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## A Surgical Risk Calculator For Complications From Robotic Assisted Partial Nephrectomy

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**Introduction:** Robotic assisted partial nephrectomy (RAPN) is a commonly performed to treat localized renal masses. Preoperative counseling of patients should include estimation of postoperative risk.

**Materials & Methods:** 1837 consecutive RAPN procedures were identified from a database from 5 academic institutions. Preoperative characteristics including gender, age, body-mass index (BMI), anesthesia risk (ASA) score, Charlson comorbidity index (CCI), tumor imaging, solitary kidney status, previous abdominal surgery, and renal function were used to model risk of any reported complication. Comparisons between patients with versus without complications were performed using chi-square tests for categorical data, and t-tests or non-parametric alternative Wilcoxon sum rank test for continuous data. Multivariable analyses to predicting complication were performed using logistic regression model.

**Results:** On univariate analysis, age > 70 (OR = 2.45, 95% CI 1.17-5.13, p = 0.017), ASA 3-4 (OR = 1.61, 95% CI 1.22-2.13, p value = 0.0008), CCI (OR = 1.29, 95% CI 1.19-1.39, p value < .0001), Preoperative tumor size ≥ 4 cm (OR = 1.60, 95% CI 1.08-2.36, p value = 0.019), Solitary kidney (OR = 1.88, 95% CI 1.00-3.52, p value = 0.050), preoperative GFR (OR = 0.99, 95% CI 0.98-1.00, p value = 0.045) and preoperative Creatinine (OR = 2.12, 95% CI 1.47-3.07, p value < .0001) were associated with an increased complication incidence. On multivariate logistic regression analysis, CCI and preoperative tumor size are the only 2 significant predictors of complication (AUC = 0.664). Increasing CCI by 1 increased the complication risk almost 1.5 fold. The risk of complication for patients with tumor size ≥ 4 cm are almost 2 times than that of patients with tumor size < 2 cm.

**Conclusions:** Preoperative patient characteristics should be used to counsel patients about postoperative risks. Using a multi-institutional cohort of patients, we offer a realistic assessment of postoperative risk.

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## Association of Modifiable and Non-modifiable Risk Factors with Perinephric Adipose Tissue: Implications for Partial Nephrectomy

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**Introduction:** Increased perinephric adipose tissue (PAT) is correlated with increased surgical complexity. Risk factors for its accumulation are not well understood. Identifying such risk factors may be important for patient selection and in managing surgical expectations.

**Materials & Methods:** PAT was prospectively quantified on axial imaging by measuring its area at the level of the hilum. Wilcoxon and Chi-square univariate analyses and linear model or logistic regression multivariable analyses were performed to identify associations with PAT.

**Results:** Median PAT area was 29.1 cm<sup>2</sup>, 20% of our cohort had adherent PAT. Univariate analysis identified male gender, age > 60, presence of DM2 or HTN, higher BMI, ASA score > 2 and presence of metabolic syndrome to predict greater amounts of PAT. On multivariate analysis the presence of metabolic syndrome remained a significant predictor of PAT amount and confirmed that PAT amount greater than 30 mm<sup>2</sup>, male gender, age greater than 60 and higher BM correlate with presence of adherent fat. Increased PAT as well as presence of adherent PAT were significant predictors of operating room time, but not of major (Clavien grade 3-5) or overall complications, warm ischemia time or length of stay.

**Conclusions:** Non-modifiable risk factors such as age and gender, as well as modifiable risk factors, such as HTN, DM2, and BMI are associated with increased amounts of PAT, thereby increasing the complexity and duration of partial nephrectomy. The presence of metabolic syndrome is associated with increased PAT, a finding not previously described, and should be considered during complex partial nephrectomy counseling.

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## International MultiCenter Experience with Early Unclamping Technique during Robotic Partial Nephrectomy

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**Introduction:** One method to decrease ischemia time during robotic partial nephrectomy (RPN) is through removal of the hilar clamp immediately after suturing the tumor bed, and performing the remainder of the renorrhaphy “off clamp”: the early unclamping technique (EU). This approach has the potential for increased blood loss however, it may offer improved visualization and suture control of arterial bleeders after clamp removal. Our study evaluates whether this technique is safe and reproducible by a group of international academic surgeons.

**Materials & Methods:** 680 patients at 7 institutions underwent EU RPN between 2009-2014. This dataset represents the initial EU RPNs performed by this group. Our prospective database was queried to evaluate surgical results.

**Results:** None of the 680 patients required re clamping after EU. The median warm ischemia time was 14.4 min (range 2-50 mins), median RENAL score was 7 (range 4-12), median tumor size was 3.1 cm (range 0.5-10.5 cm), median operative time was 173 mins (range 60-581 mins and median blood loss was 249 mL/s (range 5-1800 mL/s). 75/680 patients required blood transfusion (16% in first half of our experience and 6% in the second half). Overall complication rate was 23% with 6% Clavien grade III or more. In 93% of cases, WIT was ≤ 25 minutes. Overall positive margin rate was 5%.

**Conclusions:** Early unclamping during RPN is a safe and reproducible technique that may allow for decreased WIT without excessive overall morbidity. As with all RPN techniques, increased experience and surgical volume will improve results.

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## A Prospective, Non-Randomized Comparison of Open versus Robotic Radical Prostatectomy With 10-Year Follow Up

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**Introduction:** The advantages and disadvantages of open radical prostatectomy (ORP) or robotic-assisted laparoscopic radical prostatectomy (RALP) continue to be debated. Given the relative novelty of RALP, long term comparison studies are lacking. In 2004, we conducted a prospective, non-randomized study of RALP versus ORP. We now present 10-year follow up data assessing perioperative outcomes, long term urinary and sexual function, biochemical recurrence, and mortality between patients undergoing ORP or RALP.

**Materials & Methods:** ORP and RALP procedures were performed by a fellowship trained, different, single surgeon. Quality of life data were obtained with self-administered EPIC-26 questionnaires. Preoperative/operative/postoperative data, pathology, biochemical recurrence, mortality, and quality of life outcomes over a 10-year period were obtained and compared between ORP and RALP patients.

**Results:** Median follow up was 10.2 years. RALP and ORP had significantly different risk factors. RALP had longer operative times, shorter hospital stays, and higher discharge hematocrits. Accounting for PSA, Gleason score, and stage with multivariate analysis, there were no differences in margins, incidence or time to biochemical recurrence. In the RALP group, 96% of men were continent and 49% were potent versus 92.6% and 41.5% in the ORP group (p = 0.72 and 0.377). Urinary and sexual bother were not significantly different among RALP and ORP (p = 0.374 and 0.943).

**Conclusions:** RALP offers long term oncologic and quality of life outcomes equivalent to those of ORP.

|   | Prostatectomy technique |                     | p value |
|---|-------------------------|---------------------|---------|
|   | Open                    | Robotic             |         |
| Number of cases (n%)                        | 63 (32.2)               | 119 (61.8)          | -       |
| Diagnostic PSA (median(IQR) (ng/ml)         | 5.1 (4.2-6.3)           | 5.2 (4.1-6.5)       | 0.297   |
| Pathologic Gleason (n%)                     | 56 (11 (17.5)           | 61 (44.0)           | <0.001* |
|   | 7 (27.4)                | 63 (44.3)           | -       |
|   | 2 (3.2)                 | 2 (1.7)             | -       |
| T stage (n%)                                | 43 (71.4)               | 97 (83.0)           | 0.054   |
|   | 18 (28.6)               | 19 (16.4)           | -       |
| Operative time (mean ± SD) (min)            | 190(23)                 | 246(42)             | <0.001  |
| Positive margins (n%)                       | 26 (41.3)               | 31 (26.7)           | 0.046   |
| Length of stay (median(IQR) (days)          | 2 (2-3)                 | 2 (1-2)             | <0.001  |
| Discharge hematocrit (median(IQR)           | 32.3 (29.5-34.5)        | 35.1 (33.2-37)      | <0.001  |
| Complications (n%)                          | 7 (11.1)                | 16 (13.8)           | 0.609   |
| Gleason score (n%)                          | 53                      | 84 (3.3)            | 1.0     |
| Recurrence within 10 years (n%)             | 17 (27.0)               | 17 (14.7)           | 0.045   |
| Time to recurrence (months) (mean, 95% CI)  | 98.2 (85.7-110.8)       | 114.4 (105.3-123.6) | 0.016   |
| Mortality (deaths at 10 years) (n%)         | 4 (8.3)                 | 7 (6)               | 1.0     |
| Continence <sup>†</sup> (Yes) (n%)          | 50 (79.6)               | 66 (56.0)           | 0.720   |
| Potency <sup>†</sup> (Yes) (n%)             | 22 (41.5)               | 49 (40.0)           | 0.377   |
| Follow up time (median(IQR) (years)         | 10.3 (8.7-10.6)         | 10.1 (8.4-10.5)     | 0.172   |
| EPIC-26 bother score at 10 yrs (median(IQR) | 100 (75-100)            | 100 (75-100)        | 0.374   |
|   | 75 (25-100)             | 75 (25-100)         | 0.943   |

\*p value for Gleason 6 vs. >7

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## Robotic Intervention of Bladder Diverticula

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**Introduction:** Robotic assisted bladder diverticulectomy (RABD) has been associated with good outcomes, shorter hospital stays and less blood loss than open procedures.

**Materials & Methods:** We reviewed our RABD experience between July 2009 and October 2014. These included cases with multiple diverticula and concomitant procedures. Diverticula were approached transvesically by opening the bladder at midline. Diverticula with known tumor were packed with surgical sponge through the diverticular neck. Ureteroneocystostomy was performed when the ureter descended near the diverticular neck. With para-ureteral diverticula, retro-ureteral instillation of indocyanine green (ICG) was used for ureteral identification using near-infrared fluorescence (NIRF).

**Results:** 19 patients underwent RABD. Three RABDs were performed as a sole procedure and three involved multiple diverticula. Fourteen RABDs were performed in conjunction with simple or radical prostatectomy and two in combination with radical prostatectomy and partial or total nephrectomy. Four cases used ICG. Of the three patients who were catheter dependent and five who self-catheterized, all were able to spontaneously void postoperatively. Malignancy was identified in three patients including invasive adenocarcinoma, carcinoma in-situ and non-invasive high-grade urothelial carcinoma. Average follow up was 27 months with no carcinoma recurrences.

**Conclusions:** RABD is a safe and feasible technique. Concomitant procedures can be performed to treat chronic bladder outlet obstruction at time of diverticulectomy. Use of intra-ureteral ICG under NIRF guidance helped avoid ureteral injury during complex para-ureteral diverticulectomy dissection.

| Mean RABD Series Peri- and Post-Operative Data (N=19, 18 males and 1 female) |                                     |
|--|-------------------------------------|
| Age  | 66.2 years (50-85)                  |
| BMI  | 26.98 kg/m <sup>2</sup> (20.6-31.2) |
| Diverticulum Diameter  | 6.22 cm (1-15)                      |
| Console Time   | 200 minutes (64-290)                |
| EBL  | 172 ml (20-400)                     |
| Length of Stay   | 2.3 days (2-4)                      |
| Catheter Duration  | 7.74 days (5-17)                    |
| Pre-Operative PVR  | 428 mL (220-738)                    |
| Post-Operative PVR   | 41 mL (0-85, p < 0.001)             |
| Pre-Operative AUA-SS (N=12)  | 17.125 (6-28)                       |
| Post-Operative AUA-SS (N=12)   | 2.83 (0-8, p < 0.001)               |

AUA-SS: American Urological Association Symptom Score  
PVR: Post Void Residual

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## Initial Experience in Intracorporeal Ileal Conduit Creation after Robotic Cystectomy: Feasibility, Outcomes, and Learning Curve

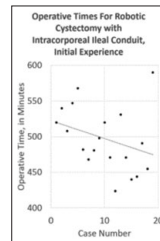
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**Introduction:** Intracorporeal urinary diversion after robotic cystectomy is currently limited to highly-specialized centers. Information regarding the initial experience of starting a program in totally robotic radical cystectomy is sparse.

**Materials & Methods:** Prior to program initiation, two fellowship-trained attending surgeons with robotic cystectomy experience observed intracorporeal ileal conduit creation at a high-volume center, and subsequently performed all operations together as a team. We recorded peri-operative outcomes, complications (Clavien classification), and operative times for each case step. Linear regression trended operative times with experience.

**Results:** From 2013-2015, we performed 24 totally robotic radical cystectomies. 10 patients had neoadjuvant chemotherapy; 3 had prior radiation. Mean lymph nodes examined was 25 (range 11-72). Mean EBL was 386 mL. Median hospital stay was 6 days; 58% stayed < 7 days. Overall complication rate was 62%; major (Clavien ≥ 3) complication rate was 29%. For 19 patients with granular operative time information, mean operative time from induction to close was 468 minutes. Operative times for the right (-1.1 min/case) and left (-0.8 min/case) ureteroileal anastomoses, urostomy (-0.8 min/case), and the total operation (-2.5 min/case) decreased with experience.

**Conclusions:** With sufficient expertise, starting a program in totally robotic radical cystectomy is feasible, with outcomes similar to the reported literature. Given long operative times and high complexity, we recommend a team approach. A significant learning curve exists; operative times decrease with experience.



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## Bi-Institutional Comparison of Robotic-Assisted Laparoscopic versus Open Ureteroureterostomy in the Pediatric Population

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**Introduction:** Ureteroureterostomy (UU) is a useful surgical option for the management of duplication anomalies and obstructed single systems. We aimed to evaluate the safety, efficacy, and outcomes of robotic-assisted laparoscopic UU (RALUU) compared to open UU (OUU) in children.

**Materials & Methods:** A retrospective review was performed at two institutions including six surgeons' experience with all cases of RALUU and OUU from January 2005 to June 2014. Indications for surgery included duplex systems with an upper pole ectopic ureter, obstructed ureterocele or lower pole vesicoureteral reflux, and obstruction in a single system. Transureteroureterostomy, laparoscopic UU, and major reconstruction cases where UU was the secondary procedure were excluded.

**Results:** 25 RALUU and 19 OUU cases were included, Table 1. RALUU were more likely to be performed proximally (p = 0.01) and with the use of cystoscopy and stent placement (p = < 0.0001). Post-operative complications included four febrile urinary tract infections in each group, one recurrence of non-febrile urinary tract infection in the open group, and one post-operative obstruction at the ureterovesical junction requiring nephrostomy tube placement in the open group. RALUU had shorter hospital stays (p = 0.04) and higher rates of hydronephrosis resolution/improvement or improved drainage compared to OUU on initial follow up imaging (p = 0.01).

**Conclusions:** RALUU is a safe alternative to OUU in children with duplication anomalies and single system obstructed ureters. Operative times, length of hospitalization, success rates, and complication rates were comparable.

Table 1. Patient demographics, surgical technique, and outcomes.

|  | RALUU (n = 25) | OUU (n = 19) | p value  |
|--|----------------|--------------|----------|
| <b>Patient demographics</b>                            |                |              |          |
| Mean age (years)                                       | 6.15.1         | 3.94.3       | 0.18     |
| Males: females   | 1:2.6          | 1:2.8        | 0.89     |
| Mean weight (kg)                                       | 23.523.3       | 17.712.2     | 0.27     |
| <b>Indication for surgery</b>                          |                |              |          |
| Ectopic ureter   | 18 (72%)       | 10 (53%)     | 0.19     |
| Obstructed ureterocele                                 | 3 (12%)        | 4 (21%)      | 0.68     |
| Lower pole vesicoureteral reflux                       | 0 (0%)         | 3 (16%)      | 0.07     |
| Ureteral stricture/stenosis                            | 4 (16%)        | 2 (11%)      | 0.68     |
| <b>Surgical technique</b>                              |                |              |          |
| <i>Side</i>  |                |              |          |
| Left   | 11 (44%)       | 11 (58%)     | 0.36     |
| Right  | 13 (52%)       | 7 (37%)      | 0.32     |
| Bilateral  | 1 (4%)         | 1 (5%)       | 0.99     |
| <i>Ureteral anastomosis</i>                            |                |              |          |
| Upper to lower ureter                                  | 23 (92%)       | 16 (84%)     | 0.64     |
| Lower to upper ureter                                  | 0 (0%)         | 3 (16%)      | 0.07     |
| Proximal to distal ureter                              | 2 (8%)         | 0 (0%)       | 0.50     |
| <i>Location</i>  |                |              |          |
| Proximal   | 16 (64%)       | 5 (26%)      | 0.01     |
| Mid  | 1 (4%)         | 2 (11%)      | 0.57     |
| Distal   | 8 (32%)        | 12 (63%)     | 0.04     |
| Cystoscopy included                                    | 25 (100%)      | 4 (21%)      | < 0.0001 |
| Use of stent   | 25 (100%)      | 8 (42%)      | < 0.0001 |
| Mean stent duration (days)                             | 18.812.2       | 26.730.4     | 0.52     |
| Need for second procedure for stent removal            | 6 (24%)        | 4 (21%)      | 0.99     |
| Use of penrose drain                                   | 0 (0%)         | 14 (74%)     | < 0.0001 |
| <b>Outcomes</b>  |                |              |          |
| Mean operative time (minutes)                          | 158.048.5      | 176.793.8    | 0.49     |
| Mean cystoscopy time (minutes)                         | 27.719.2       | 16.77.6      | 0.10     |
| Mean total operative time (minutes)                    | 186.352.7      | 161.558.5    | 0.17     |
| Mean estimated blood loss (mL)                         | 6.45.6         | 8.110.6      | 0.54     |
| Mean length of hospital stay (days)                    | 1.60.7         | 2.10.8       | 0.04     |
| <b>Complications (Based on Clavien classification)</b> |                |              |          |
| Grade 1  | 0 (0%)         | 0 (0%)       | 0.99     |
| Grade 2  | 4 (16%)        | 5 (26%)      | 0.47     |
| Grade 3  | 0 (0%)         | 1 (5%)       | 0.43     |
| Grade 4  | 0 (0%)         | 0 (0%)       | 0.99     |
| <b>Hydronephrosis or drainage on follow up imaging</b> |                |              |          |
| Resolved/improved                                      | 22 (88%)       | 10 (53%)     | 0.01     |
| Stable   | 2 (8%)         | 5 (26%)      | 0.21     |
| Worse  | 0 (0%)         | 1 (5%)       | 0.43     |
| No imaging   | 1 (4%)         | 3 (16%)      | 0.30     |
| Mean time of imaging following surgery (weeks)         | 10.211.9       | 7.95.0       | 0.42     |
| Mean follow up (months)                                | 16.418.0       | 11.614.1     | 0.30     |

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**Renal Masses with a Non-diagnostic Percutaneous Biopsy Still Have a Significant Risk of Malignancy**

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**Introduction:** A non-diagnostic (ND) renal mass biopsy (RMB) presents a clinical dilemma for the clinician and patient. We report the outcomes of our patients with non-diagnostic RMBs.

**Materials & Methods:** We retrospectively reviewed our single-institutional database of 1233 RMBs performed between 1998-2012 to identify non-diagnostic RMBs. ND pathology was defined as a report of (1) renal/non-renal tissue not representative of the lesion, (2) insufficient specimen. Rebiopsy, ablation, and surgery were defined as immediate if within 6 months of initial biopsy and without interval growth on CT. Subsequent outcomes after ND RMB were analyzed.

**Results:** Among 1233 RMBs performed, 266 (22%) were ND. Of these, 129 were solid and 137 were cystic. Mean lesion size was 2.94 cm (SD = 2.25). Of 266 ND biopsies, 91 (34%) underwent immediate intervention (rebiopsy, surgery, or ablation), 148 (56%) were placed under surveillance, and 27 (10%) were lost to follow up. Among those on surveillance 19 (13%) ultimately underwent intervention, 1290 (87%) remained stable over median follow up of 3.2 years (IQR 1.1-4.3). Mean tumor size in the immediate intervention group was 3.50 cm (SD = 2.6) versus 2.59 cm (SD = 1.7) in the surveillance group (p = 0.0038). Of those undergoing immediate intervention 57.1% (52/91) of lesions were solid compared to 44.6% (66/148) on surveillance (p = 0.0596). Ultimately, conclusive histopathology was available for 61 ND cases (36 rebiopsy, 25 surgery): 50 (82%) were malignant (47 renal cell carcinoma, 2 transitional cell carcinoma, 1 metastases), 11 (18%) were benign neoplasms.

**Conclusions:** A non-diagnostic RMB does not imply absence of malignancy. Immediate intervention or close surveillance imaging must be performed to establish tissue diagnosis or clinical behavior of lesions in patients with a non-diagnostic biopsy.

