology practice.

Materials & Methods: Data recorded in the physician’s clinical notes, operative room records including details of procedure and fluoroscopy times and follow up were reviewed and extracted. Tracking of the procedures were verified using the HIP/HMO/LTC Diagnostic and Billing codes. For question formation and sequencing, a literature search (English) was completed through PUBMED, Medline, Cochrane Data base using such words and phrases as EHR Ureteroscopy Stent or No Stent, EHR Ureteroscopy, EHR Data analysis. Data collection was between 2001 and 2004 and these included patient’s age, sex, stone features, stent or no stent, operating and fluoroscopy times, whether hooked electively or admitted through the ER. Data extracted were then transferred into a random number spreadsheet function to assist with analysis.

Results: There were 192 procedures - 149 ‘Stent’ and 43 ‘No Stent’, ratio 3:1. These two groups were comparable regarding patients, stone characteristics, stone free rates, infections and complications. The mean stone size was 8.5 ± 2.0 mm. Stone free rates at 6 weeks was 100% in each group. There was relief of renal colic in all patients immediately. After 2 days, lower urinary tract symptoms (LUTS) were significantly less in patients with ‘no stent’ compared to those who were stented. Our findings appear to be similar with published data in the literature.

Conclusions: Data extraction and manipulation from the EHR was successful. In addition to billing purposes, EHR application in research, chronic disease management, quality improvement and practice audit is attractive and will grow.

Renal Malignancy and Peritumour Fat: Is It Necessary to Send Peritumour Fat for Pathology During Partial Nephrectomy?

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Introduction: Nephron-sparing surgery is being used increasingly for renal malignancy. Peritumour fat is routinely sent as a separate specimen for staging purposes by the surgeon. Our aim is to determine the prevalence of peritumour fat involvement per tumor stage.

Materials & Methods: We retrospectively reviewed partial nephrectomies, performed open, laparoscopic, or robotically between 2011 and 2015. We included patients who had undergone post-prostatectomy interventions to treat a U.A. With Wilcoxon Signed-Rank test was used to compare EPIC 26 UI scores obtained after prostatectomy but before UI intervention to those obtained pre-prostatectomy counseling after radical prostatectomy.

Results: Of 157 partial nephrectomies performed by two surgeons, 127 (80.9%) resulted with malignancy as final pathology, of which 98 (77.2%) had perinephric fat sent for staging purposes by the surgeon. While well recognized that ureteral stents cause significant postoperative discomfort, implications of their impact on quality of life have not been fully evaluated. In particular, it is unclear whether prior stent experience affects subsequent treatment decisions. We previously developed and validated a survey to assess the effect of prior experience on willingness to undergo future stoma therapy in general, and willingness to accept higher postoperative risks in order to forgo stent placement in particular.

Materials & Methods: The survey assessing the impact of decreased quality of life on subsequent treatment decisions was distributed to patients with a history of ureteral stent at four geographically disparate academic centers between July and October 2016. Responses were encoded in duplicate to ensure accuracy. Statistical analysis was performed using Chi square analyses.

Results: A total of 135 surveys were completed. Assessing prior stent experience, those reporting more pain with the stent were less likely to accept surgery for an asymptomatic stone (p = 0.001). When informed that ureteroscopy with stent omission would have a small increased risk of unplanned return visit compared with ureteroscopy with a stent, 26% chose surgery without a stent. Although not statistically significant, the percentage increased to 34% when assessing only those who reported worse pain with the stent than the stone. Conversely, of those that reported worse pain with the stone, only 19% chose surgery without a stent. When assessing impact of quality of life changes, only decreased interest in socializing (p = 0.011) was associated with a higher likelihood to choose stent omission understanding this may entail greater risk of unplanned hospital return. Other consequences of stent placement (e.g. missed work, inability to care for family, exercises less, interest in decrease sex activity) were not associated with a higher likelihood of choosing surgery without a stent.

Conclusions: Patients experiencing more pain with their stent than the inciting stone are less willing to treat asymptomatic renal stones. The impact of the stent on decreased socializing was noted to increase likelihood to accept greater perioperative risks in order to omit stent placement. With increased emphasis on shared medical decision making, an enhanced understanding of factors affecting these decisions is important in order to appropriately counsel patients.
Introduction: Upper tract urothelial carcinoma (UTUC) is an understudied disease with limited large-scale studies providing evidence for treatments. Thus far, adjuvant chemotherapy, neoadjuvant chemotherapy (NAC) has been purported to have a potential survival benefit for patients with UTUC. True random and non-randomized trials exist to prove this. We present a case matched comparative effectiveness analysis of NAC compared to surgery alone for patients with UTUC undergoing nephroureterectomy.