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**Risk Factors for Disease Progression and Cancer-Specific Mortality in Patients with G3T1 Transitional Cell Carcinoma of the Bladder**

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**Introduction:** There is uncertainty regarding optimal management of patients with Grade 3, T1 (G3T1) transitional cell carcinoma (TCC) of the bladder. Here, we review our series of patients with G3T1 TCC and identify risk factors for mortality and disease progression.

**Materials & Methods:** 156 patients were confirmed to have G3T1 TCC without muscle invasion or nodal/metastatic progression. Disease progression was defined as the subsequent invasion of cancer into the muscularis propria or deeper, adjacent organs, or spread to distant sites. Conservative management entailed TURBT with intravesical BCG. Risk factors for progression and mortality, such as carcinoma in situ (CIS) and lymphovascular invasion (LVI), were assessed.

**Results:** Mean age was 68 years (28-89 years) with median follow up of 76 months (1-141 months). Cystectomy was performed in 54 patients; 19 as primary therapy and 35 for disease progression. CIS was associated with higher rates of disease progression (5 yr: 68% versus 32%, p < 0.0001), as was LVI (5 yr: 74% versus 37%, p < 0.0001). On multivariable analysis, both CIS and LVI were associated with disease progression (HR 2.69 and HR 2.65, respectively, both p < 0.0001). CIS and LVI also conferred a worse 5 yr cancer-specific mortality (CIS: 63% versus 33%, p = 0.0004; LVI: 53% versus 47%, p = 0.04), which was confirmed with multivariable analysis (CIS: HR 2.6, p = 0.0005 and LVI: HR 2.7, 0.0002).

**Conclusions:** High-risk features such as CIS and LVI are associated with disease progression and cancer-specific mortality in patients with G3T1 TCC. Despite initial cystectomy, patients with G3T1 TCC were at risk for surgical upstaging and subsequent metastases.

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**PET Prostate Imaging with VPAC1**

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**Introduction:** Vasoactive Intestinal Peptide and Pituitary Adenylate Cyclase Activating Peptide Receptor 1 (VPAC1) is over-expressed in prostate cancer (PC), representing a target for imaging and treatment. VPAC1 expression occurs before alterations of cell morphology or PSA elevation. We hypothesized that VPAC1 overexpressed on PC can be target tumor foci, using TP3805, a VPAC1 specific biomolecule labeled with Cu-64.

**Materials & Methods:** Twenty five men undergoing radical prostatectomy were imaged preoperatively on a PET protocol targeting VPAC1. The PET images were compared to whole mount prostatectomy specimens. We performed digital autoradiography with Cu-64-TP3805 on two patients who participated in VPAC1 PET imaging, as well as 3 BPH patients, one malignant lymph node and one benign lymph node. Autoradiography was compared with prostate pathology in which tumor foci were delineated.

**Results:** Prostate cancer foci (n = 30/31) were identified by autoradiography. Autoradiography missed one malignant lesion due to technical artifact. Additionally 6 small cancerous lesions were identified that were not noted by histologic examinations. Seven additional lesions on autoradiography were in areas of HGPN. The malignant and benign lymph nodes were correctly identified by autoradiography. No lesions were noted by autoradiography on the three BPH patients.

**Conclusions:** VPAC1 peptide analog constructs accurately identified foci of prostate cancer on whole mount prostatectomy specimens. Several additional lesions were also identified. Detection of HGPN is consistent with the early expression of VPAC1 prior to the modulations in cell morphology. The PPV (97%) and NPV (100%) were excellent, validating VPAC1 as a potential theranostic target for prostate cancer imaging and treatment.

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**Effects of Local Tumor Ablation on the Immune Response at Distant Tumors**

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**Introduction:** The complexity of aggressive cancers implies that they may only be eradicated by adaptable systems (such as the immune system). Immuno-modulators have efficacy in immunogenic malignancies but less benefit in prostate cancer. Here we study whether various local therapies may augment the immune response to distant tumors in a prostate cancer model.

**Materials & Methods:** Immuno-competent FVB mice were injected bilaterally with MycCaP cells to establish sub-cutaneous grafts. After establishment, the larger graft was treated by cryoablation, cautery, radiation (10 Gy) or en bloc excision. Mice were followed for 36 days, tumors were measured every 2 to 3 days, mice were sacrificed when tumors reached 2000 mm<sup>3</sup> or had tumor ulceration. In a second experiment an identical procedure was followed with mice sacrificed at 2 and 4 weeks and harvested for flow cytometry and IHC.

**Results:** All ablative therapies increased survival compared to control (p < 0.05). Treatment of tumors by cryotherapy or cautery resulted in the longest median survival (34 days versus 25 for excision or radiation versus 12 days in control) and greatest delay in onset of exponential growth in the untreated distant tumor. All therapies increased CD3 positive cells in distant tumors. Cryotherapy and cauterization of a tumor increased the amount of IL-2 positive CD4 cells and IFNgamma positive CD8 cells in the distant tumor.

**Conclusions:** Local therapies, and particularly cryoablation and cauterization demonstrate potential systemic effects on anti-tumor immunity and may act as putative adjuncts to immuno-therapies for prostate cancer.

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**The Clinical Impact of Histologic Variants on Outcomes of Bladder Cancer: A Population-based Analysis**

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**Introduction:** We evaluated the clinical and prognostic impact of bladder cancer histologic variants using a large population-based database.

**Materials & Methods:** Using the Surveillance, Epidemiology, and End Results database (SEER), we identified bladder cancer patients from 2001-2011, and categorized them according to histologic differentiation. Disease-specific survival (DSS) was calculated using the Kaplan-Meier method. Cox proportional hazards regression model was used to predict association with disease-specific mortality (DSM). In addition, we fitted multivariate logistic regression models to predict the impact of histologic variants on muscle-invasion (MI), nodal involvement (NI), and metastatic disease (MD).

**Results:** The cohort included 160885 urothelial (96.5%) and 5781 variants (3.5%). The latter were divided into: 2205 squamous, 1526 adenocarcinoma, 799 small cell, 462 spindle cell, 279 neuroendocrine, 270 signet-ring cell, and 240 micropapillary bladder tumors. Urothelial cancers overall had the best median DSS. Of the non-urothelial variants, micropapillary and squamous had the best and worst DSS respectively ( $p < 0.001$ ). On multivariable analysis predicting DSM, micropapillary and squamous variants had the best and worst prognosis respectively (HR 0.7,  $p = 0.049$  and HR 2.85,  $p < 0.001$ ), compared to urothelial tumors. On multivariable analysis predicting MI, NI, and MD: squamous (OR 22.42,  $p < 0.001$ ), signet-ring cell (OR 3.2,  $p < 0.001$ ), and adenocarcinoma (OR 5.15,  $p < 0.001$ ) had poorer prognosis respectively, compared to urothelial tumors.

**Conclusions:** Despite accounting for a minority of bladder cancers, non-urothelial variants are associated with worse outcomes. It is essential to recognize the potential implications of these variants when deciding treatment.

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**Incidence and Management of Non-muscle Invasive Bladder Cancer Recurrences after Complete Response to Combined-modality Organ-preserving Therapy for Muscle-invasive Bladder Cancer**

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**Introduction:** The incidence and optimal management of NMIBC recurrences after combined-modality therapy (CMT) for MIBC remains unclear. We sought to describe the incidence, management and outcomes of NMIBC recurrences in complete responders (CR) after CMT.

**Materials & Methods:** 333 patients with cT2-4aN0M0 MIBC who had a CR after CMT were reviewed retrospectively (1986-2012). Patients underwent concurrent chemotherapy and radiation therapy (chemoRT) after maximal transurethral resection of bladder tumor (TURBT). CRs, defined as those with a negative biopsy after 40 Gy RT, received boost chemoRT.

**Results:** A total of 70 (21%) CRs developed NMIBC with a mean follow up of 9.3 years. Median time to first NMIBC recurrence was 18 months (range 4-250). 20 (92%) NMIBC recurrences were considered "high risk" (HR) defined as cTaG2/G3, CIS, or T1. Treatment of first recurrence included TURBT alone (40%), TURBT/BCG (49%), TURBT/intravesical chemotherapy (6%), or radical cystectomy (6%). Among HR recurrences, 59% were treated with BCG and had no further recurrences. 68% of all patients who received BCG completed induction with minimal toxicity. The expected lifetime chance of recurrence after surviving 10 years without any recurrence was 20%. 5- and 10-year DSS for CRs without recurrences (81% and 79%, respectively) was comparable to those with NMIBC recurrences (84% and 77%, respectively) ( $p = 0.8$ ).

**Conclusions:** NMIBC recurrences can occur beyond a decade after CMT. NMIBC recurrences may be treated successfully with BCG and tolerability is comparable to that of non-irradiated patients. DSS for patients with NMIBC recurrences after CMT is comparable to those without recurrences.

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**Prospective Quality of Life Impact Analysis Following Localized Prostate Cancer Treatments: Brachytherapy, Cryotherapy, and Radical Prostatectomy Long Term Follow Up**

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**Introduction:** A number of treatments for localized prostate cancer (CaP) exist, often with similar oncologic outcomes. As such, health related quality of life (HRQOL) plays a significant role in treatment decisions. We sought to evaluate the long term HRQOL impact of four such treatments.

**Materials & Methods:** Patients undergoing open/robotic-assisted radical prostatectomy (ORP/RAP), brachytherapy (BT), or cryotherapy (CRYO) for localized CaP between March 2002 and October 2009 were asked to complete the UCLA-PCI pre-op and at 1, 3, 6, 12, 18, 24, 30, 36, 48, and 60 months post-op. 586/1094 patients returned surveys out to 60 months. Outcomes were compared across treatments. Baseline scores were obtained along with percent of baseline scores (PBS) for all subsequent surveys.

**Results:** For urinary function (UF) and bother (UB) domains, BT and CRYO showed significant improvement in HRQOL versus ORP or RAP, which persisted to the 60 months. BT and CRYO showed a faster return of HRQOL, plateauing by 6-12 months versus ORP and RAP which plateaued at 18-24 months. Sexual function (SF) and bother (SB) domains showed significantly improved HRQOL for BT over ORP, RAP, and CRYO. By 12 months, BT patients had roughly double the improvement of the others. BT, however, demonstrated a decline in SF after 36 months versus ORP, RAP, and CRYO which had stable SF over the same period.

**Conclusions:** In patients followed to 5 years, BT and CRYO offer durable HRQOL benefits in both UF and UB over ORP and RAP. BT alone offers improved HRQOL outcomes for SF as compared to ORP, RAP, or CRYO. These findings can be employed for appropriate counseling prior to treatment decisions.

15

**SPINK1 Defines a Molecular Subtype of Prostate Cancer with More Rapid Progression from Biochemical Recurrence to Death in an at Risk, Natural History Cohort**

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**Introduction:** Prostate cancer (PCa) is clinically and molecularly heterogeneous. Previous work has subtyped PCa on the basis of mutually exclusive genomic alterations in genes such as ERG, ETV1, SPINK1 or their lack thereof (i.e., 'Triple Negative', TN). These studies failed to find a link between these alterations and clinical outcomes. Here we evaluate the prognosis based on these PCa subtypes treated by radical prostatectomy with conservative follow up.

**Materials & Methods:** Men with NCCN intermediate-high risk localized prostate cancer treated with RP at the Johns Hopkins (1992-2010) with at least 5 years of follow up were identified. Only men with initial undetectable PSA after surgery and who received no therapy prior to metastasis detection were included. A case-cohort design was used to randomly sample two cohorts; one enriched with metastasis from the entire cohort ( $n = 319$ ) and one enriched with metastasis from the patients with BCR ( $n = 263$ ). We analyzed Affymetrix Human Exon 1.0 ST GeneChip expression profiles from the two cohorts to perform subtype classification of patient tumors as ERG+, ETS+, SPINK1+ or TN.

**Results:** Across the two cohorts, 36%, 12%, 9% and 43% of PCa were classified as ERG+, ETS+, SPINK1+, and TN. UVA shows that SPINK1+ tumors were more common in African Americans (OR: 1.7). In patients that developed metastasis, SPINK1+ had an HR of 3.1 ( $p < 0.01$ ) for prostate cancer-specific mortality.

**Conclusions:** SPINK1 overexpression is associated with faster time to PCSM in at risk men with biochemical and clinical recurrence following radical prostatectomy. ERG and ETS alterations are not prognostic for outcome.



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**Biopsy Proven Oncocytoma: In Situ Natural History and Clinical Outcomes of 109 lesions**

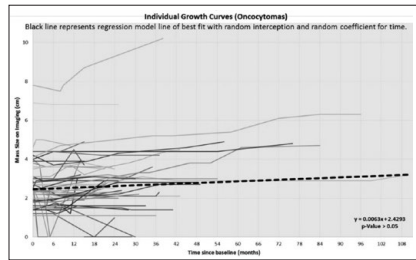
Dayron Rodriguez, Manish Dhyani, Sameer Deshmukh, Glen W. Barrisford, David Kuppermann, Anthony Samir, Ronald S. Arellano, Francis J. McGovern, Michael L. Blute, Adam S. Feldman  
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**Introduction:** The long term outcomes of renal oncocytomas and their natural history has not been well characterized. In this study we review the in-situ natural history and clinical outcomes of renal mass biopsy (RMB) proven oncocytomas at our institution.

**Materials & Methods:** We performed a retrospective review of our database of 1233 RMBs between 1998-2012. Lesions with a pathological diagnosis of oncocytoma on percutaneous biopsy were identified. Surveillance and follow up outcomes were assessed.

**Results:** A total of 109 lesions had pathological diagnosis of oncocytoma on image-guided (US: CT = 7:102) RMB. Median age was 72 years (range: 40-91 years) and 69/109 were male. The majority of lesions were solid (n = 106,97%) with a median size of 2.5 cm (range: 0.9-7.8 cm). A total of 54 lesions were followed with a minimum of one additional imaging study. 24 lesions were either stable or decreased in size during a mean 2.4 ± 2.1 years of follow up. Of the 30 lesions which grew in size the mean rate of growth was 0.38 cm/year. However, the mean rate of growth for the overall followed cohort was 0.07 cm/year. Two patients underwent RFA, 4 underwent nephrectomy, and 2 were re-biopsied.

**Conclusions:** This is the largest series of biopsy proven oncocytomas reported to date. Renal oncocytomas are slow growing. Our data suggests that lesions of this type with growth rates ≤ 0.3 cm/yr may be safely followed with serial imaging.



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**Underestimation of Prostate Cancer Risk at Diagnosis among African American Men**

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**Introduction:** Recent data suggest an underestimation of prostate cancer disease risk at diagnosis among AA men. We compared pre- and post-treatment estimates of prostate cancer risk, to determine whether inaccurate assessment of disease risk at diagnosis differs by race.

**Materials & Methods:** We identified Caucasian and AA men who underwent radical prostatectomy at our institution between 2012 and 2014. CAPRA and CAPRA-S scores were determined as estimates of pre- and post-operative disease risk. Differences between each patient's CAPRA and CAPRA-S scores were calculated. Underestimation of disease risk at diagnosis was defined as a CAPRA score less than CAPRA-S score.

**Results:** 255 men met inclusion criteria, including 162 Caucasian (64%) and 93 AA (36%) men. CAPRA and CAPRA-S scores are shown in Table 1, and did not differ significantly by race (CAPRA p = 0.77, CAPRA-S p = 0.29). Differences between each patient's CAPRA and CAPRA-S score are shown in Table 2. Risk underestimation occurred in 40% of AA men, compared to 25% of Caucasian men (p = 0.09). Multivariable logistic regression showed that AA race (p = 0.04) and younger age (p = 0.03) were associated with risk underestimation.

**Conclusions:** Underestimation of prostate cancer risk at diagnosis is more common in AA, compared to Caucasian men. These findings suggest a need for improved risk assessment at diagnosis, and argue for more aggressive treatment of prostate cancer in AA men.

**Table 1: CAPRA (Pre-op) and CAPRA-S (Post-op) Scores Categorized**

|                  | CAPRA     |         |    |         |       |         |
|------------------|-----------|---------|----|---------|-------|---------|
|                  | Caucasian |         | AA |         | Total |         |
|                  | N         | Percent | N  | Percent | N     | Percent |
| 0-2 (low risk)   | 73        | 46.8    | 33 | 46.5    | 106   | 46.7    |
| 3-5 (int risk)   | 62        | 39.7    | 26 | 36.6    | 88    | 38.8    |
| 6-10 (high risk) | 21        | 13.5    | 12 | 16.9    | 33    | 14.5    |
| Total            | 156       |         | 71 |         | 227*  |         |

\*28 patients with insufficient data to calculate CAPRA score

|                  | CAPRA-S   |         |    |         |       |         |
|------------------|-----------|---------|----|---------|-------|---------|
|                  | Caucasian |         | AA |         | Total |         |
|                  | N         | Percent | N  | Percent | N     | Percent |
| 0-2 (low risk)   | 94        | 58.0    | 43 | 47.8    | 137   | 54.4    |
| 3-5 (int risk)   | 41        | 25.3    | 28 | 31.1    | 69    | 27.4    |
| 6-12 (high risk) | 27        | 16.7    | 19 | 21.1    | 46    | 18.2    |
| Total            | 162       |         | 90 |         | 252*  |         |

\*3 patients with insufficient data to calculate CAPRA-S score

**Table 2: Differences Between Each Patient's CAPRA and CAPRA-S Scores**

|  | Caucasian |         | AA |         | Total |         |
|--|-----------|---------|----|---------|-------|---------|
|  | N         | Percent | N  | Percent | N     | Percent |
| CAPRA-S < CAPRA (risk overestimation)  | 81        | 51.9    | 30 | 42.9    | 111   | 49.1    |
| No Change                              | 35        | 22.4    | 12 | 17.1    | 47    | 20.8    |
| CAPRA-S > CAPRA (risk underestimation) | 40        | 25.6    | 28 | 40.0    | 68    | 30.1    |
| Total                                  | 156       |         | 70 |         | 226   |         |

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**Active Surveillance for Low Risk Localized Prostate Cancer in Men Under 60 Years of Age**

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**Introduction:** Active surveillance (AS) is increasingly used in managing low-risk prostate cancer. Data on outcomes of AS in younger men are limited. We present characteristics and outcomes of our AS cohort of men under age 60.

**Materials & Methods:** We reviewed our single-institutional AS database of 990 men diagnosed between 1997-2014 to identify 177 men under age 60. Guidelines for inclusion in AS at our institution include Gleason ≤ 6 (Gleason 3+4 in select patients with low volume), ≤ 3/12 cores positive with ≤ 20% in each core, PSA < 10.

**Results:** At diagnosis, median age was 56 years (IQR 53.1-57.7) and median PSA was 4.47 ng/mL (IQR: 3.00-5.60), with 173 of 177 below 10 ng/mL. 176 of 177 had Gleason 6 and 1 of 177 had Gleason 3+2 = 5. 92.7% (164/177) were T1c, 6.7% (12/177) T2a, and 0.6% (1/177) T1a. With a median follow up of 4.4 years (range: 0.5-17.0; IQR: 2.8-6.1), 85.9% (152/177) had a repeat biopsy with 61.8% (94/152) showing prostate cancer, 25.7% (39/152) benign, 7.2% (11/152) with PIN, and 5.3% (8/152) with atypia. Kaplan Meier actuarial freedom-from-treatment was 69.6% at 5 years. 28.3% (51) of all patients progressed to treatment for the following reasons: 68.6% (35/51) pathologic progression, 17.6% (9/51) PSA progression, 11.8% (6/51) patient preference, 2.0% (1/51) other reasons. Among treated patients, 72.5% (37/51) had surgery, 19.6% (10/51) had external beam radiation, and 7.8% (4/51) had brachytherapy. On pathologic review after surgery, 83.8% (31/37) were pT2, and 16.2% (6/37) pT3.

**Conclusions:** Active surveillance is a reasonable option for carefully selected men under 60 with low risk prostate cancer. Patients must be surveyed closely and understand the risk of ultimately needing treatment.

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**Identifying novel micro-RNA in Upper Tract Urothelial Carcinoma: Implications for Diagnosis, Management and Prognosis**

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**Introduction:** MicroRNAs (miRNAs) are promising cancer biomarkers; however, miRNA profiling of upper tract urothelial carcinoma (UTUC) tumors is largely unexplored. Concerns remain over accurate grading and staging of UTUC secondary to inadequate tissue sampling. Furthermore, accurate knowledge of the biology of these tumors would allow tailored treatment for patients who are not candidates for a nephroureterectomy (NU). We aimed to identify a miRNA expression profile which can differentiate low- and high-grade UTUC.

**Materials & Methods:** Total RNA was extracted from Formalin-fixed, paraffin-embedded samples from 2005 to 2013 under an IRB-approved study. NU samples were divided into low- and high-grade pools (n = 50) based on pathology. Sample pools from each group were profiled via miRNA RT-qPCR array and validation was performed on individual NU and biopsy samples.

**Results:** Array analysis of 752 miRNA identified 114 miRNA with > 2 fold differential expression between the low- and high-grade pools. Of these, 63 were up-regulated and 51 were down-regulated in the high-grade pool. Several miRNA were further validated by qRT-PCR on individual samples confirming differential expression. A number of these miRNAs have previously been implicated in aggressive bladder urothelial carcinoma.

**Conclusions:** We have identified miRNA which discriminate low- and high-grade disease in NU specimens. Several of these miRNA were differentially expressed in biopsy specimens which may enhance the diagnosis of UTUC. Furthermore, we are prospectively analyzing these miRNAs in urine to develop a non-invasive assay to detect UTUC. The miRNA expression profile may also aid in personalizing treatment and follow up based on tumor biology.

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**Short Term Outcomes of the Multi-Institutional Bladder Exstrophy Consortium: Successes and Complications in the First Two Years of this Continuing Medical and Surgical Education**

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<sup>1</sup>Boston Children's Hospital, Boston, MA; <sup>2</sup>Children's Hospital of Philadelphia, Philadelphia, PA; <sup>3</sup>Children's Hospital of Wisconsin, Milwaukee, WI

**Introduction:** With a focus on increasing experience and proficiency in the care of bladder exstrophy (BE), the Multi-Institutional BE Consortium (MIBEC) commenced in February 2013. Our objectives are to report short term outcomes and early lessons learned from this unique model of continuing surgical education.

**Materials & Methods:** Three institutions served as hosts with observation, commentary and critique by collaborating surgeons. Employing the MIBEC method and protocol, CPRE with bilateral iliac osteotomy was performed at 1-3 months of age facilitating parental bonding, genitalia development, and organ system maturation. Patients were prospectively followed for outcomes including complications.

**Results:** From February 2013-February 2015, MIBEC participants performed CPRE in 28 consecutive patients (23 classic BE, 5 epispadias). Thirteen girls and 15 boys underwent CPRE at median age of 2.27 months (0.13-51.62 months). There were no dehiscences, and 18 patients are without complications. One boy had a hypospadiac urethral meatus at CPRE completion. Six girls had at least 1 episode of pyelonephritis, 2 boys developed urethrocutaneous fistula, and 4 girls had varying degrees of urinary retention requiring temporary clean intermittent catheterization (CIC). Complete retention developed in 2 of these 4 girls; 1 with a stenotic bladder outlet will require diversion to vesicostomy, and 1 with meatal stenosis resulting in bladder rupture continues CIC after repair.

**Conclusions:** Technical refinement of CPRE remains an ongoing process. This collaborative model is feasible and can be transferred to other rare, complex surgical procedures to maximize and share collective expertise, standardize technique, and analyze outcomes to ultimately benefit patient care.

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**Timing and Incidence of Additional Operative Interventions after Endoscopic Treatment of Vesicoureteral Reflux (VUR)**

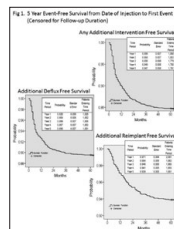
Liza M. Aguiar<sup>1</sup>, John H. Makari<sup>1</sup>, Anthony A. Caldamone<sup>2</sup>, Katherine W. Herbst<sup>1</sup>  
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**Introduction:** The purpose of this study was to better understand the long term success of endoscopic treatment of primary VUR by estimating the incidence and timing of additional interventions.

**Materials & Methods:** We queried the Pediatric Health Information System database for patients whose records contained both an ICD-9 code for VUR (593.7) and a CPT code for endoscopic injection (52327) between 9/30/2007 - 9/30/2009. Patients with secondary VUR, prior VUR interventions, or > 18 years were excluded. Subject's records were searched forward through 9/30/2014 to identify additional VUR interventions. Kaplan-Meier curves were constructed, with proxy follow up defined as time of initial injection to end of study period.

**Results:** Two thousand seventy eight (2,078) subjects were identified with median follow up of 5.75 years (range 5.0-6.9 years). 15.4% underwent additional procedure(s) (9.2% injection, 4.8% reimplantation, 1.3% injection, then reimplantation). Median time to second injection was 6 months (IQR 4-15 months) and to reimplantation was 11 months (IQR 5-21 months). There was a 10.1% probability of undergoing any re-intervention by 1 year, which increased to 15.3% by 5 years, Figure 1.

**Conclusions:** Acknowledging limitations of administrative data, including the inability to determine procedure laterality and to capture patient migration, these data indicate that the re-intervention rate after endoscopic treatment of VUR is at least 15.4%. While most re-interventions occur within the first year, additional procedures occur up to 5.2 years after endoscopic treatment.



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**Pathogenic Profile of Catheter-Associated Urinary Tract Infections in a Pediatric Institution**

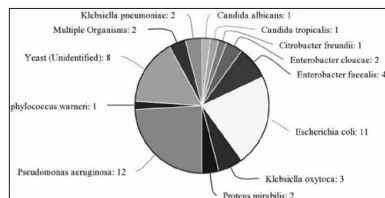
Daniel Marchalik<sup>1</sup>, Henry Collier Wright, IV<sup>1</sup>, Lee A. Richter<sup>2</sup>, Amanda Pysher<sup>1</sup>, Clayton P. Smith<sup>3</sup>, Evan M. Michaelson<sup>3</sup>, Keith Kowalczyk<sup>1</sup>, Gaurav Bandi<sup>1</sup>, Jonathan Hwang<sup>1</sup>, Kevin McGeagh<sup>1</sup>  
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**Introduction:** Although the prevalence and morbidity of pediatric CAUTI is extensive, they remain poorly studied. To date, few studies have explored the causative agents of pediatric CAUTI, and none have demonstrated the implications of concomitant non-urinary infections on CAUTI pathogenesis.

**Materials & Methods:** From 2010 to 2014, all CAUTI (as defined by CDC criteria) occurring in a single pediatric institution were recorded in a prospectively maintained database. A retrospective chart review was subsequently conducted on the identified CAUTI events, characterizing the infections by causative agents and concurrent infection status.

**Results:** Fifty pediatric patients with CAUTI were identified. Thirteen different pathogens were responsible for the CAUTI, with the majority of infections caused by Pseudomonas aeruginosa (12), Escherichia coli (11), and yeast (8). Figure 1. Fourteen of 50 (28%) CAUTI demonstrated resistances of 3 or more antibiotics. Concurrent non-genitourinary infection occurred in 25 (50%) of patients, almost all (88%) respiratory in origin. A pathogenic overlap (same agent causing CAUTI and non-genitourinary infection) occurred in 6 of 25 (24%) patients: 2 yeast, 2 Klebsiella pneumoniae, 2 Pseudomonas aeruginosa (all respiratory). Forty-two (84%) CAUTI occurred in the ICU setting.

**Conclusions:** Concurrent infection occurred in 50% of CAUTI patients; one fourth of patients with concurrent infections had the same pathogen result in a CAUTI. These findings should raise awareness of the potential risk factor that concurrent infection poses on pediatric CAUTI.



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**Comparison of Referral Patterns for Cryptorchidism between an Urban and Rural Tertiary Center**

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**Introduction:** Current guidelines in the management of cryptorchidism recommend performing orchidopexy before 12 months. We compare the age of pediatric patients undergoing surgical intervention for cryptorchidism at an urban and rural tertiary center.

**Materials & Methods:** A retrospective review of patients undergoing surgical evaluation for cryptorchidism was performed. Patients treated for reasons unrelated to cryptorchidism or referred for multiple urologic diagnoses were excluded. The patients at each institution were then divided into 6 groups based on their age at time of surgery.

**Results:** A total of 131 cases at the urban center and 100 cases at the rural center were identified. At the rural center, the average age of referral and surgery were 48.3 and 53.8 months, respectively, compared to 59.5 and 65.2 months at the urban center. The statistical difference in age distribution between the patient populations was significant (p value > 0.001). This difference was due to a larger portion of rural site patients being treated at less than 12 months, and a greater proportion urban site patients being treated between 48-132 months. Only 9.9 percent of patients at the urban site and 23 percent at the rural institution underwent intervention at less than one year of age.

**Conclusions:** A pattern of delayed referral and intervention was observed at both institutions despite differing geographic regions and heterogeneous patient populations.

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**Incontinent Urinary Diversion in Young Adult Spina Bifida Patients**  
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**Introduction:** Managing the urinary tract of young adults with spina bifida (SB) who can no longer manage with clean intermittent catheterization (CIC) presents a unique challenge for urologists. We present our experience with this population from our SB clinic, in which we care for patients from birth to 35 years.

**Materials & Methods:** With IRB approval, we completed a retrospective chart review of SB patients who underwent incontinent urinary diversion in the last 3 years. We collected demographics, preoperative testing, operative characteristics and postoperative events.

**Results:** We identified six patients who underwent incontinent urinary diversion. Table 1 highlights important patient characteristics, indication for procedure, and complications. The median age at time of surgery was 28.3 years. 5 (83%) patients had significant comorbidities, including hypertension, CKD, severe restrictive lung disease, and sleep apnea. Prior to surgery, all patients had an ultrasound and urodynamics and were evaluated by the complex care service. Median operative time was 313 minutes (range 213-594). The median length of stay was 25 days. 5 (83%) required ICU postoperatively and 4 (67%) had major postoperative complications. At a median of 41.4 months (range 4-67), all patients are dry and renal function is stable or improved.

**Conclusions:** Incontinent urinary diversion should be considered in young adult SB patients. These patients are complex with high risk of postoperative complications. Clear expectations and goals should be established preoperatively.

| Patient # | Age (yrs) | Gender | Comorbidities  | Quadrant           | Indication for surgery   | Type of procedure                      | Complication | LOS (days) |
|-----------|-----------|--------|--|--------------------|--|--|--------------|------------|
| 1         | 28        | M      | Spina Bifida, chronic kidney disease stage 3, scoliosis, nocturnal enuresis, obstructive sleep apnea               | Unice              | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 30         |
| 2         | 33        | M      | Spina Bifida, chronic kidney disease, hypertension, chronic obstructive pulmonary disease, obstructive sleep apnea | Open               | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 37         |
| 3         | 31        | F      | Spina Bifida, chronic kidney disease, obstructive sleep apnea  | Open               | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 29         |
| 4         | 21        | M      | Spina Bifida, chronic kidney disease, obstructive sleep apnea  | Minimally Invasive | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 23         |
| 5         | 24        | M      | Spina Bifida, chronic kidney disease, obstructive sleep apnea  | Open               | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 26         |
| 6         | 31        | F      | Spina Bifida, chronic kidney disease, obstructive sleep apnea  | Open               | Involving ureter, bladder, prostate, vas deferens, and vasectomy | Significant retroperitoneal dissection | None         | 11         |

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**Surveillance, epidemiology, and End Results (SEER) Analysis of Urothelial Cell Carcinoma in Children Aged ≤ 18 Years in the United States**

Deborah Kaye<sup>1</sup>, Ravleen Khalsa<sup>2</sup>, Jen-Jane Liu<sup>1</sup>, Shenghan Lai<sup>3</sup>, Trinity Bivalacqua<sup>1</sup>  
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**Introduction:** To estimate overall and disease specific survival amongst patients with bladder cancer ≤ 18 years old using Surveillance, Epidemiology, and End Results (SEER) registry data and to explore factors associated with survival.

**Materials & Methods:** Using SEER data, all persons aged ≤ 18 years diagnosed with histologically confirmed primary urothelial bladder cancer between 1973 and 2010 were identified. Kaplan-Meier primary method was used to estimate survivor functions, and the log-rank test was used to test the equality of survivor functions. Factors associated with survival were identified using Cox's proportional hazards model.

**Results:** A total of 215 patients ≤ 18 years old were diagnosed with bladder cancer, of which 97 had transitional cell carcinoma. Mean age at diagnosis was 16 years. Seventy-four percent of patients were male. Nearly 50% of tumors were well-differentiated. Type of definitive therapy varied. Four patients (4.1%) died, one from bladder cancer. Overall survival in patients with poorly differentiated grade or cell type not determined were significantly worse than in those with well differentiated or moderately differentiated tumors. There were no statistically significant differences in overall survival between age group, gender, racial group, stage and year of diagnosis

**Conclusions:** In a population based cohort, urothelial bladder cancer in patients < = 18 years of age is rare. If diagnosed with urothelial carcinoma, stage and grade is often low and thus the prognosis is excellent. However, if diagnosed with advanced disease then the overall prognosis is poor and reflects the aggressive nature of this cancer.

26

**Urine: Using High Dose Anticholinergics for Refractory Patients in Combination with Desmopressin for Nocturnal Enuresis**

Pamela I. Ellsworth, Jackie Pires, Aaron Berkenwald  
UMass Memorial Medical Center/University of Massachusetts Medical School, Worcester, MA

**Introduction:** Desmopressin (DDAVP) is the most common pharmacologic therapy for nocturnal enuresis. Combination therapy, DDAVP plus fixed dose anticholinergic therapy improves symptoms in some patients who fail DDAVP monotherapy. We evaluated treatment response of high dose (advanced) anticholinergic plus DDAVP in prior DDAVP monotherapy failures.

**Materials & Methods:** An IRB approved retrospective review was performed of children treated from November 2013 through December 2014 with DDAVP monotherapy and combination therapy (DDAVP plus anticholinergic) with at least one visit after treatment initiation/change and who satisfied study inclusion/exclusion criteria. Factors evaluated included age, sex, BMI, history of alarm failure, ADD/ADHD, family history nocturnal enuresis, constipation, dysfunctional voiding, overactive bladder, treatment with psychotropics, postvoid residual.

**Results:** Of the 63 patients, 36 (57%) responded to monotherapy DDAVP. 25/27 nonresponders received combination therapy, 68% responding to low dose combination therapy DDAVP + Oxybutynin 5 mg. Of the 8 low dose combination therapy nonresponders, 6 (75%) responded to combination therapy of DDAVP + Oxybutynin (7.5-10 mg).

**Conclusions:** Titrating the dose of oxybutynin (5-10 mg) in DDAVP monotherapy nonresponders allowed for 92% to become dry at night. Failure of prior alarm therapy was more common in all nonresponders, whereas coexistent ADHD, dysfunctional voiding and OAB were more common in monotherapy nonresponders. Males were more likely to require high-dose combination therapy than females.

| Therapy (number treated)                        | Age (years) (ave) | Sex M/F     | BMI (ave) | Alarm | ADD/ADHD | Fam Hx | Constipation | Dysfunctional voiding | OAB   |
|---|-------------------|-------------|-----------|-------|----------|--------|--------------|-----------------------|-------|
| Monotherapy responder (36)                      | 11.9              | 61.1%/38.9% | 22.3      | 11.1% | 16.7%    | 30.6%  | 36.1%        | 19.4%                 | 0%    |
| Monotherapy nonresponders (27)                  | 11.2              | 63%/37%     | 21.3      | 25.9% | 40.7%    | 18.5%  | 33.3%        | 48.2%                 | 29.6% |
| Low dose combination therapy responders (17)    | 11.2              | 47.1%/52.9% | 21.1      | 0%    | 41.2%    | 23.5%  | 35.3%        | 47.1%                 | 23.5% |
| Low dose combination therapy nonresponders (8)  | 11.3              | 87.5%/12.5% | 21.9      | 75%   | 37.5%    | 12.5%  | 25%          | 50%                   | 37.5% |
| High dose combination therapy responders (6)    | 10.8              | 83.3%/16.7% | 21.2      | 66.7% | 50%      | 0%     | 33.3%        | 50%                   | 33.3% |
| High dose combination therapy nonresponders (2) | 12.5              | 100%        | 24.2      | 100%  | 0%       | 50%    | 0%           | 50%                   | 50%   |

27

**How to Avoid Scrotoplasty in Boys with a Concealed Webbed Penis - A Preliminary Report on the Paraphimotic Band Technique**

Mark R. Zaontz  
Virtua Health System, Voorhees, NJ

**Introduction:** There are a myriad of techniques to correct the concealed penis. Those patients with significant penoscrotal webs, invariably have need for a scrotoplasty as part of their corrective surgery. In an attempt to obviate scrotoplasty, the author has modified the surgical approach to these patients and herein reports on the preliminary results.

**Materials & Methods:** From July 2014 through March 2015, 20 boys ages 6 months to 6 years (mean 10 months), underwent correction of penile concealment with the presence of significant scrotal webbing using a paraphimotic band incision dorsally and ventrally to avoid scrotoplasty. By retracting the foreskin proximally, paraphimosis was created and, by incising each band at 12 and 6 o'clock, the scrotal web appeared to drop back to a more normal anatomic configuration. The remaining shaft was degloved and locking sutures were placed at 12, 5 and 7 o'clock at the base of the penis in buck's fascia and affixed to the corresponding dermis of the abdominal wall/shaft skin junction using 4-0 PDS suture. The shaft skin is then unfurled and the excess skin excised with the circumcision defect approximated with fine chromic catgut.

**Results:** Follow up ranged from 3 weeks to 6 months (mean 3 months). All patients had excellent penile shaft exposure and no significant webbing noted.

**Conclusions:** The paraphimotic band modification for reconstruction of the concealed penis appears to be successful and reproducible in the short term. Further follow up is necessary to confirm that this procedure stands the test of time.