Materials & Methods: The National Cancer Database was queried for patients with transitional cell carcinoma of the ureter or renal pelvis, cancer TanyNOM0, without receipt of radiation or adjuvant chemotherapy. NAC patients were propensity score matched 1:5 with surgery alone patients using age, sex, clinical T stage, Charlson comorbidity score, and tumor site; an acceptable covariate balance between groups was assured. Overall survival (OS) was assessed using Kaplan-Meier and multivariate Cox regression methods were applied to test predictors of OS. A subanalysis is additionally matched for pathologic stage.

Results: Of 44,845 cases of upper tract cancer, 13,973 cases met inclusion criteria. On Cox regression of the entire included cohort, NAC, age, male gender, unilateral site and advanced T stage were associated with lower OS (p = 0.017). The matched sample comprised 112 NAC and 522 surgery alone cases; OS with NAC was lower compared to surgery alone at 5 years but did not reach statistical significance (42.0% vs. 53.3% p = 0.08) (Figure 1). On subanalysis, a cohort matched for similar variables with the addition of pathologic stage similarly found no difference in OS.

Conclusions: In this large hospital-based cohort analysis, NAC did not show a statistically significant difference in OS compared to a control matched surgery-alone group. While NAC may have no true OS benefit, these results may be affected by unmeasured covariates, as patients thought to have clinically more advanced disease may be selected for NAC, but there is little evidence available for comparison. Notably we could not determine if NAC improves cancer-specific survival, as CSS is not recorded in the NCDR. Further study is required to clarify the risks or benefits of NAC for this rare disease.

Impact of Adequate Pelvic Lymph Node Dissection on Overall Survival after Radical Cystectomy: A Stratified Analysis by Stage and Receipt of Neoadjuvant Chemotherapy Alexander Z. Cole, MD, Nicola A. Menezes, MD, Christian C. Pascal, MD, Nicolas A. Galanopoulou, MD, Philipp-Gillard, MD, Jacqueline Speed, MD, Thomas Seisen, MD, Quck-Dan Trinh, MD

Introduction: The benefit of pelvic lymph node dissection (PLND) at the time of radical cystectomy (RC) is still poorly understood as modern RC is often performed without PLND for patients with low-risk disease. The presence or absence of metastatic disease, one or more procedures (e.g. laser ablation) prior to definitive surgery, a patient receiving neoadjuvant therapy, and patients receiving adjuvant therapy are factors associated with survival benefit in RC for bladder cancer. This study, including patients undergoing cystectomy between 2004-2012, used the National Cancer Database to assess the stage-specific benefit of an extended PLND depending on whether a patient received NAC. A subanalysis is additionally matched for pathologic stage.

Results: Of 48,845 cases of upper tract cancer, 13,973 cases met inclusion criteria. On Cox regression of the entire included cohort, NAC, age, male gender, unilateral site and advanced T stage were associated with lower OS (p = 0.017). The matched sample comprised 112 NAC and 522 surgery alone cases; OS with NAC was lower compared to surgery alone at 5 years but did not reach statistical significance (42.0% vs. 53.3% p = 0.08) (Figure 1). On subanalysis, a cohort matched for similar variables with the addition of pathologic stage similarly found no difference in OS.

Conclusions: These data suggest the survival benefit of adequate pelvic node dissection is preserved in men with T1 or T2 disease but not T3 or T4 disease regardless of whether NAC was given. The challenge for future studies is to learn more about the optimal number of nodes to remove in patients with T3 or T4 disease who have received NAC. The benefit of extended PLND may be at least partially due to the presence of occult or “micro” metastatic disease prior to cystectomy. Given that NAC may perform a similar function, the benefit of PLND may differ depending on receipt of NAC. This has not previously been assessed. Therefore, we designed a study to measure the stage-specific benefit of an extended PLND depending on whether a patient received NAC.

Examining the Association between Biopsy and Clinical Staging in Upper Tract Urothelial Carcinoma

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Introduction: Ureteroscopic biopsy of upper tract urothelial carcinoma (UTUC) continues to be debated with advocates using it for additional diagnostic information and detractors wishing to minimize instrumentation of upper tract tumors. Nevertheless, trends have shown increasing use of ureteroscopy and biopsy over the past thirty years. Of note, biopsy is limited by small instruments and confined working space and small data that allow for measurement of disease recurrence and progression. The prime data source for population-based studies has been SEER-Medicare, but SEER data is limited because pathologic information is only abstracted at time of diagnosis. We set out to obtain longitudinal pathology data by developing a natural language processing (NLP) engine to automate abstraction of important details from full test pathology reports.

Materials & Methods: We selected a national random sample of 600 bladder pathology reports from the Department of Veterans Affairs (VA) Corporate Data Warehouse. These reports were independently annotated by two reviewers with discrepancies resolved by a third to develop a gold standard. We used Cohen’s kappa to validate inter-rater reliability for histology, invasion (presence versus absence and depth), grade, and stages of presence of muscularis propria and of carcinomatous tissue. In the second phase, we iteratively trained, developed, and tested the NLP engine’s ability to abstract these variables from the reports. We assessed NLP performance by calculating accuracy, positive predictive value (PPV), precision, and sensitivity (recall) and then applied the NLP engine to pathology reports from 10,275 bladder cancer patients.

Results: The validated engine was capable of abstracting pathologic characteristics for 99% of bladder cancer patients. Inter-rater reliability was excellent between the two reviewers (kappa ranging from 0.82 to 0.90). When comparing the NLP output to the gold standard, NLP achieved the highest accuracy (0.98) for presence of carcinomatous tissue in situ. Accuracy for histology, invasion (presence versus absence and depth), grade, and stages was 0.96, 0.96, 0.95, and 0.95, respectively. The prime data source for comparison. Notably we could not determine if NAC improves cancer-specific survival, as CSS is not recorded in the NCDR. Further study is required to clarify the risks or benefits of NAC for this rare disease.

Conclusions: We developed an NLP engine to accurately abstract important pathologic details from full test bladder cancer pathology reports. This engine allowed for abstraction of data from the vast majority of the 10,275 patients included, enabling us to develop a population-based cohort of patients with large-scale studies providing evidence for treatments. Thus far, adjuvant chemotherapy, neoadjuvant chemotherapy (NAC) has been purported to have a potential survival benefit for patients with UTUC. True random and non-randomized trials exist to prove this. We present a case matched comparative effectiveness analysis of NAC compared to surgery alone for patients with UTUC undergoing nephroureterectomy.
Characterizing the Costs of Complications After Cystectomy
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Introduction: Radial cystectomy (RC) is subject to substantial morbidity and mortality. Understanding costs of different categories of complications may be valuable in guiding efforts to improve care. We studied the cost of different categories of complications in RC to identify drivers of expenditures.

Materials & Methods: Using the Premier Hospital Database we identified patients who underwent RC for BC (RC). Ninety-day complications were captured using ICD9 codes. Complications were categorized according to Agency for Healthcare Research and Quality Clinical Classification Software. The primary outcome was cost of complication and secondary outcomes were mortality, length of stay (LOS), and discharge disposition. A generalized linear model conforming to a gamma distribution was used to evaluate cost data and all models were adjusted for patient, hospital, and surgery characteristics.

Results: We identified 9,137 RC patients, representing a weighted population of 57,553 patients from 600 hospitals across the US between 2003-2013. Versus-thromboembolism (VTE) was the costliest index complication costing over $10,000 and pulmonary complications were the most expensive readmission complication costing over $30,000. After room and board, pharmacy and laboratory costs were the primary sources behind VTE costs. The three most costly index complications were VTE, infectious, and wound and soft tissue and pulmonary (p < 0.001 compared to no complication). A complication increased the length of stay by 4 days. Nearly 1 in 3 RC patients were readmitted within 90 days and the top three costliest readmission complications were pulmonary, VTE, and neurological. Being married, fewer comorbidities, shorter operations, lack of transfusions, teaching hospitals, high volume hospitals, and high volume surgeons were associated with statistically significantly lower costs of complications after RC.

Conclusions: Complications after RC can be cost stratified. VTE is one of the most expensive complications after RC during index stay and readmission. This work highlights potential candidates for future quality improvement initiatives in BC care.

Determinants of Active Surveillance in Patients with Small Renal Masses: A National Cancer Database (NCDB) Study
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Introduction: Active surveillance (AS) has been increasingly recognized as a viable management strategy for patients with small renal masses; that offers the delay or avoidance of definitive treatment. However, little is known about national utilization trends for AS, or the factors that influence initial expectant management.

Materials & Methods: We identified patients with clinical T1a renal masses within the National Cancer Database (NCDB) between 2010 to 2014. Patients were excluded based on the following criteria: metastatic or locally advanced disease, unknown management, or those who were offered but refused treatment for active surveillance. Patients were dichotomized according to receipt of AS versus definitive treatment. Chi square test and t-test were used to evaluate differences in clinical, demographic, socioeconomic, and treatment-related characteristics differences between the two groups. We examined determinants of AS versus definitive treatment among patients with small renal masses using multivariate logistic regression models.