# Scientific Poster Session I - Infertility/Erectile Dysfunction & Other

| P1  | P3   |
|---|--|
| <p><b>Development of Robotic Partial Kidney Transplant in a Porcine Model: A Pilot Study</b><br/>                     Mark Ball, Nathaniel Readal, Michael Gorin, Phillip Pierorazio, Mohamad Allaf<br/> <i>Johns Hopkins University School of Medicine, Baltimore, MD</i></p> <p><b>Introduction:</b> Currently, there is a discrepancy in the number of kidney transplant donors and recipients. While the kidney has discrete segmental vasculature that can be divided as in partial nephrectomy, partial kidney transplant is not a currently used modality. We sought to develop a partial kidney transplant porcine model.</p> <p><b>Materials &amp; Methods:</b> Adult 200 lb swine were selected because of similar renal vasculature to humans. Using a robotic approach, the segmental renal vessels to the upper and lower pole were dissected. After systemic heparin was administered, the upper pole vessels were selectively clamped and an upper pole heminephrectomy was performed. The lower pole was reconstructed and the upper pole was autotransplanted to the pelvis after flushing with heparinized saline intracorporally. The internal iliac vessels were used as donor vessels. Both artery and vein anastomoses were performed in an end-to-end fashion. A calicovesicostomy was performed for the urinary anastomosis. The end point of this pilot study was vascular perfusion of the donor moiety.</p> <p><b>Results:</b> A total of 10 non-survival surgeries were performed. Systemic heparinization was not utilized in the first two cases and the donor kidney clotted before the anastomoses were completed. In the final 8 cases with adequate anticoagulation, the donor moiety reperused after the vascular anastomoses were completed. Mean operative was 4:15 hours and mean vasculature anastomosis time was 40 minutes.</p> <p><b>Conclusions:</b> In this pilot study, partial kidney transplant appears to be technically feasible in a porcine model. Future work will investigate post-operative recovery of renal function.</p> | <p><b>Treatment of Hypogonadal Men with Clomiphene Citrate Does not Significantly Increase the Risk of Polycythemia: A Multi-institutional Study</b><br/>                     Karen Wheeler<sup>1</sup>, Raj Kumar<sup>2</sup>, Raymond A. Costabile<sup>1</sup>, Parviz K. Kavoussi<sup>3</sup>, Ryan P. Smith<sup>1</sup><br/> <sup>1</sup>University of Virginia, Charlottesville, VA; <sup>2</sup>University of Central Florida, Orlando, FL; <sup>3</sup>Austin Fertility and Reproductive Medicine, Austin, TX</p> <p><b>Introduction:</b> It is well established that exogenous testosterone replacement therapy (TRT) may be detrimental to a man's fertility. However, clomiphene citrate (CC) is commonly used, off-label, to treat hypogonadal men in a fertility preserving manner. Polycythemia is a concerning side effect of direct TRT but there is no data regarding CC and polycythemia risk.</p> <p><b>Materials &amp; Methods:</b> The incidence of polycythemia was retrospectively assessed in men diagnosed with hypogonadism and treated with CC at the University of Virginia and Austin Fertility &amp; Reproductive Medicine between 3/2011 - 1/2015. The primary and secondary outcomes were development of polycythemia (defined as a hematocrit &gt; 52%) after CC treatment and absolute changes in testosterone (T) and hematocrit (Hct), respectively.</p> <p><b>Results:</b> A total of 157 men were included, with a median age of 37 years (range 20-84 years; IQR 12.75 years), and mean duration of CC treatment of 6.6 months. There were three cases of polycythemia (mean Hct 52.9%, mean T 775.7 ng/dL), with an incidence of 1.9%. Following initiation of CC, the mean increase in T was 371.7 ng/dL (95% CI: 339.3 ng/dL, 404.1 ng/dL), and the mean increase in Hct was 0.57% (95% CI: 0.17%, 0.97%).</p> <p><b>Conclusions:</b> The incidence of polycythemia in this population of men treated with CC is markedly lower than reported rates for TRT treated men and is not associated with supra-therapeutic testosterone levels. The improvement in absolute T levels was similar to TRT treated men. There is not a significant risk of polycythemia in men treated with CC for hypogonadism.</p> |
| P2  | P4   |
| <p><b>What's in a Name? The History and Origins of Popular Urologic Eponyms</b><br/>                     Shiv B. Patel, Drew A. Palmer, Kari Bailey, Alireza Moinzadeh, Andrea Sorcini, David Canes<br/> <i>Lahey Hospital and Medical Center, Burlington, MA</i></p> <p><b>Introduction:</b> The lexicon of medicine is filled with eponyms. From anatomical landmarks such as Alcock's canal to ubiquitous surgical instruments like the Ellik evacuator, eponyms have come to be an inescapable component of the language of urology. We aim to expand upon the origins of many of these eponyms to enhance understanding of this vocabulary as it pertains to urologic practice.</p> <p><b>Materials &amp; Methods:</b> A literature review was performed regarding devices, pathologies, and anatomical landmarks encountered in urologic practice using the PUBMED and JSTOR databases.</p> <p><b>Results:</b> Eponyms are encountered daily in modern urology and are a vital part of communication between health care professionals. In the operating room, an Ellik evacuator may be utilized, which was designed by Milo Ellik in 1937 while still a resident at the University of Iowa. An essential tool in a urologist's armamentarium, the Foley catheter carries the name of Frederic Eugene Basil Foley who initially presented the concept of a self-retaining catheter in 1935, only to fail to secure a patent on the device in 1937 as it was already obtained by the Davol Rubber Company one year prior. Similar fascinating histories are associated with other eponymous terms such as the Deaver retractor, Bacille Calmette-Guerin, Lahey forceps and many more.</p> <p><b>Conclusions:</b> Though eponyms have given way to utilitarian terms in much of modern medicine, they will continue to be an integral component of communication between physicians. Unless their individual stories are retold, we risk losing the essential historical origins.</p>  | <p><b>Urothelial Amyloidosis at a Tertiary Referral Center</b><br/>                     Samuel J. Miller<sup>1</sup>, Nannan Thirumavalavan<sup>2</sup>, Mark H. Katz<sup>2</sup><br/> <sup>1</sup>Boston University School of Medicine, Boston, MA; <sup>2</sup>Boston Medical Center, Boston, MA</p> <p><b>Introduction:</b> Urothelial amyloidosis is a disease of proteinaceous deposits in the urinary tract, which can present with localized or systemic disease. Bladder disease typically presents with hematuria or irritative voiding symptoms. Our goal was to characterize the demographics and disease characteristics of patients diagnosed with urothelial amyloidosis at a major amyloid center.</p> <p><b>Materials &amp; Methods:</b> We performed an IRB-approved, retrospective chart review of 34 patients with urothelial amyloidosis. Patient data was evaluated for age, presenting symptoms, ethnicity, disease location, localized versus systemic disease, and treatments.</p> <p><b>Results:</b> Our cohort included 34 patients [21 males (61.7%) and 13 females (38.2%)], with an average age of 62.7 years (range 42-84 years). 26 patients were Caucasian (76.4%), 2 were African-American (5.8%), 3 were Asian (8.8%), and 3 had no ethnicity documented. 26 patients had amyloid deposits only in the bladder (76.4%), 6 only in the ureter (17.6%), and 2 had both bladder and ureteral involvement (5.8%). 11 patients had systemic disease (32.3%) while 23 had only urothelial involvement (76.4%). 18 patients underwent transurethral resection/fulguration (TUR) (52.9%), while 2 underwent radiation (5.8%) and 3 had DMSO (8.8%). Importantly, 27 patients (79.4%) presented initially with urinary symptoms, leading to the diagnosis of amyloidosis.</p> <p><b>Conclusions:</b> Though hematuria and urinary symptoms are common presentations to urologists, they may be the initial symptoms of either localized or systemic amyloidosis. Patients diagnosed with urothelial amyloidosis should be further worked up for systemic disease. In addition, patients diagnosed with amyloid presenting with hematuria or urinary symptoms should be evaluated by a urologist.</p>                        |



## P5

**Does Pharmacological Thromboembolic Prophylaxis Use Adversely Affect Perioperative Outcomes in Patients Undergoing Partial Nephrectomy?**  
Abdo Kabarriti, Ibarido Zambrano, Blase Prospero, Sai Mandalapu, Thomas J. Guzzo  
*Hospital University of Pennsylvania, Philadelphia, PA*

**Introduction:** Thromboembolic events are a significant cause of morbidity and mortality after major urological procedures. However, pharmacological thromboembolic prophylaxis (PTP) is often withheld in procedures with a risk of postoperative bleeding such as partial nephrectomy (PN). The goal of this study is to evaluate the safety of administration of PTP at the time of induction of anesthesia immediately prior to PN.

**Materials & Methods:** We performed a retrospective cohort review of all the patients who underwent a PN by a single surgeon between August 2009 and August 2013. We stratified our patients by whether or not they received 5000 units of unfractionated heparin (UFH) PTP at the time of induction of anesthesia immediately prior to their PN and compared differences in estimated blood loss (EBL), transfusion rate (TR), complication rate (CR) and length of hospitalization stay (LOS).

**Results:** A total of 152 PN were included (61 open, 91 robotic), 129 (85%) of which received PTP UFH. For the entire cohort, the mean tumor size was 2.7 cm (range 1-20), LOS was 3.5 days (range 1-15), EBL was 257 mL (range 25-1200), and 15 (9.8%) patients required a perioperative blood transfusion while 11 (7%) patients experienced a perioperative complication. Administration of PTP UFH was not associated with a longer LOS ( $p = 0.978$ ), difference in EBL ( $p = 0.855$ ), perioperative TR ( $p = 0.538$ ) or complication rate ( $p = 0.146$ ).

**Conclusions:** At our institution, the use of PTP did not lead to significant increased risk in EBL, LOS, TR or CR. Surgeons should consider preoperative PTP in patients at high risk for thromboembolic events who are undergoing PN.

## P7

**Effects of Prostate Size on Efficacy of Laser Enucleation of the Prostate: Measuring Urodynamic and Symptomatic Outcomes.**  
Amit V. Mishra, Amar Raval, Michael Amirian, Ankhil Das  
*Thomas Jefferson University, Philadelphia, PA*

**Introduction:** Benign prostatic hypertrophy (BPH) is a significant contributor of obstructive voiding symptoms in men. Holmium laser enucleation of the prostate (HoLEP) is an effective management option for patients who have failed medical treatment. The purpose of this study is to determine the relationship between prostate volume and postoperative outcomes including postvoid residual, peak voiding flow, and AUA symptoms score of the HoLEP procedure.

**Materials & Methods:** A retrospective chart review was performed on 72 patients who have undergone the HoLEP procedure from January 2012 to February 2015. Prostate size was measured by transrectal ultrasound. The data was divided into two groups at the median prostate size. Preoperative and postoperative post-void residual volume (PVR), peak voiding flow (PF), and AUA symptom score (AUASS) were measured and compared in each group using paired Student's t-tests.

**Results:** The median prostate size was 79 g (range: 17-237 g). In the smaller prostate group, PVR was significantly decreased by a mean of 199 mL ( $p < 0.001$ ), peak flow was significantly increased by a mean of 11 mL/s ( $p < 0.05$ ) and AUASS was significantly decreased by a mean of 12 ( $p < 0.001$ ). In the larger prostate group PVR was significantly decreased by a mean of 113 mL ( $p < 0.05$ ), and peak flow was significantly increased by a mean of 8 mL/s ( $p < 0.005$ ). There is no significant difference between both groups.

**Conclusions:** HoLEP is a very effective method of treating BPH in terms of improving symptoms and postoperative outcomes regardless of prostate size.

## P6

**Peyronie's Disease and Injectable Collagenase Clostridium Histolyticum: Improvements in Penile Curvature and Subjective Symptoms**  
Kevin K. Yang, Nelson E. Bennett, Jr.  
*Lahey Hospital and Medical Center, Burlington, MA*

**Introduction:** Few definitive and durable interventions exist for Peyronie's disease (PD) other than surgical repair. We reported the use of injectable Collagenase Clostridium histolyticum (CCh), a collagenolytic agent towards collagen for patients with PD.

**Materials & Methods:** From May 2014-March 2015, we prospectively followed PD patients with  $> 30$  degrees of penile curvature who received CCh from a single provider at a single institution. Patients' PD symptoms across three domains: psychological and physical symptoms (scored 0-24), penile pain (0-30) and bother (0-18) were evaluated by the validated Peyronie's Disease Questionnaire (PDQ). Objective measurements of penile curvature and deformity were also assessed.

**Results:** We identified 31 unique PD patient treated with CCh. 20 had data available for analysis with 11 in active treatment. Mean follow up was 168 days with an average of 4.8 injections performed per patient. Surveillance concluded for 3 patients, who completed treatment after achieving success following 2 injections. Mean pre-treatment penile curvature was 41 degrees. There was a significant curvature reduction of 15.5 degrees ( $p < 0.01$ ) after therapy. There was an interval improvement in the psychological and physical symptoms (mean decrease 0.74,  $p < 0.01$ ) and bother score (mean decrease 0.65,  $p < 0.01$ ), but no significant improvement in penile pain ( $p = 0.45$ ). One instance of a penile hematoma managed conservatively.

**Conclusions:** In this prospective series, CCh injection is clinically effective and safe in patients with PD resulting in improvements of penile curvature, subjective bother, and psychological and physical symptoms.

## P8

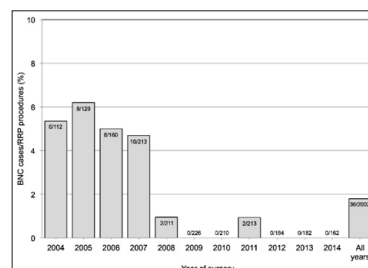
**Bladder Neck Contracture after Robotic Prostatectomy: Incidence, Prevention, and Treatment**  
Joseph Wagner, Max Jackson, Ilene Staff, Peter Haddock  
*Hartford Hospital, Hartford, CT*

**Introduction:** Bladder neck contracture (BNC) is a well-known complication after radical prostatectomy (RP). We examined the incidence of BNC with increasing surgeon experience, and the treatment and outcomes of this complication.

**Materials & Methods:** Patients undergoing robotic prostatectomy by a single surgeon between January 1, 2004 and December 31, 2014 were identified. From this cohort, patients who developed BNC were selected. Patients completed a self-administered EPIC 26 quality of life questionnaire pre-operatively and at each follow up visit. Continence was defined as no pads or 1 pad with occasional dribbling. The incidence, treatment, and outcomes for these patients was examined.

**Results:** 36/2,002 (1.8%) patients developed a BNC at a median of 182 days. With experience, the rate of BNC decreased, Figure 1. 22 patients underwent a single dilation and/or transurethral incision while 14 patients required more than one procedure with a continence rate of 83% (30/36). Of the 6 incontinent patients, 1 declined further treatment and 2 had sphincters placed. 3 patients (8.3%) had recalcitrant BNCs; 1 underwent open urethroplasty while 2 with concurrent bladder non-compliance underwent a robotic catheterizable bladder augment.

**Conclusions:** In a large, single surgeon series, post-RP BNC incidence decreased with surgical experience. The majority of patients responded well to dilation and/or incision with a continence rate of 83%, while a minority required more extensive surgery with a continence rate of 100%.



# Scientific Poster Session I - Infertility/Erectile Dysfunction & Other

P9

## Call Schedule and Sleep Patterns in Urology Residents Following the 2011 ACGME Reforms

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*The Johns Hopkins School of Medicine, Baltimore, MD*

**Introduction:** In response to the 2011 duty hour restrictions by the Accreditation Council for Graduate Medical Education, many residency programs adopted a night float system. In response to concerns regarding the effects of night float on sleep and subsequently on patient care, we examined sleep patterns of residents assigned to different call schedules.

**Materials & Methods:** Urology residents assigned to standard day shift (Monday-Friday, 6 am - 6 pm), night float (Sunday-Friday, 6 pm - 6 am) or 24-hour home call and attending physicians were monitored for two week periods using actigraphy bands. Total sleep time, light versus deep sleep time, sleep latency and number of disruptions during sleep were measured. Comparative statistics and logistic regression were used to compare call systems and to determine predictors of sleep metrics.

**Results:** When comparing day shift, night float, and 24-hour home call, the only significant difference was in sleep latency. Upon comparing residents of various levels (junior, senior, and research year), all sleep variables except sleep latency were significantly different. Compared to residents, attending physicians had shorter sleep latency and were woken less frequently. Being a research year resident was the only significant univariate predictor of total sleep. Age and being a research year resident were significant univariate predictors of sleep latency.

**Conclusions:** These data suggest that night float shifts do not lead to a significant change in total sleep or quality of sleep. Further research is needed to confirm these findings and to determine the impact of night float rotations on resident quality of life and on patient safety.

P11

## Factors Associated with Treatment Satisfaction Following Penile Prosthesis Implantation

Jacob L. Khurgin, Uzoma A. Anele, Arthur L. Burnett, II  
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**Introduction:** The potential association of patient characteristics and satisfaction rates after penile prosthesis implantation (PPI) has not been fully elucidated. We hypothesized that particular variables may correlate with satisfaction rates.

**Materials & Methods:** Ninety patients with a PPI who were evaluated in our clinic between January 2012 and December 2013 were contacted by telephone and/or email. Patients completed the Erectile Dysfunction Inventory of Treatment Satisfaction (EDITS), International Index of Erectile Function (IIEF), and Centers for Disease Control and Prevention (CDC) Health-Related Quality of Life (HRQOL) questionnaires. Patient characteristics were tabulated, including: demographics, age of onset and duration of erectile dysfunction, medical and urological comorbidities, and social history. Satisfaction with PPI was assessed using EDITS, IIEF Overall Satisfaction (OS) and Intercourse Satisfaction (IS) domain scores. Nonparametric (Spearman) correlation analysis was performed.

**Results:** Sixty-six of 90 patients (73%) completed the survey. IIEF-OS correlated with 3 of the 4 CDC-HRQOL question scores: question #1, which assesses the patient's perception of his general health ( $p = 0.02$ ,  $r = -0.29$ ); question #3, which assesses the perception of his mental health ( $p = 0.01$ ,  $r = -0.30$ ); and question #4, which assesses the impact of his health on usual activities ( $p = 0.03$ ,  $r = -0.27$ ). IIEF-OS also correlated with the presence of depression ( $p = 0.02$ ,  $r = -0.29$ ) and a diagnosis of hypogonadism ( $p = 0.04$ ,  $r = -0.25$ ). IIEF-IS scores correlated with the presence of depression ( $p = 0.02$ ,  $r = -0.28$ ).

**Conclusions:** Certain patient characteristics correlate with lower satisfaction after PPI. Patients may be counseled that the presence of depression, hypogonadism, and a lower health-related quality of life may impact their PPI satisfaction.

P10

## Management of Complex Anterior Prostate-Symphyseal Fistulas with Interposition Rectus Abdominus Muscle Flap

Daniel A. Kaufman, Brendan M. Browne, Leonard N. Zinman, Alex J. Vanni  
*Lahey Hospital and Medical Center, Burlington, MA*

**Introduction:** Anterior prostate-symphyseal fistulas are exceedingly rare and have life threatening complications including pubic osteomyelitis and intra-abdominal sepsis. To our knowledge, successful reconstruction of radiation induced prostate-symphyseal fistulas has not been well described. Our objective is to describe the management and outcomes of complex anterior prostate-symphyseal fistulas at our institution over a consecutive 10-year period.

**Materials & Methods:** We performed a retrospective review of patients undergoing surgical management for anterior prostate-symphyseal fistulas between January 1, 2006 and December 31, 2015. Patient demographics as well as preoperative, operative and postoperative data were reviewed, including etiology of fistula, surgical management, and outcomes.

**Results:** A total of 5 patients with anterior prostate-symphyseal fistulas underwent surgical repair. Previous pelvic radiation was identified as the etiology in 4 patients, while pelvic fracture was the etiology of the remaining 1 patient. All 4 patients with radiation-induced fistulas had pubic osteomyelitis. Of the 5 patients, 4 underwent pubic symphysis debridement, fistula closure and repair with an interposition rectus abdominis muscle flap, while 1 patient required permanent urinary diversion with creation of an ileal loop. At a mean follow up of 34 months, 100% of the patients undergoing repair with interposition rectus flap were closed with 1 procedure.

**Conclusions:** Radiation or trauma induced prostate-symphyseal fistulas can be successfully reconstructed with pubic symphysis debridement and fistula closure with an adjunct rectus abdominis interposition flap, avoiding urinary diversion in the majority of patients.

P12

## Active Substance Abuse Concurrent with Surgery as a Newly-Identified Infection Risk Factor in IPP Placement Based on a Retrospective Analysis of Health and Socioeconomic Factors

Alejandra Balen, Martin S. Gross, Ricardo Munarriz  
*Boston University Medical Center, Boston, MA*

**Introduction:** In the past 10 years a single surgeon has implanted 590 IPPs at our institution. In that same period, we have noted an infection rate of approximately 2% of new IPPs. A retrospective analysis was performed to examine potential patient health and socioeconomic factors that influence our IPP infection rate. Our investigation revealed that patients engaging in substance abuse at the time of implantation are more likely to have infection after IPP placement.

**Materials & Methods:** This is a retrospective single-institution IRB-exempt study of 590 patients who underwent IPP placement. Relevant elements of patients' operative notes and charts were extensively reviewed to compile study data. Rigorous statistical analysis was performed.

**Results:** Between 2002 and 2014, 590 patients underwent IPP placement. Age, operative data, and rates of hypertension, hyperlipidemia, diabetes, HIV status, and MRSA infection were established. Also documented were HbA1c, preoperative blood glucose, CD4 count, active and historical substance abuse, former and current smoking, insurance status, employment status, homelessness, and ethnicity. Post-operative infection occurred in 12 patients. Of these, 5 (42%) were engaged in substance abuse at the time of infection. The rate of documented concurrent substance abuse in the 590 total implants was approximately 7.2%. No other patient socioeconomic or health factors approached statistical significance.

**Conclusions:** Active substance abuse at the time of implantation appears to be a newly-identified risk factor for IPP infection in our population of IPP patients over the past 10 years. Other health and socioeconomic factors were not relevant to IPP infection risk.

P13

28

**Do Male Patients Have a Gender Preference for the Clinician Diagnosing and Treating Their Sexual Dysfunction?**

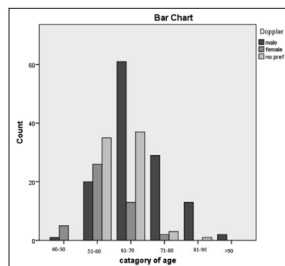
Michael W. Bickell<sup>1</sup>, Michael Frank<sup>2</sup>, Brian L. Steixner<sup>3</sup>  
<sup>1</sup>Albert Einstein Medical Center, Philadelphia, PA; <sup>2</sup>Richard Stockton College of New Jersey, Galloway, NJ; <sup>3</sup>Urology Jersey Group, Somers Point, NJ

**Introduction:** With an increasing awareness of male sexual dysfunction and number of Men's Health Centers nationally, the patient experience is of critical importance in the care of erectile dysfunction (ED). Our hypothesis is men have a male gender preference for the clinician treating their ED and older men will have a stronger preference for male practitioners when compared to younger men.