Results: We identified 66,573 patients that satisfied the inclusion criteria. Of the total cohort, 1,953 (2.9%) individuals received initial management with AS, while 64,620 (97.2%) received definitive treatment. Treatment modality received included: partial nephrectomy in 37,257 (55.1%); radical nephrectomy in 19,668 (29.1%), cryo-ablation in 6,636 (9.8%), thermal ablation in 2,096 (3.1%), and other definitive therapy in 1,963 (2.9%). On multivariate analysis, increasing patient age (OR: 1.10, 95% CI: 1.09-1.10, p < 0.0001), smaller tumor size (OR: 1.09, 95% CI: 1.08-1.10, p < 0.0001), and treatment at an academic center vs. community hospital (OR: 1.15, 95% CI: 1.10-1.20, p < 0.0001) were significantly associated with increased use of active surveillance as opposed to definitive treatment.

Conclusions: We observed a clinical, regional, and facility-level differences in the utilization of active surveillance in patients with T1a renal masses. Further investigation is warranted to better understand the forces underlying initial management decisions for patients with small renal masses.

Perioperative Outcomes of Aspirin Use in Partial Nephrectomy
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Introduction: As the incidence of cardiovascular disease continues to increase, so too does the patient population on anti-platelet therapy who requires urologic surgical intervention. We sought to address the perioperative outcomes for those undergoing partial nephrectomy (PN) while taking or not taking perioperative aspirin (ASA).

Materials & Methods: A retrospective review of patients undergoing PN (ICD9 55.4) from 2003 to 2015 was performed on the Premier Hospital Database (Premier Inc, Charlotte NC, USA), a nationally representative hospital discharge dataset. We restricted the study to elective procedures with a diagnosis of an indeterminate or malignant renal mass, and excluded patients with a possible cardiovascular or cerebrovascular event on the day of surgery. To reduce unmeasured confounders, we limited the cohort to hospitals that - during the course of study - had at least one patient that received perioperative aspirin yielding a total cohort of 10,807 patients. The cohort was dichotomized into two groups; those receiving perioperative ASA (7.2%, n = 774) and those with no perioperative ASA (92.8%, n = 10,033).

In terms of outcomes, we assessed in hospital rates of: major bleeding, overall transfusion, day-of-surgery transfusion, prolonged (> 4 days) length of stay (LOS), and prolonged (> 285 minutes) operative time. We also assessed 90-day rates of: cardiovascular catastrophe (myocardial infarction and/or cerebrovascular accident), readmission, major complication (Clavien-Dindo ≥ 3), and deep vein thrombosis/ pulmonary embolism. The statistical analysis was based on crude and adjusted logistic regression models, which accounted for patient, hospital, and surgical characteristics.

Results: Patients receiving perioperative ASA tended to be older (58% vs. 38% ≥ 65 years, p = 0.0001), predominantly male (73.1% vs. 58.7%, p = 0.001), and less healthy (34.8% vs. 18.4% with a Charlson Comorbidity Index score ≥ 2, p = 0.003). Our analysis showed that perioperative ASA was not associated with increased in-hospital morbidity overall and, only for minimally invasive PN, there was a slightly reduced day-of-surgery transfusion rate (OR 0.29, CI [0.05-0.9], p < 0.05). With regards to 90-day outcomes, perioperative ASA use was associated with a significantly elevated odds for a cardiovascular catastrophe (OR 7.56, CI [3.38-16.92], p < 0.001), in contrast, specifically for minimally invasive PN, there was a lower likelihood for readmission (OR 0.48, CI [0.24-0.94], p < 0.05).

Conclusions: The current study, which represents the largest study on the impact of perioperative ASA on surgical morbidity of PN, suggests that perioperative ASA can be safely continued among patients undergoing PN.
IMP3 Positivity Predicts Metastatic-Free Survival in a Contemporary Cohort of Patients with Renal Cell Cancer

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Introduction: Prognostic markers in renal cell cancer (RCC) can be clinically useful to risk-stratify patients in regards to both overall and cancer specific survival. IMP3 staining has been shown to correlate with adverse outcomes in patients diagnosed with renal cell cancer. In this study, we sought to validate IMP3 staining as a predictor of development of metastatic disease in a contemporary cohort of patients treated surgically for RCC.