**Materials & Methods:** 248 men seeking treatment for oral therapy refractory ED with a single urologist were provided with a questionnaire addressing preferences for the gender of the clinician performing their penile doppler, intracavernosal injection teaching, and follow up visits.

**Results:** Of 248 men surveyed, 126 (50.8%), 146 (58.9%), 123 (49.6%) preferred male practitioners to perform doppler imaging, injection teaching and in follow up care, respectively. However, this finding is mediated by the patient's age. When age was factored into the association, patients older than 60 showed a statistically significant preference for male practitioners and patients 60 and younger indicated no preference for male or female practitioner to perform doppler, injection teaching and follow up care (Pearson Chi Square = 71.4 (10) p < .001, 37.84 (10) p < .001, and 57.54, p < .001)

**Conclusions:** There is a clear association that men older than 60 prefer male clinicians in the treatment of ED. It is important to recognize the treatment preferences of these men and to identify their changing perspectives as they age.



P14

**Relation between Dietary Iron Intake and Testicular Function in Young Men**

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<sup>1</sup>University of São Paulo Medical School, São Paulo, Brazil; <sup>2</sup>Massachusetts General Hospital, Boston, MA; <sup>3</sup>Harvard School of Public Health, Boston, MA; <sup>4</sup>University of Copenhagen, Copenhagen, Denmark

**Introduction:** Iron is essential to life but too much can be toxic. With few exceptions, iron comes exclusively from the diet. Genetic iron overload is associated with profound hypogonadotropic hypogonadism, but little data are available on the associations of dietary iron intake with reproductive hormones and semen parameters in healthy men.

**Materials & Methods:** 189 healthy, 18-22 year old young men completed a validated 131-item food frequency questionnaire and provided blood and semen samples. Multivariable linear models adjusted for age, race, smoking status, BMI, abstinence time, and calorie, caffeine, alcohol and total fat intake.

**Results:** Dietary iron intake was positively associated with follicle stimulating hormone (FSH) (p = 0.003) and inversely with inhibin B levels (p = 0.025). Men in the highest quartile of iron intake (> 24.3 mg/day) had 48% (95% CI 22-70%) higher FSH levels and 21% (95% CI 8-33%) lower inhibin B levels compared to those in the lowest intake quartile (< 17.5 mg/day). No significant association was seen between iron intake and any semen parameter.

**Conclusions:** This study is the first to examine associations between dietary iron intake and markers of testicular function in healthy young men. Our data suggest that iron may negatively impact Sertoli cell function, as reflected by elevated FSH and decreased inhibin B levels, without affecting semen parameters. These data suggest that a moderate increase in iron may act at the level of the testis, as opposed to the pituitary impacts that are seen with severe iron overload.

**Prostate Cancer Screening Among Primary Care Providers: A Shift in Practice Patterns since 2012**

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<sup>1</sup>University of Massachusetts, Worcester, MA; <sup>2</sup>Warren Alpert Medical School, Brown University, Providence, RI

**Introduction:** Provider utilization of PSA as a screening tool for prostate cancer has changed since the United States Preventive Services Task Force (USPSTF) statement in 2012. This survey of PCP's associated with two health care systems will help to define the impact of the USPSTF statement on PCP delivery of care and identify areas of educational opportunity.

**Materials & Methods:** A survey composed of 25 questions was mailed electronically to PCP's within two academic health care systems. Providers included both hospital-employed and hospital-affiliated PCPs. The responses could not be traced to the respondent.

**Results:** Eighty-six PCP's responded to the survey, including 48% female providers and 52% male providers. The majority of respondents were MD/DO providers. Regarding familiarity with the 2012 USPSTF statement, 97% were somewhat or very familiar with the statement, and 75% had changed their practice patterns. Table 1 lists the responses of the survey participants to select questions.

**Conclusions:** This survey, while limited to two large academic centers, identifies changes in screening practices since the USPSTF 2012 statement. There is clearly a need for more educational opportunities for PCP's in regards to the USPSTF statement and the AUA guidelines.

| QUESTION  | RESPONSE   |
|---|--|
| Which of the following statements about the USPSTF statement on prostate cancer screening from May 2012 is true (Check ALL that apply)  | Advises against all routine PSA screening (n = 42)<br>Advises against the use of PSA testing for following patients with known prostate cancer (treated or untreated). (n = 0)<br>Recommends that providers engage men of the appropriate age in shared decision making about PSA screening, and that that they order a PSA test for men who request one after engaging in shared decision making. (n = 51)  |
| PSA mortality has decreased over the past two decades. To what extent do you believe that this can be explained by PSA screening?   | PSA screening is at least partially responsible for this decrease (37%)<br>PSA screening likely played no role in this decrease (31%)<br>Not sure (32%)  |
| Is the following statement true? "The USPSTF statement specifically recommends against digital rectal exam (DRE) in asymptomatic men for prostate cancer screening."  | Yes (41%)<br>No (40%)<br>Not sure (19%)  |
| The USPSTF statement claims that based on existing evidence, the routine use of screening PSA may impart more harm than benefit to the patient. To what extent do you agree or disagree with this claim?  | Strongly disagree (1%)<br>Disagree (15%)<br>No opinion (14%)<br>Agree (49%)<br>Strongly Agree (21%)  |
| How did your practice change? (Check all that apply) (*after the 2012 USPSTF Statement)   | I went from routinely recommending PSA screening to recommending against PSA screening (n = 7)<br>I went from a neutral stance on PSA screening (neither for or against) to recommending against PSA screening (n = 9)<br>I went from routinely recommending PSA screening to engaging patients in a shared decision making process and allowing patients to decide (n = 38)<br>I went from routinely discussing PSA testing with my patients to discussing it ONLY if the patient brings it up (n = 8)<br>Other (n = 5) |
| How concerned are you that NOT routinely recommending PSA screening to patients of appropriate age could lead to future litigation regarding failure to diagnosis early prostate cancer   | (Responses on continuum from 1 to 5):<br>1. Not at all concerned (14%) ---<br>2. (27%) --- 3. (34%) --- 4. 16% ---<br>5. Very concerned (9%)   |
| How concerned are you that routinely recommending PSA screening to patients of appropriate age could lead to future litigation regarding OVERdiagnosis early prostate cancer?   | (Responses on continuum from 1 to 5):<br>1. Not at all concerned (36%) ---<br>2. (34%) --- 3. (22%) --- 4. (3%) ---<br>5. Very concerned (5%)  |
| Do you routinely recommend a periodic digital rectal exam (DRE) of the prostate to asymptomatic patients that you consider of the appropriate age for prostate cancer screening?  | Yes: 42.42%<br>No: 57.58%  |
| Has the USPSTF statement on prostate cancer screening in 2012 changed your practice of recommending DRE?  | Yes, I recommend DRE more often (3%)<br>Yes, I recommend DRE less often (35%)<br>No, I have not changed my practice (62%)  |
| Do you feel that there is a need for more education of primary care providers regarding PSA screening, including topics such the evidence for and against screening, benefits and harms of screening, approaches to shared decision making, and others. | Yes (83%)<br>No (7%)<br>Not sure (10%)   |

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**To Perc or to Scope: Is a Urologic Approach to Ureteroenteric Strictures Superior?**

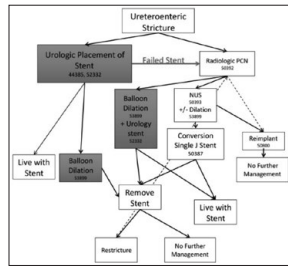
Nathan M. Shaw, Rebecca Zee, Jennifer Lobo, Tracey L. Krupski  
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**Introduction:** Ureteroenteric stricture occurs in up to 15% of patients after cystectomy with urinary diversion. First-line management is typically percutaneous nephrostomy (PCN) drainage. We sought to compare costs and timeline for treatment of a urologic approach with flexible endoscopy and retrograde ureteral stent placement.

**Materials & Methods:** Primary outcome measures were stricture management time and cost based on 2014 Medicare CPT reimbursement rates. We built a simulation model, Figure 1, using Arena Simulation Software simulating the experience of 1000 patients. The model describes three outcomes: urologic stent placement, PCN, and failed urologic management requiring PCN. The percentage of patients pursuing each treatment arm, average time to from stricture to clinical stability, and failure rate are modeled on a review of relevant literature and clinic experience

**Results:** Urologic retrograde stent placement efficacy was modeled at 50%. Patients who pursued initial urologic management incurred an average cost of \$699.13 and management time of 142 days. This includes patients who only required urologic treatment (\$269.39, 141 days) and those who failed and required PCN (\$1127.16, 143 days). Initial PCN alone cost \$931.00 and had the longest management time (152 days). Sensitivity analysis showed that a urologic success rate as low as 15% still favored initial urologic approach based on lower cost and management time.

**Conclusions:** Our model predicts a time and cost advantage to initial urologic management. Urologists should consider this strategy.



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**Trends in Diffusion of Surgical Innovation and Outcomes: A Comparative Analysis of Radical Prostatectomy in Military and Civilian Institutions**

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**Introduction:** Private civilian institutions exist in a financial environment that engenders competition for patients to increase profits, and, in theory, competition can promote clinical innovations. We sought to determine whether reimbursement structure altered the adoption of minimally invasive radical prostatectomy (RP), and if differential adoption was associated with a difference in clinical outcomes.

**Materials & Methods:** A retrospective cohort review from the Tricare administrative data looked at men with prostate cancer (ICD-9: 185) who received a RP (ICD-9: 60.5) between 2005 and 2010, excluding men who underwent salvage RP, for a final cohort of 5,082 men. Surgery occurred at civilian hospitals, where revenue is a fee-for-service reimbursement system, or military hospitals, which are supported through federal government appropriations. With description statistics and regression analysis, we assessed yearly utilization of minimally invasive RP, 30-day postoperative complications, preoperative and long term outcomes.

**Results:** A total of 3,366 men underwent RP in military hospitals compared to 1,716 in civilian hospitals, with minimal clinicodemographic differences between the groups. Overall, adoption of minimally invasive RP in civilian hospitals was 30% greater. There were fewer blood transfusions (OR 0.44) and shorter length of stay (IRR 0.85) among civilian hospitals, while postoperative complications, urinary incontinence and erectile dysfunction were comparable.

**Conclusions:** A fee-for-service reimbursement structure of civilian hospitals was associated with a more rapid adoption of minimally invasive radical prostatectomy but no clinically significant improvement in outcomes. Further studies are needed to determine if changes in the United States healthcare system will impact future development and dissemination of clinical innovation.

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**Prostate MRI-Fusion Biopsy Results in a Large Group Community Practice: 1-Year Results of 100 Patients**

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**Introduction:** It is unclear whether MRI-Fusion prostate biopsy (TBx) will be useful in general clinical practice due to radiologic / cost constraints. We sought to evaluate a large community group 1-year use of MRI-targeted fusion prostate biopsy (TBx).

**Materials & Methods:** We prospectively identified men with clinical parameters who met criteria for prostate mpMRI with IRB approval. Over a 12-month period, 520 mpMRI's were done, and 100 fusion-guided biopsies were performed using the UroNav platform. Radiographic confirmation and location of the MRI targets were centrally reviewed. Biopsies were done in ASC setting using a clinical pathway. Data was accrued, including patient age, PSA, PSAD, prostate size, MRI lesion size and location.

**Results:** Mean age/PSA/PSAD/prostate volume were 64 years/ 8.7 ng /0.25 /42 cc. A third of patients had 2 or more prior Bx, 30% had prior cancer diagnosis, and 76% had concurrent standard Bx for review. Primary targets were noted anterior or TZ in 42% of cases. Median MRI lesion size was 9 mm (3-36 mm). TBx was successful in identifying cancer in 67% of patients (LG-21/IG-27/HG-19). Standard Bx found cancer in 14/33 of men with negative TBx (5/14 Gleason 7+). Of 40 patients with concurrent TBx+ & prostatectomy, 30/40 had Gleason 7 cancer or higher.

**Conclusions:** Our community based practice has been successful in integrating MRI-Fusion prostate biopsy into daily clinical practice, and our results support its use as relevant prostate cancer was found in a majority of patients. We will continue to recommend concurrent standard biopsy for all patients at this time.

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**Acute Anaphylaxis Risk in Patients with Reported Contrast Allergies Undergoing Retrograde Urography: Fact or Fiction?**

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**Introduction:** Though widely performed, the safety of retrograde urography in patients with documented intravenous, iodinated contrast allergy ("contrast-allergy") is unclear. We performed a retrospective review of a single institution's experience with patients with contrast-allergy undergoing urography.

**Materials & Methods:** Patients undergoing retrograde urography at a single institution were identified between 2011-2014. Acute allergic reactions (AAR) were searched by ICD codes for "acute respiratory failure" (518.81, 518.84), "anaphylaxis" (995.0), and "drug reaction" (995.27). The date of the ICD-9 occurrence was compared to the index surgery date. Charts of those with contrast-allergy and these ICD-9 codes were manually reviewed to elucidate whether an AAR actually occurred within 24 hours of surgery.

**Results:** A total of 2,650 patients were evaluated, 1325 female (50%). Of these patients, 113 (4.2%) had contrast-allergy. Potential AAR related ICD-9 codes at any time were identified in 21 patients with contrast-allergy: 10 (0.3%) with respiratory failure (518.81, 518.84), 11 (0.04%) with anaphylaxis (995.0), and 0 with drug reactions (995.27). Only one patient (0.9%) with contrast-allergy was found to have an event within 24h postoperatively: AAR-related ICD-9 code of "acute respiratory failure," but found to be an unrelated myocardial infarction.

**Conclusions:** In this series of 113 patients with history of contrast allergy undergoing intraureteral contrast administration, none suffered perioperative drug reaction or anaphylaxis. These findings reflect conventional practice and moreover may help alleviate commonly voiced preoperative concerns.



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**Fournier's Gangrene: A Modern Analysis of Predictors of Outcomes**

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**Introduction:** This study identifies the predisposing factors related to Fournier's gangrene and validate the Fournier's gangrene severity Index score as a prognostic tool in the care of the Fournier's patient.

**Materials & Methods:** Medstar Washington Hospital Center records were searched from January 2003 to February 2015 for all patients with a diagnosis code of Fournier's gangrene, n = 40. Epidemiologic Data was collected for patients e.g., age, PMH, labs, etc, and used to calculate an FGSI score.

**Results:** The average age was 53.45 years and M/F ratio was 39:1. Patients presented with an average 2.675 predisposing factors; the most common was diabetes mellitus (n = 21) followed by hypertension (n = 18). The most common etiology was periscrotal (n = 25) next to perirectal (n = 9). Streptococcus was the most common source of infection (n = 14). Patients on average required three surgical interventions. The average and median hospitalization period was 19.625 and 11.5 days respectively. 11 patients developed sepsis. 24 (60%) patients experienced a complication. The overall mortality was 5% (n = 2). The average FGSI on admission was 5.368. Multivariate analysis showed FGSI score correlates with more surgical intervention, longer hospitalization, sepsis, complication and mortality.

**Conclusions:** The FGSI score predicts a greater likelihood of more surgical interventions, longer hospitalization period, sepsis, complications and mortality within this patient population. Diabetes mellitus continues to be the most common predisposing factors in FG patients. The mortality rate of 5% is much less than the historically reported 20-30% and may reflect improved understanding and care of this aggressive disease.

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**Long Term Successful Closure of Radiation and Surgically Induced Rectourethral Fistulas with Buccal Mucosa Graft and Muscle Interposition Flap**

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<sup>1</sup>Lahey Hospital and Medical Center, Department of Urology, Burlington, MA; <sup>2</sup>University of California, San Diego Medical Center, Department of Urology, San Diego, CA; <sup>3</sup>Lahey Hospital and Medical Center, Department of Colon and Rectal Surgery, Burlington, MA; <sup>4</sup>Lahey Hospital and Medical Center, Burlington, MA

**Introduction:** Rectourethral fistulas (RUF) resulting from pelvic radiation and surgery are a reconstructive challenge. Despite recent reports that most radiation induced RUF require urinary diversion, we believe that most fistulas can be successfully reconstructed regardless of etiology and size. We report our long term outcomes over a 17-year period with a standardized approach for complex RUF closure.

**Materials & Methods:** We performed a retrospective review of patients undergoing RUF repair between January 1, 1998 and February 28, 2015 at a single institution. Patient demographics as well as preoperative, operative and postoperative data were reviewed. All RUF were repaired using an anterior transperineal approach with an interposition muscle flap and selective use of a buccal mucosa onlay patch.

**Results:** A total of 102 patients with RUF underwent repair with an anterior perineal approach and gracilis muscle interposition flap (96 gracilis muscle interposition flaps, 6 other muscle interposition flaps). We compared 49 non-radiation induced and 53 radiation/ablated induced RUF. At a mean follow up of 18 months, 98% (48/49) of non-radiated RUF were closed with 1 procedure, while 85% (45/53) of radiated RUF were closed in a single stage.

**Conclusions:** Successful RUF closure is possible in 98% of surgical patients and 85% of radiated/ablated patients with 1 procedure. Most complex radiation induced RUF, regardless of size, can be successfully repaired with an anterior transperineal approach with buccal mucosa patch onlay and interposition muscle flap, avoiding permanent urinary and fecal diversion in the majority of patients.

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**High Utilization of Diagnostic Angiography and Renal Angioembolization for Low Grade Renal Trauma: Results from a Statewide Trauma Database**

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**Introduction:** Despite overwhelming evidence supporting conservative management for patients with low-grade traumatic renal injury, contemporary utilization of angioembolization in such patients is largely unknown. We evaluated usage of angiography and angioembolization for renal injuries and assessed differences in utilization based on trauma-level designation.

**Materials & Methods:** All renal injuries presenting at Level 1 and 2 trauma centers from 2000-2013 were identified from the Pennsylvania Trauma Systems Foundation database. Therapeutic intervention codes identified diagnostic angiography and/or renal angioembolization performance while renal injury was designated through AIS codes. Low-grade renal injuries were defined as ≤ AAST grade 3. Performance of interventions was stratified by renal trauma grade and trauma-level designation.

**Results:** Of 3396 patients (median age 27, 76% male), there were 2361 (69.5%) low grade and 1035 (30.5%) high-grade renal injuries identified. Diagnostic angiography and/or angioembolization was performed in 484 patients (14%) overall with fewer low-grade patients (277, 12%) receiving intervention than higher-grade injuries (207, 20%, p < 0.001). Although rate of intervention was similar between Level 1 and 2 centers for patients with grade 2-5 injuries, significantly more Level 1 trauma patients received interventions with grade 1 injuries (15.1% versus 5.4%, p < 0.001).

**Conclusions:** Utilization of diagnostic angiography and/or renal angioembolization for low-grade renal injuries is surprisingly high. Factors accounting for the observed rates of utilization need to be further characterized.

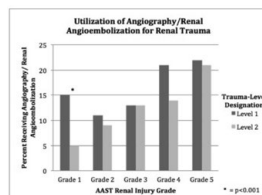


Figure 1. Utilization of angiography and/or renal angioembolization stratified by renal injury grade and trauma level designation. Level 1 trauma centers employed interventional strategies for Grade 1 injuries at a significantly higher rate than Level 2 counterparts (p<0.001).

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**Adherent Perinephric Fat at Minimally Invasive Partial Nephrectomy is Associated with Adverse Perioperative Outcomes and Malignant Renal Histology**

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**Introduction:** Adherent perinephric fat (APF) increases the complexity of minimally invasive partial nephrectomy (MIPN). The Mayo Adhesive Probability (MAP) score can predict APF. Few data exist evaluating the impact of MAP score and APF on MIPN outcomes. We review an MIPN patient cohort to better define these associations.

**Materials & Methods:** 245 patients undergoing MIPN via laparoscopic (n = 108) or robotic (n = 137) techniques were included. APF was determined by keywords in operative notes. Radiographic data was obtained from pre-operative cross-sectional imaging. MAP score was calculated from posterior fat thickness and perinephric stranding. Posterior fat thickness was measured at the renal vein from the renal capsule to the posterior abdominal wall. Perinephric stranding was graded as 0 (none), 1 (mild), or 2 (moderate-severe). Logistic regression determined the association between MAP score and APF with clinical outcomes.

**Results:** 123 men and 122 women with a median age 55 years, BMI 31, tumor size 2.7 cm, and Nephrometry score of 6 were included. Median MAP score was 3 (range, 0 to 5), operative duration 208 minutes, and EBL 150 mL. 26 patients (10.6%) had APF. APF was associated with longer OR duration (p = 0.006), greater EBL (p = 0.02), and malignant renal histology (p = 0.025) at MIPN, Table.