Materials & Methods: After obtaining IRB approval, pathology records were reviewed at our institution to identify patients undergoing either partial or radical nephrectomy between November 2008 and September 2014. A total of 302 patients were included in the study. The medical records of these patients were retrospectively reviewed to identify pertinent variables, including gender, age, medical comorbidities, treatment modality, imaging results before and after treatment (i.e. staging and surveillance), RCC subtype and Fuhrman grade, and IMP3 staining. Multivariable analysis was utilized to assess whether IMP3 positivity correlated with development of metastatic disease and overall survival.

Results: A total of 302 patients were included in the study, including 30% female and 70% male patients. Of the 302 renal masses (302 patients), 60 (19.9%) stained positive for IMP3, while 242 (80.1%) stained negative for IMP3. On multivariate analysis, IMP3 staining correlated with metastatic-free survival (p = 0.014), but did not correlate with overall survival.

Conclusions: Assessing a patient’s risk for developing metastatic disease after treatment for renal cell cancer has potential implications for patient counseling and surveillance protocols. In addition, as targeted agents are being evaluated for use in the adjuvant setting, risk stratification of patients would help identify those patients who may benefit most from adjuvant therapy. In this study, IMP3 staining predicted the development of metastatic disease. Overall survival was not related to IMP3 staining, but survival may be related to duration of follow-up. Further evaluation of this cohort of patients will include long-term cancer specific survival and overall survival, as well as identification of other factors that may correlate with IMP3 positivity.

Adjuvant Chemotherapy in the Treatment of Lymph Node Positive Squamous Cell Carcinoma of the Penis: Analysis of the National Cancer Database

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Introduction: While the use of neoadjuvant TIP (paclitaxel, ifosfamide, and cisplatin) has been well described, the use of adjuvant chemotherapy (ACT) in the treatment of node positive squamous cell carcinoma (SCC) of the penis is controversial and there has been few large studies looking at utilization and outcomes. We sought to describe the use of adjuvant chemotherapy in patients with lymph node positive disease (N+) penis cancer using a large nationwide U.S. cancer database.

Materials & Methods: The National Cancer Data Base (NCDB) (2004-2014) was used to extract all patient with non-metastatic SCC of the penis who underwent partial or total radical penectomy with inguinal lymph node dissection. Only patients found to have N+ were included in our cohort. Patients were categorized according to receipt of ACT. Descriptive statistics were used to compare patients according to receipt of ACT. Multivariable logistic regressions were performed to determine patient, tumor or facility characteristics associated with use of ACT. Finally, multivariable Cox regression analysis was used to determine the impact of ACT on overall survival (OS).

Results: A total of 661 patients with N+M0 penile SCC were identified. Of these, 253 (38.3%) patients undertook ACT. Median age at diagnosis was 59 in those who received ACT and 65 in those who did not (p < 0.001). After adjusting for all variables, ACT was more likely to be administered to patients with a lower Charlson-Deyo Score (p = 0.04), lower education level (p = 0.02), patients treated at a community cancer center (p = 0.03) or in the New England/Mid-Atlantic regions (p < 0.001), and patients with higher clinical or pathologic N stage (p < 0.001, p < 0.001). Median survival was 23.5 months for patients who received ACT and 24.3 months for those who did not. Although survival was not statistically significant in median survival (p = 0.224, HR 1.16, 95% CI 0.91).

Conclusions: More than a third of patients with N+ SCC of the penis receive ACT. Other than more advanced disease, many patient and facility characteristics are associated with receipt of ACT. We did not find significant differences in overall survival according to receipt of ACT. Further studies are needed to better define the role of ACT in advanced SCC of the penis.
Implementation of a Perioperative Venous Thromboembolism Prophylaxis Program for Patients Undergoing Radical Cystectomy

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Introduction: Patients who undergo radical cystectomy are at high risk for venous thromboembolism (VTE). Prophylactic anticoagulation is routinely used post-operatively following radical cystectomy; however, the rate of deep venous thrombosis and pulmonary embolism remains high. Our enhanced recovery protocol includes generation of a VTE prevention score to predict VTE risk and implement prophylaxis based on the score.

Materials & Methods: We utilized the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) to perform a single-institution, retrospective, pre- and post-intervention analysis of a systematic VTE prophylaxis program. The primary end point was 30-day post-operative symptomatic DVT or PE. Patients undergoing a bilateral cystectomy were included in our analysis. The principal outcome measure was the 30-day symptomatic VTE rate.