**Conclusions:** Increased MAP score and APF at MIPN are associated with several adverse outcomes. Further work is necessary to delineate the relationship with renal malignancy.

| Associations between adherent perinephric fat and clinical and pathologic variables |                                  |                                  |              |
|---|----------------------------------|----------------------------------|--------------|
| Categorical Variable  | No. pts (%) with APF             | No. pts (%) without APF          | p value      |
| Renal cell carcinoma tumor histology  | 24 (92%)                         | 156 (72%)                        | <b>0.025</b> |
| Complication  | 9 (35%)                          | 55 (25%)                         | 0.297        |
| Major complication  | 2 (8%)                           | 9 (4%)                           | 0.612        |
| Transfusion   | 0 (0%)                           | 4 (2%)                           | 1.000        |
| Stage > T1  | 2 (8%)                           | 12 (8%)                          | 1.000        |
| Fuhrman grade > 2   | 3 (13%)                          | 22 (14%)                         | 1.000        |
| Positive margin   | 2 (8%)                           | 7 (4%)                           | 0.604        |
| Continuous Variable   | Median with APF                  | Median without APF               | p value      |
| OR duration   | 246 min.                         | 207 min.                         | <b>0.006</b> |
| Estimated blood loss  | 200 mL                           | 150 mL                           | <b>0.02</b>  |
| Ischemia time   | 22.5 min.                        | 21 min.                          | 0.433        |
| Change in GFR   | -6.99 mL/min/1.73 m <sup>2</sup> | -8.03 mL/min/1.73 m <sup>2</sup> | 0.815        |

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## Fluoroscopic Roadmapping for Endourology

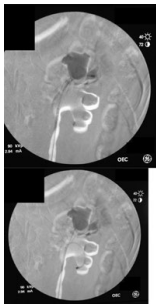
Jared Wachterman, Kevan Sternberg  
University of Vermont Medical Center, Burlington, VT

**Introduction:** During ureteroscopy and percutaneous nephrolithotomy orientation within the kidney is guided by two sources of information. The operator builds a mental map of the collecting system and a retrograde pyelogram can provide a visual snapshot. However, the contrast washes out and the visual reference is removed. In a kidney with complex architecture it can be challenging to navigate.

**Materials & Methods:** Fluoroscopic roadmapping is an imaging process mode commonly used in vascular interventional cases. When used in the kidney a mask is created that acts as a transparent and stable nephrogram. Scopes and wires can be navigated with precision in the absence of visual guidance. We describe this new application and provide initial data regarding use.

**Results:** Fluoroscopic roadmapping has been beneficially applied to ureteroscopy and percutaneous nephrolithotomy. With the collecting system continuously highlighted, complex anatomy can be navigated with confidence and balloon dilators placed with greater precision. Initial qualitative results are encouraging with quantitative results presently being collected.

**Conclusions:** This novel application of fluoroscopy can be applied whenever a pyelogram would be helpful. With additional experience and optimization of the technical aspects this can provide another tool for complex endourologic procedures.



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## A Multi-Disciplinary Approach to Penile Cancer at a Large Tertiary Care Center - 18 Years of Experience.

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**Introduction:** Penile cancer is a rare disease with limited data regarding its management. Penile sparing and Mohs surgery are attractive options for patients with superficially invasive and non-invasive disease.

**Materials & Methods:** We conducted a retrospective analysis of all patients who presented to the urology department with a primary ICD-9 diagnosis of malignant neoplasm of the penis (187.4), glans penis (187.2), genital (187.9), and penis body (187.3) between 1996 and 2014. We also evaluated all patients who presented to the dermatology department and underwent Mohs surgery of the penis between 2005 and 2014.

**Results:** A total of 36 urology and 37 dermatology patients were available for analysis. For the urology patients, 26.5% underwent partial penectomy, 29.4% excision of lesion, 17.6% circumcision, and 20.6% biopsy with laser. Forty-four percent of patients required a lymph node dissection with 57.1% of these patients positive for metastasis. Local recurrence was 32.4%. Median follow up was 25.4 months. Local recurrence for Mohs patients was 5% although median follow up was only 5.2 months. For carcinoma in-situ (CIS), Mohs was associated with a significantly lower rate of local recurrence ( $p = 0.001$ ). When comparing the urology patients that recurred against those that did not, more aggressive surgery (partial penectomy or radical penectomy) was associated with a lower recurrence rate ( $p = 0.005$ ).

**Conclusions:** Penile cancer is a rare disease with various techniques for local control. Mohs surgery is a viable option for CIS or superficially invasive disease. When choosing alternative methods for removal, aggressive surgery is associated with lower recurrence rates.

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## Durable Improvements in Urinary Incontinence and Positive Treatment Response in Patients with Overactive Bladder Syndrome Following Long Term OnabotulinumtoxinA Treatment: Final Results of 3.5-Year Study

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<sup>1</sup>New York University, New York, NY; <sup>2</sup>Rowan University School of Osteopathic Medicine, Stratford, NJ; <sup>3</sup>Evanston Continence Center, Evanston, IL; <sup>4</sup>Royal Hallamshire Hospital, Sheffield, United Kingdom; <sup>5</sup>University of Toronto, Toronto, ON, Canada; <sup>6</sup>Allergan, Inc., Irvine, CA; <sup>7</sup>Allergan, Inc, Bridgewater, NJ

**Introduction:** Here we present the final results from an extension study assessing long term onabotulinumtoxinA treatment (3.5 years) in patients with overactive bladder syndrome (OAB).

**Materials & Methods:** Patients who completed either of 2 Phase III trials were eligible to enter a 3-year extension study in which they received multiple onabotulinumtoxinA (100U) treatments. Data were analyzed for the overall population of patients who received 100U in any treatment cycle ( $n = 829$ ) and within discrete subgroups of patients who received exactly 1 ( $n = 105$ ), 2 ( $n = 118$ ), 3 ( $n = 117$ ), 4 ( $n = 83$ ), 5 ( $n = 46$ ), or 6 ( $n = 33$ ) treatments of the 100U dose throughout the study ( $n = 502$ ).

**Results:** Of the 829 patients enrolled, 51.7% completed the study. Discontinuations due to AEs/lack of efficacy were low (5.1/5.7%); other reasons were not treatment-related. Mean reductions from baseline in urinary incontinence (UI) episodes/day (week 12; co-primary endpoint) were consistent among discrete subgroups who received 1 (-3.1), 2 (-2.9, -3.2), 3 (-4.1 to -4.5), 4 (-3.4 to -3.8), 5 (-3.0 to -3.6), or 6 (-3.1 to -4.1) treatments. A consistently high proportion of patients reported improvement/great improvement on the Treatment Benefit Scale (week 12; co-primary endpoint) in the discrete subgroups across all treatments (70.0-93.5%). Median time to request retreatment was  $\leq 6$  months for 34.2%,  $> 6 - \leq 12$  months for 37.2%, and  $> 12$  months for 28.5% of patients. Most common AE was UTI, with no changes in safety profile over time.

**Conclusions:** Long term onabotulinumtoxinA treatment resulted in consistent reductions in UI and high proportions of patients reporting improvement after each treatment, with no new safety findings.

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## Vesicovaginal Fistula Repair: Perioperative Outcomes of Abdominal Versus Vaginal Approaches

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**Introduction:** Vesicovaginal fistula repair can be approached either from a transvaginal or abdominal approach. The approach often depends on fistulae location and complexity. We sought to assess the perioperative outcomes for each approach using a large multi-institutional prospectively collected database.

**Materials & Methods:** Patients were identified using the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) Participant User Files (2005-2012) and Current Procedural Terminology (CPT) codes for vesicovaginal fistula repair. Results were stratified according to abdominal (51900) versus vaginal (57320, 57330) approach. Complications were an outcome of interest, and multivariable logistic regression models were used to assess the impact of preoperative variables and surgical approach on prolonged operative time and length of stay.

**Results:** Of the 138 vesicovaginal fistula repairs performed during the study period, 38% ( $n = 53$ ) were performed via an abdominal approach and 62% ( $n = 85$ ) via a vaginal approach. Complications were infrequent and did not differ between approaches. The overall complication rate was 10% with the most common complication being urinary tract infection. In multivariable analyses, abdominal approach was found to be associated with both prolonged operative time (Odds Ratio [OR] 7.419,  $p < 0.001$ ) and prolonged length of stay (OR 15.933,  $p < 0.001$ ).

**Conclusions:** In comparison to the vaginal approach, an abdominal approach to vesicovaginal fistula repair is associated with prolonged operative time and prolonged length of hospital stay. There is not, however, a difference in the rate of perioperative complications. These results suggest that, for amenable fistulae, a vaginal approach may be preferred to an abdominal approach.

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**Surgical Management of Sling Related Complications Attributed to Vaginal Mesh**  
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**Introduction:** Many patients experience significant complications associated with transvaginal slings used to treat stress urinary incontinence (SUI). Besides mesh exposure, patients can develop recurrent UTIs, pain syndromes, dyspareunia, and voiding dysfunction long after the initial surgery. Conventional thinking has been to treat these complications conservatively with minimal disruption to the mesh in order to prevent voiding dysfunction. However, many patients do not improve with conservative measures and ultimately undergo multiple revision surgeries. The objective of this study is to evaluate the functional outcomes after surgical excision of the midurethral sling.

**Materials & Methods:** A retrospective case series of patients who underwent transvaginal mesh removal to treat symptoms attributed to initial SUI procedures were analyzed.

**Results:** 31 patients underwent transvaginal sling excision. Mean operative time was 96 minutes. Average patient age was 50 years old and average BMI was 33. Preoperatively, two patients reported isolated urinary symptoms with the rest having documented complaints of pelvic pain, dyspareunia, and recurrent UTIs. Reduction in self-reported pain ( $p = 0.0352$ ) following urethrolysis was observed while finding no evidence of voiding dysfunction ( $p = 0.8036$ ). Increased age had a less favorable outcome as it related to pain though the p-value was not quite significant ( $p = 0.055$ ). People with higher BMI's had better outcomes with respect to pain ( $p = 0.0081$ ). Voiding dysfunction was unaffected by age ( $p = 0.6913$ ) and BMI ( $p = 0.8703$ ).

**Conclusions:** Transvaginal mesh excision (urethrolysis) relieves pain syndromes related to prior midurethral sling procedures without exacerbating voiding dysfunction. Urethrolysis should be considered a treatment option in this patient population.

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**Characterization of Urinary Symptoms in Patients with Idiopathic Normal Pressure Hydrocephalus**  
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**Introduction:** Idiopathic normal pressure hydrocephalus (iNPH) is characterized by ventriculomegaly in association with the triad of gait disturbances, dementia, and incontinence. The purpose of this study was to provide a prospective evaluation of urinary symptoms in iNPH which has never been previously performed.

**Materials & Methods:** In a specialized iNPH clinic, patients with new-onset iNPH were prospectively evaluated by a neurourologist including a detailed history and physical and administration of questionnaires from the International Consultation on Incontinence to assess incontinence (ICIq-UI), OAB (ICIq-OAB), and quality of life (ICIq-LUTqol) related to lower urinary tract symptoms, as well as the AUASS bother scale. Patients were evaluated prior to any neurosurgical (shunt procedures) or urologic treatments or interventions.

**Results:** 55 consecutive patients with iNPH completed the initial evaluation and surveys. Total urinary incontinence score was mild to moderate ( $8.71 \pm 0.64$ : 0-21 scale) with 90.9% experiencing leakage and 74.5% reporting urge incontinence. The most common OAB symptom was 2 times/night nocturia ( $2.2 \pm 0.14$ : 0-4 scale) with urge incontinence the most bothersome ( $3.71 \pm 0.44$ : 0-10 scale). Quality of life impact was moderate ( $4.47 \pm 0.4$ : 0-10 scale) and AUASS bother scale was  $2.89 \pm 0.22$ .

**Conclusions:** Patients with iNPH present with mild to moderate incontinence of which nocturia is the most common symptom and urge incontinence is the most bothersome. To our knowledge, this is the only prospective evaluation of urinary symptoms in patients with new onset iNPH.

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**The Relationship of Self Reported Bladder Impairment with the Standardized Neurological Evaluation in People with Multiple Sclerosis**

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**Introduction:** Urinary incontinence (UI) negatively impacts life participation and quality of life (QOL) in people with MS (pwMS). This may be mitigated by early urological evaluation and intervention. Objective: examine relationship of bladder impairment with the standardized neurological evaluation in pwMS.

**Materials & Methods:** Charts of 86 pwMS presenting between November 1, 2013 and January 30, 2014 were reviewed. pwMS are routinely assessed using Kurtzke's Expanded Disability Status Scale (EDSS) and the Functional Systems Score (FSS). EDSS components extracted for this study include: Cerebellar FSS, Brainstem FSS, Bowel Bladder (BB) FSS, Overall EDSS score, Modified Fatigue Impact Scale (MFIS-5), and Barthel Index (BI). Spearman's correlations were used to examine the relationship between MFIS-5, BI, EDSS and Cerebellar, Brainstem, and BB FSS. All data were assessed using SPSS; alpha level was set at  $<.05$ .

**Results:** At least mild BB impairment was found in 68.7% of our sample. BB FSS was found to have a large relationship to the BI [ $r(81) = -.559, p < .001$ ] indicating BB impairment is associated with decreased ability to perform activities of daily living (ADL). BB FSS has a moderate relationship to overall EDSS score [ $r(81) = .432, p < .001$ ] indicating BB impairment is associated with decreased mobility. BB FSS had a small relationship with brainstem FSS [ $r(81) = .229, p = .037$ ] and MFIS-5 [ $r(84) = .233, p = .034$ ] indicating association between BB impairment and decreased brainstem function and increased fatigue. No correlation found between BB FSS and cerebellar FSS [ $r(84) = .207, p = .061$ ].

**Conclusions:** The relationship between the EDSS and BB FSS suggests a mechanism to prompt early urological evaluation and intervention in pwMS.

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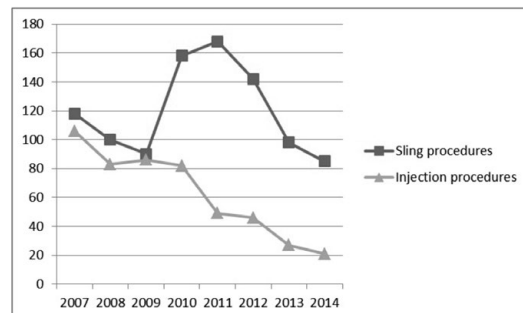
**Changing Practice Patterns for Treatment of Stress Urinary Incontinence**  
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**Introduction:** In 2008 and 2011, the FDA issued notifications regarding adverse events related to the use of transvaginal mesh. However, the effect of these communications on the use of mesh for stress urinary incontinence (SUI) is unclear. The objective of this study was to examine the changes in surgical treatment of SUI during this period at our institution.

**Materials & Methods:** From 1/1/2007 to 12/31/14, surgical case numbers were collected from billing data using the CPT code for sling operations (57288) and transurethral collagen injections (51715) for the treatment of SUI. Data for revision surgery (53500, 57287) were also collected. Pubovaginal slings performed using autologous fascia were identified by codes 20920, 20922, and 20926.

**Results:** Over an 8 year period, 959 sling procedures and 500 transurethral injection procedures for SUI were performed. From 2011 to 2014, the utilization of autologous fascia increased from 2.4% to 14.1%. Mesh revision surgery as a percentage of total SUI sling procedures has increased from 6% in 2011 to 21% in 2014. The number of transurethral injection implants has decreased from 106 in 2007 to 21 in 2014, Figure 1.

**Conclusions:** Since 2011, there has been a steady decline in the number of procedures performed for SUI, including both slings and transurethral injections. Additionally, the use of autologous fascia pubovaginal slings has increased, as well as the number of mesh revision surgeries.



## P15

### Local Treatment Success of Radiofrequency Ablation: Long Term Results from 352 Stage T1a Renal Cell Carcinomas

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**Introduction:** Radiofrequency ablation (RFA) is a minimally invasive treatment option for the management of low stage renal cell carcinoma (RCC). We present long term local oncologic outcomes of our RFA series among patients with stage T1a RCC.

**Materials & Methods:** We reviewed patients who underwent percutaneous RFA for biopsy-proven unifocal stage T1a (size ≤ 4 cm N0 M0) RCC at our institution between 1998 and 2014. Patients with familial RCC syndromes or previous metastases were excluded. Cox proportional hazards regressions were employed to assess tumor (size and RENAL Nephrometry score) and patient (age, Charlson comorbidity index [CCI]) characteristics associated with local recurrence.

**Results:** In total, 352 patients underwent RFA and met inclusion criteria. Median age was 69 years and median tumor size 2.5 cm. Post RFA residual tumor was identified in 22 (6.3%). With median follow up 46 months (Interquartile range 24-70), 23 (6.5%) patients experienced local recurrence. Five and 7-year actuarial recurrence-free-survival were 92% and 87% respectively. In univariate analyses, neither age, tumor size, CCI, nor high RENAL scores (> 9) were predictive of recurrence, although high RENAL score approached significance (hazard ratio [HR] 1.78, p = 0.069). In multivariate analysis including age, CCI, and RENAL score, the association between high RENAL score and recurrence approached significance (Hazard Ratio 1.77, p = 0.070).

**Conclusions:** RFA provides acceptable long term local control for appropriately selected patients with clinical stage T1a RCC.

## P17

### Efficacy of PET/CT and Standard CT for Staging Bladder Cancer

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**Introduction:** Metastatic progression of bladder cancer significantly affects prognosis and treatment pathways. Traditional clinical staging with transurethral tumor resection and CT imaging frequently underestimates the extent of disease. This study evaluates the diagnostic efficacy of FDG-PET in staging bladder cancer.

**Materials & Methods:** Of 110 patients with advanced bladder cancer undergoing PET/CT surveillance from 2008-2012, 30 underwent PET/CT immediately prior to either radical cystectomy or percutaneous biopsy. CT images were examined for metastatic disease defined as lymph nodes ≥ 1.0 cm, lung nodules ≥ 5 mm or any bone/solid organ lesions. FDG-PET images obtained during the same imaging sequence were subsequently reviewed for increased FDG uptake. Positive imaging results were quantitatively analyzed against histopathologic specimens.

**Results:** 30 patients underwent staging FDG-PET/CT, of which 17 (57%) had N0M0 disease by TNM staging versus 13 (43%) with ≥ N1 or M1 pathology identified in tissue specimens, Table 1. CT alone showed a sensitivity of 61.5% and a specificity of 88.2%. The positive predictive value (PPV) for CT was 80.0% and negative predictive value (NPV) was 75.0%. Meanwhile PET/CT showed a sensitivity of 69.2% and specificity of 100%, as well as a PPV of 100% and NPV 81.0%.

**Conclusions:** PET/CT imaging in bladder cancer may improve preoperative staging with fewer false positives that could inappropriately delay surgery. Our preliminary findings support further investigation of PET/CT as an accurate staging modality for bladder cancer.

Table 1

|                | Path ≥ N1 or M1 (n = 13) | Path N0M0 (n = 17) |
|----------------|--------------------------|--------------------|
| PET + (n = 9)  | 9                        | 0                  |
| PET - (n = 21) | 4                        | 17                 |
| CT + (n = 10)  | 8                        | 2                  |
| CT - (n = 20)  | 5                        | 15                 |

## P16

### Conditional Cancer Specific Survival Following Radical Prostatectomy Depends on Preoperative Risk Classification

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**Introduction:** Conditional survival is defined as the likelihood of subsequent survival, given the pre-condition of having already survived malignancy for certain duration. We evaluated whether biochemical recurrence (BCR) free duration is associated with conditional cancer specific survival (CCSS) following radical prostatectomy (RP) for prostate cancer according to D'Amico risk classification.

**Materials & Methods:** Between 1984 and 2013, 13,442 men who underwent RP and had complete follow up data were analyzed. Using Kaplan-Meier estimates, 10-year CCSS probabilities following RP were estimated in men who were free from BCR at postoperative years zero through seven. CCSS was analyzed by D'Amico risk group and compared using the log-rank test.

**Results:** Median follow up after RP was 10 years. Ten-year CCSS rates in the low and intermediate-risk men were consistently higher than 98%, regardless of the duration of BCR-free interval. Among high risk men, 10-year CCSS rates improved with increasing BCR-free interval: from 91.0% after BCR-free duration of zero, to 99.1% after BCR-free duration of 4 years, to 99.7% after BCR free duration of seven years. After BCR-free duration of seven years, there was no difference in CCSS among D'Amico risk classification strata.