Results: Among 310 patients who underwent radical cystectomy from July 2011 to January 2017, 219 (71%) were in the pre-intervention cohort and 91 (29%) were in the post-intervention cohort, which began in June 2015. Compared with the pre-intervention cohort, patients in the post-intervention cohort demonstrated a significantly lower post-operative VTE rate (6.4%, n = 14 pre-intervention vs 1.1%, n = 1 post-intervention; p = 0.048). The one VTE event in the post-intervention cohort occurred prior to initiation of 30-day post-discharge prophylaxis. There was no increase in bleeding events among the post-intervention cohort.

Conclusions: VTE prophylaxis should consist of preoperative, postoperative, and post-discharge prophylaxis. A systematic VTE prophylaxis program, including local guideline adaptations, bedside medication delivery, and patient education, was associated with significantly fewer post-operative VTE events among patients undergoing radical cystectomy.

Urethroplasty Outcomes for an Algorithmic Approach for Fossa Navicularis Urethral Strictures

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Introduction: Reconstruction of fossa navicularis (FN) strictures is difficult, requiring a multitude of reconstructive techniques to achieve both a normal cosmetic appearance and patient urethra. A combination of both 1 and 2 stage procedures using both buccal mucosa grafts (BMG) and fasciocutaneous flaps have been reported. Although there is no universally accepted technique, many prefer a 2 stage approach for FN urethral reconstruction. We have implemented a standardized algorithm for FN stricture reconstruction based on etiology, lumen size, and glans size to maximize the number of 1 stage reconstructions performed. The objective of our study was to evaluate the outcomes of this standardized approach.

Materials & Methods: A retrospective review of a prospectively maintained urethral reconstruction database from 2011-2017 was performed. Patient demographics, stricture etiology and outcomes were recorded. Patients with isolated FN strictures undergoing urethroplasty via standardized operative algorithm were included for analysis (Figure 1). Patients with an isolated meatal stenosis, those undergoing a meatotomy or meatoplasty, or a penile stricture involving the fossa navicularis were excluded. Pre and postoperative assessment included questionnaires to assess sexual function and patient perception of genital function. Stricture recurrence was defined as the need for subsequent procedure.

Results: A total of 460 patients were identified in the anterior urethroplasty database. 34 patients met inclusion criteria for analysis. 29% patients had LS, 6% had hypospadias, 44% were intravesical, and 9% were intraducal. 18 (53%) patients underwent a single stage repair. BMG, 5 (29%) underwent a two stage repair with BMG, and 4 (18%) underwent a combined BMG and fasciocutaneous flap repair. 2 stage BMG repairs were performed in all hypospadias strictures, and in 50% of LS strictures. At an average follow-up of 6.8 months there was one structure recurrence. Changes in average SHIM score were recorded with improvements seen in the dorsal inlay group (SHIM = +0.67), no change noted in those undergoing two-stage repair (SHIM = +0.67) and a decreased average score was reported for those undergoing dorsal inlay and fasciocutaneous flap repair (SHIM = -3.5). All patients completing a postoperative satisfaction questionnaire were either “very satisfied” (67%) or “satisfied” (33%); 2 patients reported increased penile sensitivity following surgery (dorsal inlay, dorsal inlay + flap), while 3 patients reported a decreased penile sensitivity following surgery (dorsal inlay).

Conclusions: An algorithmic approach to reconstruction of FN strictures demonstrates that the majority can be successfully reconstructed with a 1 stage procedure. 2 Stage procedures should be reserved for patients who are hypospadias repair failures or with obliteratoric lichen sclerosus strictures. Postoperative sexual function complaints are rare regardless of reconstruction technique.

Survival Analysis of Cytoreductive Nephrectomy in the Elderly

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Introduction: Renal cell carcinoma has shown to be one of the few cancers responsive to resection of the primary lesion in the setting of metastatic disease. Cytoreductive nephrectomy has been previously evaluated in the population as a whole, but the aging of the population and increasing health status in older patients necessitates evaluation in an explicit cohort. Using the National Cancer Database, the effect of cytoreductive nephrectomy was explored specifically in the elderly population.

Materials & Methods: The National Cancer Database was used to identify patients ≥65 years of age with renal cell carcinoma (clear cell, papillary, chromophobe, collecting duct or sarcomatoid histology) presenting with clinical M1 disease. Analysis was limited to patients with known clinical T1-4 and known clinical N0-2 status. Chemotherapy use, including targeted therapies, was defined as receipt of any (single or multagent) chemotherapy. The study was limited to years 2006-2013 to reflect the “targeted therapy” era of RCC management. Included patient characteristics were compared using chi-squared or t-tests as appropriate. Cox proportional hazards modeling was used to assess survival. All analyses were performed in Stata.