**Conclusions:** CCSS rates following RP were excellent in low and intermediate risk men, regardless of the duration of the BCR-free interval. In high risk men, 10-year CCSS improved gradually as a function of BCR-free duration after RP. After a BCR-free duration of 7 years after RP, there was no difference in CCSS between low and high risk patients.

## P18

### Cultured Mouse Bladder Urothelial Cells (mBUC) Release GM-CSF but not Other Cytokines in Response to Lipopolysaccharide (LPS)

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**Introduction:** The host response to bacterial cystitis (UTI) has been poorly studied. It has been suggested that IL-6 and IL-8 were released by different types of cultured BUC in response to infections. We studied freshly cultured mBUC and cytokine release in response to LPS exposure as a surrogate of bacterial infection.

**Materials & Methods:** mBUC from C57BL/6 mice were grown in culture using published techniques and used within 3 days. LPS at 100 ng/mL, 1 µg/mL and 10 µg/mL were used. Supernatant was collected at 24 hours of LPS exposure and assayed using a multiplex ELISA for IL-1α, IL-1β, IL-2, IL-4, IL-6, IL-10, IL-12, IL-17A, IFN-γ, TNF-α, G-CSF and GM-CSF. Splenic cell served as positive controls. Quantitative RT-PCR (q-RT-PCR) for GM-CSF transcript was also performed.

**Results:** LPS induced mBUC to release negligible amounts of every cytokine tested, except for GM-CSF, where a 2-fold increase (normalized for protein content) was detected at the highest LPS dose (p < 0.05 comparing to no LPS exposure). q-RT-PCR showed a dose-response increase in GM-CSF transcript levels, such that at the highest LPS exposure, GM-CSF mRNA was 3.5-fold higher than the untreated control (with data normalized for α-actin transcript levels).

**Conclusions:** It was surprising that mBUC exposed to LPS released only GM-CSF, but this effect was significant. This is the first report of BUC releasing GM-CSF. This finding is significant because GM-CSF is an important mediator of pain pathways (GM-CSF is nociceptive). GM-CSF released by BUC may mediate UTI-related bladder pain, and possibly bladder pain in general unrelated to UTI.



## P19

### Prevalence and Race-based Differences of Suspected Inherited Renal Cell Cancer: Implications for Genetic Counseling Referral and Cancer Susceptibility Syndrome Testing from a 10-year Institutional Experience

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**Introduction:** To gain insight into the scope of patients who may warrant genetic testing for inherited renal cell cancer (RCC), we evaluated the overall prevalence of suspected inherited RCC based on recent consensus criteria and explored race-based differences in specific referral criteria from a 10-year institutional experience.

**Materials & Methods:** We analyzed cancer registry data from 1133 patients (20.1% African American [AA], 76.3% white [Wh], and 3.6% others) who were diagnosed with RCC at our institution from 2004 to 2013. Consensus criteria from the American College of Medical Genetics and Genomics and National Society of Genetic Counselors were used to identify patients with suspected inherited RCC. Referral criteria included clear cell RCC diagnosed at age <50 or papillary RCC (type I or type II). Since early onset RCC is increasingly recognized as an independent indication of hereditary RCC, this was also evaluated.

**Results:** 22% of patients met criteria for referral for genetic counseling. More AA met referral criteria than Wh (29% versus 20%,  $p = 0.004$ ). AA were three times more likely than Wh to present with papillary RCC (15% versus 5%,  $p < 0.001$ ). However, Wh had significantly higher rates of early onset clear cell RCC (56% versus 33%,  $p = 0.004$ ). In the overall cohort, 19% had early onset RCC, with proportionally more AA than Wh (24% versus 17%,  $p = 0.02$ ).

**Conclusions:** 1 in 5 RCC patients warrant referral for genetic evaluation for inherited cancer risk. Race-based differences may exist in referral indications for genetic counseling, which has implications for identifying potential underlying hereditary cancer syndromes.

## P21

### Urinary Levels of Proximal Tubule Proteins are Significantly Elevated in the Setting of Ureteropelvic Junction Obstruction and May Represent Novel Biomarkers

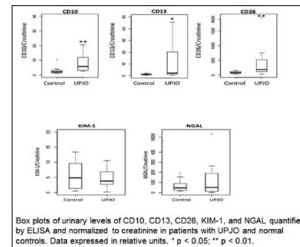
Miriam Harel<sup>1</sup>, Claire Gerber<sup>2</sup>, Miranda L. Lynch<sup>2</sup>, Linda H. Shapiro<sup>1</sup>, Fernando A. Ferrer<sup>1</sup>  
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**Introduction:** Urinary biomarkers have the potential to aid in the diagnosis and management of ureteropelvic junction obstruction (UPJO). Shedding of proximal tubule brush border proteins occurs early in obstructive uropathy. Thus, we hypothesized that urinary levels of the tubular proteins CD10, CD13, and CD26 would be elevated in the setting of UPJO and could represent novel biomarkers.

**Materials & Methods:** A murine model of complete unilateral ureteral obstruction was utilized, and urine was harvested from the obstructed renal pelvis and bladder after seven and ten days. Voided urine was also obtained from 12 patients with UPJO and 12 controls. Murine urinary protein levels were determined using western blotting, and human urine was analyzed with ELISA. Protein levels were normalized to urinary creatinine. Human samples were also tested for the published candidate biomarkers KIM-1 and NGAL.

**Results:** In the murine model, levels of CD10, CD13, and CD26 were increased in urine from the obstructed renal pelvis compared to bladder urine produced by the unligated kidney at both time points tested. These proteins were also significantly increased in urine from patients with UPJO compared to normal controls. No statistical differences were observed in levels of KIM-1 and NGAL between control and experimental groups.

**Conclusions:** Urinary levels of CD10, CD13, and CD26 are significantly elevated in UPJO and may represent novel biomarkers. Further studies are necessary to validate these findings and to determine the correlation of these urinary proteins with renal damage.



## P20

### Integrative Genomics Analysis Revealed microRNA-mRNA Pairings Associated with Prostate Cancer Disparities

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**Introduction:** African Americans (AA) exhibit higher prostate cancer (PCa) incidence and mortality rates compared to European American (EA) men. In addition to socioeconomic influences affecting access to health care, biological risk factors may also play a critical role in PCa disparities.

**Materials & Methods:** To identify the biological elements involved in the differential biological properties between AA and EA PCa, we applied integrative genomics analysis by combining miRNA and mRNA profiling, miRNA target prediction, pathway analysis and functional validation, to map miRNA-mRNA interactions associated with PCa disparities. In this study, we have first identified 22 AA-specific and 18 EA-specific miRNAs in PCa versus patient-matched normal prostate, and 10 'AA-enriched/-depleted' miRNAs in AA PCa versus EA PCa comparisons.

**Results:** Further pathway analyses have revealed that many population-specific and enriched miRNAs-mRNA pairings were over-represented in several oncogenic pathways, including the PI3K/AKT and EGF signaling pathways. Novel miRNA-mRNA pairings were validated by qRT-PCR, western blot and/or IHC analyses in PCa specimens. In-vitro functional evaluations were performed in AA- and EA-specific PCa cell lines and confirmed that miR-133a/MCL1, miR-513c/STAT1, miR-96/FOXO3A, miR-145/ITPR2 and miR-34a/PPP2R2A as critical miRNA-mRNA pairings contributing to the PCa disparities.

**Conclusions:** our data suggest that miRNA-mRNA interactions may play a critical role in the activation of oncogenic pathways in AA PCa, and the AA-enriched/-specific miRNA pairings (such as miR-133a/MCL1, miR-513c/STAT1 and miR-96/FOXO3A) may serve as potential PCa biomarkers and novel therapeutic targets in the treatment of aggressive PCa.

## P22

### In Silico Prediction of Neoantigens Correlates With Pathologic Outcomes in Renal Cell Carcinoma

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**Introduction:** Renal cell carcinoma (RCC) is a common, immunogenic urological malignancy. Missense mutations may result in increased tumor-specific neoantigens and tumor immunoreactivity. The relationship between tumor-specific neoantigens and pathology is unknown. Our aim was to evaluate the relationship between neoantigens and clinicopathologic outcomes using The Cancer Genome Atlas (TCGA).

**Materials & Methods:** TCGA was queried for RCC data that contained whole exome sequencing (WES), transcriptome sequencing (RNA-seq), and clinicopathologic outcomes. For each sample, all possible missense mutations were identified and all possible mutated peptides (neoantigens) were evaluate for immunogenicity. HLA type was computationally predicted from RNA-seq data. HLA-antigen binding affinity was computed using the neural-network based software. All neoantigens with an IC50 < 500 nM were considered capable of eliciting an immune response. Pathologic characteristics of the tumor were correlated with neoantigen count.

**Results:** 147 RCC cases met inclusion criteria. Overall, neoantigen counts ranged from 0-198 (mean = 36, SD = 39). Low grade (Fuhrman 1&2) tumors had significantly more immunogenic neoantigens than high grade (Fuhrman 3&4) tumors (41 neoantigens versus 31,  $p = 0.05$ ). Localized tumors (T1 or T2) had significantly more neoantigens than non-localized (T3 or T4) tumors (40 versus 29,  $p = 0.05$ ). Low grade, localized tumors had significantly more neoantigens compared to high grade and/or non-localized (45 versus 32,  $p = 0.03$ ).

**Conclusions:** Computational prediction of potentially-immunogenic neoantigens demonstrates that lower risk tumors are associated with an increased number of neoantigens. Experimental validation of neoantigens is necessary for further refinement of their prediction and development of immunotherapeutics.

## P23

### Near Infrared Fluorescent (NIRF) Imaging of Bladder Tumors in Fresh, Ex Vivo Specimens after Ph Low Insertion Peptide (pHlip) - Indocyanine Green (icg) Compound (ICG-pHLIP) Intravesical Instillation

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**Introduction:** Early detection of bladder cancer increases the chances of successful treatment. pHlip is a peptide that specifically targets acidic tissue. Conjugated with near infrared ICG dye, a ICG-pHLIP construct successfully differentiates normal from cancerous tissue. We performed ex vivo imaging of human bladder cancer on cystectomy specimens after intravesical instillation of ICG-pHLIP.

**Materials & Methods:** Fourteen patients undergoing radical cystectomy over a five month period were included. The da Vinci Si NIRF imaging system (FireflyR) was used to capture ICG-pHLIP NIRF signal. After removal, bladders were instilled with ICG-pHLIP construct for 1 hour. The bladder was then washed, opened and imaged. ICG-pHLIP fluorescent signal was recorded, tissue was marked for NIRF signal presence and pathologic analysis was performed to correlate with NIRF signals.

**Results:** Thirteen cancerous bladders were targeted by ICG-pHLIP with accurate correlation on final pathology. Six patients had CIS and 2 patients showed high grade dysplasia which likewise was targeted by ICG-pHLIP. In only one case high grade NMIBC and CIS showed no uptake of ICG-pHLIP. NIRF imaging sensitivity and specificity were 92.86% (95% CI 66.06-98.81) and 93.33% (95% CI 67.98-98.89%) respectively.

**Conclusions:** NIRF imaging using ICG-pHLIP successfully targets cancerous acidic tissue in ex vivo bladder specimens. NIRF signal was absent in normal bladder mucosa. This is the first study to show efficient pH dependent NIRF imaging of bladder tumors. The ICG-pHLIP construct could be developed into a novel predictive clinical marker, targeting the acidic environment of bladder tumors after intravesical administration.

## P25

### Transient Receptor Potential Ion Channel A1/V3-Modulator Carvacrol Reduces Detrusor Hyperactivity and Bladder Sensory Signaling

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**Introduction:** Using immunohistochemistry and RT-PCR, we previously documented the presence of TRPV3 in the urinary bladder and its sensory pathways as well as its upregulation in a mouse model of detrusor overactivity. A combination of TRPA1 and TRPV3 antagonists decreases detrusor muscle tone in vitro to a greater degree than either one alone. The goal of this study was to further evaluate the functional role of TRPV3 and to test if the naturally occurring TRPA1 and V3 modulator carvacrol can suppress detrusor hyperactivity.

**Materials & Methods:** Overnight 12-hour micturition frequency were compared between wild type (WT, n = 12) and TRPV3-knockout (n = 14) mice based on the number of urine spots detected on filter paper placed beneath the cage. Using cystometry and multifiber sensory recording, changes in bladder function and its nerve activity were studied in a conscious animal model of acetic acid-induced bladder hyperactivity before and after administration of carvacrol (n = 5).

**Results:** Compared to WT animals, the voiding frequency in TRPV3-knockout animals was 59% longer. In the same group of animals, cystometry recordings showed a significant increase in the inter-micturition interval. Intravesical infusion of 0.25% acetic acid caused a reduction in functional bladder capacity. Adding carvacrol to the intravesical infusion containing acetic acid returned functional bladder capacity and sensory nerve activity to normal.

**Conclusions:** This study provides further evidence that the TRPV3 channel has a functional role in the urinary bladder and that potential therapeutic effect could be increased by synergistically targeting both TRPA1 and TRPV3 ion channels.

## P24

### Utilization of Intravesical Chemotherapy with Nephroureterectomy to Prevent Subsequent Bladder Tumor Recurrence: Results from a National Survey of Urologic Oncologists

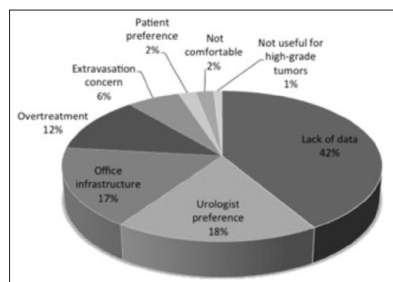
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**Introduction:** Bladder cancer (BC) occurs in up to 50% of patients following radical nephroureterectomy (RNU). Prospective studies suggest that BC recurrence risk is reduced by administering prophylactic intravesical chemotherapy (pIVC) after RNU. We investigated use of pIVC after RNU in urology practices and queried barriers to utilization.

**Materials & Methods:** An electronic survey was distributed to Society of Urologic Oncology members. The survey specifically queried about practice environment, pIVC use, specific regimen, and reasons for not using pIVC.

**Results:** Survey response rate was 22% (158 of 722). Half of respondents were in practice for < 10 years, while 90% performed < 10 RNU annually. Of the 144 urologists performing RNU, only half administered pIVC, including 22 exclusively in patients with a history of BC. One-third administered pIVC intraoperatively. The remainder instilled pIVC ≤ 3 (7%), 4-7 (37%), 8-14 (20%), and > 14 (3%) days post-operatively. 95% performed a single instillation. Agents included mitomycin C (n = 64), thiotepa (n = 5), doxorubicin (n = 2), epirubicin (n = 1), and BCG (n = 1). Amongst respondents who did not administer pIVC, the most common reasons cited included lack of data supporting use, personal preference, and office infrastructure. Figure.

**Conclusions:** Only 50% of urologic oncologists report using pIVC with RNU. Underlying reasons underscore the need for continued dissemination of existing data and additional studies to support its benefits. Moreover, improving logistics of pIVC administration may increase utilization rates.



## P26

### Magnetic Resonance Imaging Targeted Biopsies Alone are Not Sufficient for Detection of Clinically Significant Prostate Cancer - A Systematic Review and Meta-Analysis

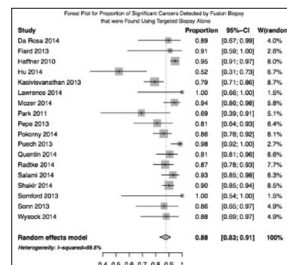
Nathaniel T. Ondeck<sup>1</sup>, Cayce B. Nawaf<sup>2</sup>, Laura A. Skrip<sup>3</sup>, Preston C. Sprenkle<sup>2</sup>  
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**Introduction:** Magnetic resonance imaging targeted biopsies (MRI-Tbx) have the potential to lower the number of cores necessary for prostate biopsy yet not all clinically significant cancers may be identified. Due to unclear diagnostic performance of MRI-Tbx in comparison with fusion biopsy (Fbx) (targeted and systematic), a systematic review and meta-analysis analyzing cancer detection rates was performed.

**Materials & Methods:** A systematic review utilized MEDLINE and Embase (English, post-1990). Only studies reporting cancer detection on a per patient basis for Fbx and MRI-Tbx were included. Clinically significant cancer was defined in each study. For the meta-analysis, effect sizes were calculated as single proportions. Each pooled estimate was derived using the random effects model or the fixed effects model, depending on whether or not there was significant between-study heterogeneity, (I<sup>2</sup> > 50%), respectively. Analyses were conducted using R Statistical Software version 3.0.1.

**Results:** 5,350 publications were reviewed and twenty cohort studies involving 3588 patients were included in the final analysis. MRI-Tbx alone detected 88% of the significant cancers detected with Fbx (95% CI: 0.83 to 0.91). MRI-Tbx had a 45% lower detection rate of clinically insignificant cancer than Fbx (95% CI: 0.32 to 0.57).

**Conclusions:** MRI targeted biopsy alone missed 12% of significant cancers that were captured through fusion biopsy, strongly suggesting that targeted biopsy, without 12-core standard biopsy, is inadequate to detect all clinically significant prostate cancer.



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**Post PCNL SIRS is not a Predictor of Unplanned Readmission**

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**Introduction:** Postoperative Systemic Inflammatory Response Syndrome (SIRS) may be considered an ominous sign. Anecdotally, SIRS is often observed in the otherwise well patient following percutaneous nephrolithotomy (PCNL). We sought to evaluate if SIRS following PCNL is predictive of unplanned 90 day readmission.

**Materials & Methods:** We retrospectively reviewed consecutive patients undergoing PCNL in two dedicated endourologic practices. Patient characteristics collected included demographics and surgical characteristics. SIRS was defined as having two or more of the following: max white blood cell count > 12,000, temperature > 38 degrees Celsius, heart rate > 90, and respiratory rate > 20 within the first 24 hrs following PCNL. Chi square analysis was used to compare readmission rates between SIRS and non-SIRS groups.

**Results:** We identified 382 patients undergoing PCNL, 42% (162/382) that met criteria for SIRS within 24hrs of PCNL. Overall, readmission within 90 days was required in 7.1% (27/382). Reasons for readmission included urosepsis (6/382), UTI (4/382), pneumonia (4/382), AKI (3/382), blood transfusion (1/382), and other non-related medical issues (9/382). Perioperative SIRS was not associated with readmission, with 3.7% of the SIRS patients requiring readmission for UTI or urosepsis compared with 1.8% without SIRS, (p = 0.335).

**Conclusions:** Nearly half of patients undergoing PCNL met criteria for SIRS. Although an ominous prognosticator in other settings, there was no significant correlation between SIRS and 90 day readmission in the postoperative PCNL patient. This may indicate that patient developing SIRS immediately following PCNL may be otherwise safely discharged without increased likelihood of readmission.

**Use of the S.T.O.N.E Nephrolithometry Score to Differentiate Between Infectious and Metabolic Stones Treated with Percutaneous Nephrolithometry**

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**Introduction:** There has been a shift in the stone composition of large renal calculi from predominantly infectious to metabolic. Post-operative infectious complications remain of primary concern with PCNL, especially in the setting of infectious stones. It is difficult to identify whether a stone is infectious, as routine urine cultures are often not predictive. We sought to identify differences in metabolic and infectious stones treated with PCNL using the S.T.O.N.E Nephrolithometry score.

**Materials & Methods:** We retrospectively reviewed patients who underwent PCNL at 3 academic institutions between 2002 and 2014. Stone composition, stone characteristics, patient factors and the S.T.O.N.E Nephrolithometry score were reviewed. Comparisons were made between infectious and metabolic stone groups using Fisher's exact tests and Wilcoxon rank sum tests.

**Results:** 192 kidneys underwent PCNL. 144 (75%) were metabolic and 48 (25%) were infectious. Of the metabolic stones, 51% (73) were calcium phosphate. Infection stones were 63% female and metabolic stones were 46% female. Infectious stones were found to have a significantly higher S.T.O.N.E nephrolithometry score than the metabolic group (mean 9.2 versus 8.1, p < 0.001). The components driving the difference were stone volume (1234 versus 544, p < 0.001) and number of calyces involved (2.6 versus 2.2, p < 0.02). Infectious stones had significantly lower average Hounsfield units (765 versus 899, p < 0.05).