Results: The majority (86.3%) of adults over 65 with metastatic RCC received cytoreductive nephrectomy, while less than half (46.5%) received chemotherapy including targeted therapy (Table 1). On multivariate Cox regression analysis controlling for other factors, cytoreductive nephrectomy was associated with a hazard ratio of 0.746 [95%CI 0.65-0.85, p < 0.001], corresponding to a roughly 25% risk reduction of death from any cause-secondary to surgery (Table 2). Receipt of chemotherapy was not associated with significant risk reduction. Increasing age was associated with greater risk of death, with patients in the 75-79, 80-84, and ≥85 age groups demonstrating risk increases of 21-34% (Table 2). Other characteristics independently associated with risk of death included papillary, collecting duct or sarcomatoid histology; higher clinical T or N or stage; or treatment at a non-academic center (Table 2).

Conclusions: Performance of cytoreductive nephrectomy is significantly independently associated with survival in patients over 65 years of age. Patients in this population should be counseled on the benefits of cytoreductive nephrectomy, but care should be taken to ensure surgical risk in the setting of performance status in addition to clinical and oncologic factors.
Change in Stricture Length Following Urethral Rest
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Introduction: The 2017 AUA guidelines on male urethral strictures state surgeons may place suprapubic cystotomies (SPC) prior to urethroplasties to permit the full length of the urethral structure to develop. To our knowledge, there are no studies looking at the evolution of urethral structure after urethral rest with SPCs in place. Our goal was to document the change in stricture length before and after SPC placement.

Materials & Methods: Charts of patients undergoing urethroplasty by a single surgeon (KM) between 1/2007 and 3/2017 were reviewed. Patients who had retrograde urethrograms (RUG) prior to and at least 3 weeks post SPC were included in the study. Statistics were completed using Microsoft Excel.

Results: 16 patients with 18 strictures were identified who had pre- and post-SPC RUG. The mean stricture length pre-SPC was 3.0 cm (range 0.8-9 cm) [Table 1]. The mean stricture length post-SPC was 2.7 cm (range 1.4-5 cm). The mean time of urethral rest prior to repeat RUG was 48 days (range 24-120 days). 33% (6) of the strictures had no change in length, 23% (6) increased in length and 28% (5) decreased in length. Two of the strictures became obliterator after urethral rest. All of the strictures that increased in length were in the bulbar urethra. The mean increase in length was 0.7 cm (range 0.5-1.5) and the mean decrease in length was 1.8 cm (0.5-5).

Conclusions: The length of urethral strictures changes after SPC placed for urethral rest. Bulbar urethral strictures were they only type that increased in size after SPC. This is an important distinction as an increase in bulbar stricture length could change operative technique from an excision and primary anastomosis to a tissue transfer repair. Preoperative SPC should be considered to allow the stricture to develop itself as stricture length is essential to choice of urethroplasty type.

Optimizing Waiting Duration for Renal Transplants in the Setting of Renal Malignancy: Is Two Years Too Long to Wait?
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Introduction: For potential renal transplant recipients, waiting duration is a significant, modifiable risk factor affecting survival. For patients with end-stage renal disease (ESRD) also affected by cancer, a waiting period is commonly imposed prior to transplant. However, no evidence based universal recommendations currently exist to guide clinicians. We aim to improve decision making by evaluating the impact of waiting duration on cancer-specific mortality (CSM), non-cancer-specific mortality (NCSM), and overall survival (OS) in kidney cancer patients awaiting renal transplant.

Materials & Methods: The United States Renal Data System (USRDS) was used to identify patients with a known cause of ESRD from the period 1983 to 2007. Evaluation of OS was performed with Kaplan-Meier estimates and Cox Proportional Hazards models. Fine-Gray competing risk models were used to assess CSM and NCSM.

Results: Of 1,374,175 patients with known causes of ESRD, 228,984 (16.7%) received a transplant. Transplant recipients with renal malignancy associated ESRD (RM-ESRD) had longer waiting durations than those with other known causes of ESRD (2.4 vs. 1.3 years, p < 0.0001). RM-ESRD patients who had shorter waiting durations (0-2 years) had better overall survival than those who waited longer (2+ years) (10-year OS 69.0% vs. 46.7% respectively; p < 0.0001), with similar CSM (10-year CSM of 10.3% vs. 10.2% respectively, p = 0.88), while NCSM was worse for those with longer waiting durations (10-year NCSM of 20.7% vs. 44.8% respectively; p < 0.0001). RM-ESRD with shorter wait time to transplantation had similar OS to other causes of ESRD, while those who waited longer had worse OS due to worse NCSM (see figure). In Cox modeling, the status of RM-ESRD was not a significant predictor (p = 0.07), while longer waiting duration remained significant (p < 0.0001).

Conclusions: We found that longer waiting durations were associated with worse outcomes for patients with RM-ESRD. We found that CSM was not affected by waiting duration, while NCSM significantly improved with shorter wait time. These findings suggest that the overall survival of potential transplant recipients with RM-ESRD may be improved by reducing waiting duration. Further prospective trials evaluating this are warranted.

Effect of Urethroplasty on Anxiety and Depression
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Introduction: To our knowledge, anxiety and depression (AD) in patients with urethral stricture disease (USD) and the impact of urethroplasty has never been explored. We hypothesize that patients with USD undergoing urethroplasty will have an improvement in their AD.

Materials & Methods: Patients undergoing anterior urethroplasty were retrospectively reviewed from a multi-institutional reconstructive urology database. Patient demographics and stricture characteristics were recorded. Pre- and postoperative AD was recorded using the validated Eq-5d Questionnaire. Patient evaluation of overall health (scale of 1-100 with 100 representing perfect health) and sexual function (International Index of Erectile Function. IIEF) was performed. Stricture recurrence was defined as the need for subsequent procedure. Patients were excluded if they were missing any or post-operative data. Outcomes were analyzed with chi-square, Fisher’s exact, and Student’s t-tests or ANOVA as appropriate.

Results: 298 patients met inclusion criteria with median post-op survey completion follow-up time of 4.2 months. Of the 298 patients, 86 (29%) reported preoperative AD. This group was found to have a higher rate of marijuana use, worse preop IIEF score (17.5 vs. 19.6, p = 0.01), and lower image of overall health (66 vs. 79, p = 0.001). USD etiology was not a risk factor for pre-operative AD. Improvement or resolution of AD was experienced by 48 out of 86 patients (56%). These patients reported a significantly more optimistic preoperative image of overall health compared to those who had new or worsened AD (72 vs. 56, p = 0.001). New-onset AD was reported in 21 patients (10%). New-onset AD patients were older (54 vs. 46 years, p = 0.03) and had a lower preop IIEF score compared to patients with existing AD (64 vs. 80, p = 0.002). New-onset AD patients had a decreased postop max flow rate compared to patients who did not have new onset AD (16 ml/sec vs. 25 ml/sec; p = 0.01). Three patients with AD (4%) had a worsening of their AD. Stricture recurrence occurred in 8 patients (2.7%) and had no effect on the development, improvement, or resolution of AD.

Conclusions: 56% of patients with preoperative AD reported improvement or resolution after urethroplasty. Although new onset AD was rare, these patients had a significantly lower postoperative max flow rate, possibly representing a group with a perceived suboptimal surgical outcome. Items within a USD specific questionnaire that assess AD will further enable surgeons to better understand the interplay between USD and AD.
Retrograde Urethrogram Findings and Urethral Stricture Recurrence
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Introduction: Retrograde urethrograms (RUG) have been utilized 2-3 weeks after urethroplasty to help guide management of indwelling urethral catheters. To our knowledge, there is no published data to guide RUG interpretation. Our goal was to classify post-operative RUG findings and determine if they predicted restricting of the urethra.

Materials & Methods: All available post-urethroplasty RUGs between 4/1/2005 to 6/1/2016 were reviewed by one author (KSM). Results were classified into four categories: normal, contour irregularity, contained extravasation and frank extravasation (figure 1). Stricture recurrence was defined as symptoms with inability to pass a 16 French flexible cystoscope or evidence of stricture on subsequent RUG. Basic diagnostics were examined looking at sensitivity, specificity and association using SAS.

Results: 105 patients were included (table 1). Median follow up from time of post-operative RUG to last known follow up was 35 months (range 6-130 months). Findings of contour irregularity or contained extravasation on RUG were not associated with an increased risk of subsequent stricture. Frank extravasation had 50% positive predictive value (PPV) for subsequently developing a recurrent stricture at location of surgery. The sensitivity was 27% and specificity was 93%, with an increased odds ratio of 7 for developing a subsequent stricture.

Conclusions: Frank extravasation on post-operative RUG had a high specificity for predicting recurrence of urethral stricture and a PPV of 50%. In these patients, it has been our practice to replace the catheter until RUG findings resolve. The catheter was not replaced for intermediate RUG findings of contour irregularity and contained extravasation. As these data show intermediate RUG findings were not predictive of recurrent stricture, there is no indication that prolonged catheterization in this population could improve restructure rates.