**Conclusions:** The S.T.O.N.E Nephrolithometry score is a useful tool to help identify infectious based renal calculi in the pre-operative setting. This knowledge can assist patient counseling and pre-operative planning. It also may help identify patients that need longer courses of pre-procedure antibiotics.

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**The Natural History of Patients with Simultaneous Bilateral Ureteral Calculi: Presentation, Management, and Postoperative Outcomes**

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**Introduction:** Patients with simultaneous bilateral ureteral calculi (SBUC) can present with acute renal failure, a urological emergency. Conventional urologic practice involves immediate upper tract drainage with subsequent definitive management. This study investigates initial presentation and need for immediate intervention in these patients.

**Materials & Methods:** From 3472 patients with urolithiasis over a 10-year period, 34 presented with SBUC. Records were retrospectively reviewed to identify patient characteristics on presentation, time between diagnosis of SBUC and initial intervention and postoperative outcomes.

**Results:** On presentation, 7 patients (20.5%) had acute renal failure, 4 (11.7%) were anuric, and 8 (23.5%) displayed significant electrolyte abnormalities, primarily acidosis (14.7%). No patients required acute dialysis. Ten (29.4 %) had signs of sepsis or serious infection. Ten (29.4%) were first time stone formers. Median time between diagnosis and intervention was 4 days (0-90). Mean stone size was 6 mm (2-12 mm). Immediate drainage was required in 13 (38.2%) patients, often due to elevated white blood count (29.4%). Fifteen (44.1%) patients underwent single stage bilateral ureteroscopy without ostoperative complications. Overall, serious complications were infrequent, occurring in 5 (14.7%) patients. On ostoperative follow up, only 2 (5.8%) had persistently elevated serum creatinine above baseline. Risk factor analysis identified diabetes, cardiovascular disease, and obesity as being highly comorbid with SBUC.

**Conclusions:** Patients with SBUC can often be managed non-emergently, suggesting that most ureteral stones are only partially obstructing. Moreover, appropriately selected patients have excellent outcomes following single stage bilateral ureteroscopy. Finally, SBUC is more common in patients with documented stone history, suggesting the need for stone prevention.

**Relationship Between Dietary Protein Intake and Urine Oxalate**

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**Introduction:** A single previous study demonstrated that dietary protein intake may be associated with urine oxalate excretion. We evaluated the relationship between dietary protein intake and urine oxalate excretion in a cohort of stone formers.

**Materials & Methods:** A retrospective review was performed of a metabolic stone database at a tertiary care academic hospital. Univariate and multivariate analysis was performed to evaluate the relationship between urine urea nitrogen (a known surrogate for dietary protein intake) and urine oxalate. Multivariate models adjusted for age, gender, body mass index, race, hypertension, diabetes, medications, and urinary constituents (volume, sodium, potassium, phosphorus, creatinine, sulfate, pH).

**Results:** Six hundred two (602) patients were evaluated. Mean age was 52.5 (SD 14.3), mean BMI was 28.3 (SD 6.8), gender prevalence was 37% female: 63% male, 27% of patients had hypertension and 10% of patients has diabetes mellitus. Mean urine oxalate excretion was 38.5 mg/day (SD 15.3). On univariate linear regression, dietary protein intake (urine urea nitrogen) was significantly associated with urinary oxalate excretion ( $\beta = 1.48$ , 95% CI 1.24 to 1.73, p < 0.001). On multivariate logistic regression controlling for confounders, increasing quintile of dietary protein intake was associated with significant increases in urine oxalate excretion (p = 0.03 for trend).

**Conclusions:** Dietary protein intake appears to be significantly associated with urine oxalate excretion. Prospective metabolic studies would be useful to confirm this finding. These data may be used in the future to help counsel stone formers on appropriate dietary therapies.

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## Does Compliance with AUA Best Practice Statement for Antibiotic Prophylaxis Reduce the Risk of Infection-related Readmissions Following Ureterscopy and Laser Lithotripsy?

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**Introduction:** We sought to investigate factors associated with unplanned 30 day readmission for genitourinary infection (URGVI) following ureteroscopy for laser lithotripsy (URSL) including compliance with AUA guidelines (CAUAG) for antibiotic prophylaxis.

**Materials & Methods:** We performed a retrospective chart review evaluating all URSL performed at a single academic institution from April 2011 to August 2014. Characteristics including demographics, comorbidities, surgical encounter characteristics (operative time, index length of stay, ureteral stent duration, staged procedure), preoperative urine culture, antibiotic type/duration, and CAUAG were extracted. Univariate and multivariate regression analysis were conducted to determine factors associated with URGVI.

**Results:** Among 531 patients undergoing URSL, 248 (45%) were female with an average age of 56.8 (+/-14.8) years. Fifteen (2.8%) patients had URGVI. There was CAUAG in 268 (48.75%). Bivariate analysis revealed higher rates of URGVI with longer index length of stay (10.5% versus 2.1%, p = 0.002), operative time > 120 min (6.8% versus 0.8%, p < 0.001), and CAUAG (4.5% versus 1.1% p 120 min (OR 11.9, CI: 2.2-64.6, p = 0.004) and CAUAG (OR 4.64, CI: 1.08 to 19.9, p = 0.039) were associated with increased risk of URGVI.

**Conclusions:** Longer operative time and compliance with AUA guidelines for antibiotic prophylaxis were associated with higher risk of readmission for GU infection. Understanding of local resistance patterns and individualized prophylaxis strategies are imperative rather than uniform application of antibiotic guidelines. Additional study is needed to inform efforts to reduce GU infections after endoscopic stone surgery.

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## Gender-related Dietary Habits are a Predictor of Uric Acid Stone Disease

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**Introduction:** Gender differences have been identified in uric acid (UA) urolithiasis. Intrinsic metabolic differences and BMI have been postulated as causative factors. We sought to evaluate whether diet may be responsible.

**Materials & Methods:** We retrospectively reviewed 932 consecutive stone forming patients (543 men, 389 women) undergoing 24h urinalysis via Litholink at two tertiary care centers. Bivariate and multivariate regression analyses were used to identify significant associations.

**Results:** Women had lower supersaturation of UA (0.84 versus 1.11, p < 0.0001) despite lower volume (1.88 versus 2.01 L, p = 0.02.) This was associated with lower absolute levels of UA (0.56 versus 0.72 g, p < 0.0001), sodium (147.1 versus 187.3 mg, p < 0.0001), and urinary markers of protein intake, sulfate (34.1 versus 47.2, p < 0.0001) and urinary urea nitrogen (UUN) (9.9 versus 13.4, p < 0.0001). Women had higher urine pH (6.14 versus 5.9, p < 0.0001). Evaluating the relationship of gender with dietary factors, female gender was associated with reduced UUN and sulfate (β = -3.6 and -13.1 respectively, p < 0.001). On multivariate regression, it remained a significant predictor of decreased UUN and sulfate, even after adjusting for age, BMI, urine pH, and volume. (β = -2.8 and -10.5 respectively, p < 0.001).

**Conclusions:** Women had decreased UA supersaturation, associated with reduced absolute UA and UA supersaturation. On univariate analysis, this is related to dietary factors (measures of protein intake) as well as protective potential metabolic factors (urinary pH). On multivariate analysis adjusting for pH, volume, age and BMI, we confirmed that dietary factors maintain a significant, independent role in gender-based differences in risk for UA stone disease.

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## An Emergency Department's Adherence to Guidelines for the Evaluation and Management of Nephrolithiasis

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**Introduction:** Recent publications showed significant variation in national practice patterns for the management of nephrolithiasis in the emergency department (ED). The American Urological Association (AUA) and the American Academy of Family Physicians (AAFP) have published guidelines for nephrolithiasis. This study assessed a single institution's ED adherence to these guidelines.

**Materials & Methods:** A retrospective chart review of patients diagnosed with nephrolithiasis was performed at a single institution's ED from 2013 to 2015.

**Results:** 296 patients were diagnosed with nephrolithiasis. Results summarized in Table 1 and Figure 1.

**Conclusions:** Guideline driven evaluation for nephrolithiasis would warrant inclusion of urine analysis and urine culture more frequently in the ED. KUB is an underused modality in this study as both guidelines advocate use for recurrent stone formers. Although, variations in imaging modality for patients at the extremes of age may be due to a wider differential, tighter compliance to non-contrast CT use in the middle aged cohort may represent an area for improvement. Finally MET should be prescribed to a majority of patients with acute renal colic and antibiotics should be given only after urine culture obtained. Implementation of ED specific protocols would provide more effective evaluation and management of renal colic.

|  | First Time Stone Formers | Recurrent Stone Formers | Total % of 296 patients |
|--|--------------------------|-------------------------|-------------------------|
| Percent of Total Patients Diagnosed with Nephrolithiasis | 54.7%                    | 45.3%                   |                         |
| Diagnostic Evaluation                                    |                          |                         |                         |
| No Urine Analysis or Urine Culture                       | 6.2%                     | 6.0%                    | 6%                      |
| Urine Analysis Only                                      | 60.9%                    | 51.5%                   | 57%                     |
| Urine Analysis and Urine Culture                         | 32.9%                    | 42.5%                   | 37%                     |
| No Basic Metabolic Panel                                 | 9.9%                     | 12.7%                   | 11%                     |
| Imaging  |                          |                         |                         |
| KUB Only   | 4.3%                     | 9.7%                    | 7%                      |
| US Only  | 6.2%                     | 23.1%                   | 14%                     |
| KUB and US Only  | 8.7%                     | 9.7%                    | 9%                      |
| CT Abd/Pelvis without Contrast                           | 67.1%                    | 53.0%                   | 60%                     |
| CT Abd/Pelvis with Contrast                              | 13.7%                    | 4.5%                    | 9%                      |
| Management   |                          |                         |                         |
| Discharged Home  | 95.0%                    | 94.0%                   | 94%                     |
| Admitted   | 5.0%                     | 6.0%                    | 6%                      |
| No Narcotics or Tamsulosin Prescribed                    | 20.5%                    | 20.9%                   | 21%                     |
| Prescribed Narcotics Only                                | 31.1%                    | 31.3%                   | 31%                     |
| Prescribed Narcotics and Tamsulosin                      | 41.6%                    | 41.0%                   | 41%                     |
| Prescribed Antibiotics                                   | 11.8%                    | 18.7%                   | 15%                     |
| Prescribed Antibiotics without Urine Culture             | 42.1%                    | 20.0%                   | 21%                     |



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## Percutaneous Antegrade Ureteroscopy for Treatment of Ureterointestinal Anastomotic Strictures

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**Introduction:** Few studies in the literature have examined the efficacy of percutaneous antegrade ureteroscopy with balloon dilation and/or laser incision for treatment of ureterointestinal anastomotic strictures after urinary diversion.

**Materials & Methods:** A multi-center retrospective review of longitudinal medical records was performed. Statistical analysis was performed using the paired t-test.

**Results:** Twenty-six (26) percutaneous antegrade ureteroscopic procedures were performed with balloon dilation and/or laser incision of stricture. Mean patient age was 65.2 years (SD 27), mean time between urinary diversion and treatment for stricture was 44.4 days (SD 72), and mean follow up time was 292.6 days (SD 252). Urinary diversion type was ileal conduit in 77% of cases, colon conduit in 11% of cases, Indiana Pouch in 8% of cases, and orthotopic neobladder in 4% of cases. Successful stricture treatment occurred in 24/26 cases (92.3%) and in 2 cases no treatment could be performed due to complete occlusion of the ureter. At most recent follow up, patients who underwent percutaneous antegrade ureteroscopy and stricture treatment demonstrated significant improvement in serum creatinine compared with before treatment (Cr after treatment = 1.3, Cr prior to treatment = 1.6, p = 0.04).

**Conclusions:** In patients with ureterointestinal anastomotic strictures, percutaneous antegrade ureteroscopy with balloon dilation and/or laser incision of stricture was accomplished in a majority of cases (> 90%) and resulted in significant improvements in renal function. This minimally invasive procedure may be considered prior to more extensive reconstructive surgery in patients with ureterointestinal anastomotic strictures after urinary diversion.



## P27

### Trends in the Use of Mesh for Pelvic Organ Prolapse Surgery

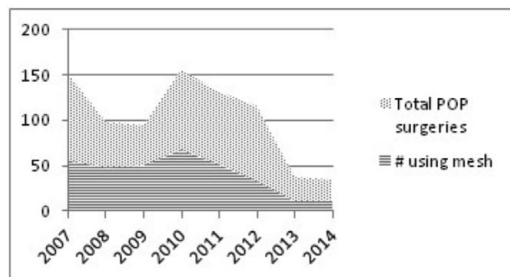
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**Introduction:** In 2008 and 2011, the FDA issued notifications regarding adverse events related to the use of transvaginal mesh for pelvic organ prolapse (POP). The effect of these communications on the treatment of POP is unclear. The objective of this study was to identify any changes in the surgical management of POP at our institution.

**Materials & Methods:** Analysis of surgical volume was performed using billing data collected from CPT codes for POP (45560, 57120, 57240, 57250, 57260, 57265, 57268, 57270, 57280, 57282, 57283, 57284, 57285, 57423, 57425), mesh insertion (57267), and mesh revision from 2007 to 2014.

**Results:** The total number of surgical procedures for POP has decreased from 152 in 2007 to 35 in 2014. The percentage of procedures performed using mesh as a fraction of the total number of POP repairs, has remained stable over this time period, Figure 1. Mesh revision surgery compared to total number of POP procedures has increased from 6% in 2009 to a high of 21% in 2013.

**Conclusions:** The surgical treatment of POP has decreased over time with an associated decrease in mesh utilization. There has also been an increase in mesh revision surgeries. This could be a reflection of the FDA communications on the use of mesh in transvaginal repair of POP. Other factors could also be influencing this trend including changes in referral patterns and socioeconomic changes.



## P29

### Health Insurance Coverage and Self-reported Urinary Incontinence Rates among Women between 20 and 65 Years of Age

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**Introduction:** Health insurance is often necessary for access to effective therapies for urinary incontinence. However, studies have shown that health insurance alone may not result in adequate access or treatment of medical conditions. The degree to which health insurance coverage is associated with health disparities in the urologic population has been understudied. In this study, we investigate the association between health insurance type and rates of self-reported incontinence.

**Materials & Methods:** We used data from the 2005-2010 National Health and Nutrition Examination Surveys to examine incontinence rates among women between 20 and 65 years of age. Insurance status was defined as enrollment in private or government (Medicaid and Medicare) plans. Incontinence was defined as stress, urge, and mixed incontinence. Insurance type was examined in a weighted, multivariate logistic regression for associations with each type of incontinence. All models were adjusted for age, body mass index, race, smoking, diabetes, parity, health status and education.

**Results:** 4,045 women were included in the study. Women enrolled in government sponsored plans were more likely to report stress (OR 1.33; 95% CI 1.04-1.71), urge (OR 2.04; 95% CI 1.53-2.70), and mixed incontinence (OR 2.15; 95% CI 1.63-2.83) relative to women who had private insurance.

**Conclusions:** This study demonstrates that women enrolled in government sponsored plans were more likely to report incontinence symptoms relative to privately insured women. These findings provide additional evidence for disparities in health outcomes by health insurance type. Future studies will investigate the underlying factors responsible for differing rates of incontinence in women by health insurance type.

## P28

### Self-Reported Physical Activity and its Effect on Female Sexual Dysfunction

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**Introduction:** To evaluate the effect of physical activity on Female Sexual Dysfunction (FSD), we report on 110 female subjects who completed a self-reported physical activity questionnaire in addition to the Female Sexual Function Index (FSFI).

**Materials & Methods:** The survey was administered to female patients being seen in the general Urology clinics at West Virginia University. Domain values (desire, arousal, lubrication, orgasm, satisfaction and pain) were obtained by using the FSFI. Additionally, self-reported leisure time physical activity was measured by the Godin Leisure Time Physical Activity Questionnaire and those scores grouped into 3 domains (low, moderate and high).

**Results:** Moderate amounts of physical activity significantly improved ( $p < 0.001$ ) Desire, arousal, lubrication and orgasm compared to both low and high Godin levels. There was no improvement in Satisfaction between the moderate and high Godin levels, but both were significantly increased when compared to low Godin level ( $p < 0.001$ ). Pain was significantly improved by moderate amounts of physical activity compared to both low and high Godin levels ( $p < 0.001$ ).

**Conclusions:** Subjects who self-reported moderate levels of activity as measured by the Godin Leisure-Time Physical Activity Questionnaire exhibited significant improvement in the FSFI domains of desire, arousal, lubrication and orgasm. Further investigation into the effects of exercise and increased physical activity is a source of ongoing investigation.

| DOMAINS      | GODIN - Low<br><14 Units<br>(N=50) | GODIN-<br>Moderate<br>14 to 23 Units<br>(N=23) | GODIN - HIGH<br>>24 Units<br>(N=37) | ANOVA     |
|--------------|------------------------------------|--|-------------------------------------|-----------|
| Desire       | 2.26 ± 0.08                        | 2.74 ± 0.12                                    | 2.65 ± 0.04                         | P < 0.001 |
| Arousal      | 2.43 ± 0.05                        | 3.40 ± 0.15                                    | 2.99 ± 0.09                         | P < 0.001 |
| Lubrication  | 2.71 ± 0.17                        | 3.65 ± 0.17                                    | 3.18 ± 0.22                         | P < 0.001 |
| Orgasm       | 2.45 ± 0.10                        | 3.46 ± 0.07                                    | 3.18 ± 0.22                         | P < 0.001 |
| Satisfaction | 2.81 ± 0.15                        | 3.64 ± 0.21                                    | 3.63 ± 0.27                         | P < 0.001 |
| Pain         | 2.80 ± 0.13                        | 3.56 ± 0.20                                    | 2.78 ± 0.10                         | P < 0.001 |

## P30

### Management of Female Urethral Stricture: A Case Series and Description of Operative Technique

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**Introduction:** Lower urinary tract symptoms (LUTS) in the female patient can be a complex issue to accurately diagnose and treat. Physical exam occasionally reveals a narrow urethra, and cystoscopic evaluation may be limited for this reason. Historically, women noted to have urethral stenosis or narrowing were treated with urethral dilation. Success from this procedure is often short-lived. We describe a technique for distal urethroplasty, including a series of 7 female patients treated at our institution. A review of the literature on management of urethral stricture in women is included.

**Materials & Methods:** Retrospective review of patients having undergone distal urethroplasty by a single surgeon at a tertiary academic medical center between April 1, 2013 and December 1, 2014. Specific focus is directed at presentation, surgical technique, and post-operative outcomes. The MEDLINE database was additionally searched for reports of management of female urethral stricture.

**Results:** Seven women were found to have significant LUTS with an isolated exam finding of urethral narrowing. Subjective symptoms improved post-operatively. Uroflow rates were obtained in three patients and increased flow velocity was noted in these cases. The literature review supports the idea that improved outcomes are noted with reconstructive techniques as opposed to urethral dilation.

**Conclusions:** Distal urethroplasty for female stricture demonstrates subjective improvement in bothersome LUTS. Based on available literature, reconstruction has higher rates of long term success. Future studies are needed to establish measurable criteria to assess and evaluate success pre- and post-operatively.

## P31

### Eat Right and Wake Up Less? Exploring the Link between Socioeconomic and Dietary Factors and Nocturia

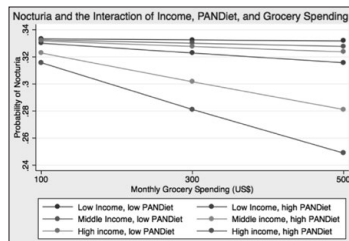
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**Introduction:** Nocturia is a significant healthcare problem in the United States. Prior studies have suggested an inflammatory component to nocturia, and we hypothesized that dietary factors may play a role and may be influenced by spending and socioeconomic status.

**Materials & Methods:** We analyzed cross-sectional data on men and women over age 40 from the National Health and Nutrition Examination Survey between 2007-2010. Data was collected on baseline sociodemographic, clinical, and dietary factors. Dietary intake was converted to a PanDiet quality score. With nocturia as the primary outcome, we performed logistic regression analyses to examine contributing socioeconomic risk factors. We then employed marginal effects to predict how family income, grocery spending, and dietary quality interacted to predict odds of nocturia.

**Results:** Our study cohort included 8,946 individuals. On multivariable logistic regression, increasing quintiles of family income predicting decreased odds of nocturia ( $p < 0.001$ ). The confluence of family income, diet quality, and grocery spending had a significant interaction effect ( $p < 0.001$ ), whereby increased spending on higher quality dietary choices resulted in significantly decreased odds of nocturia, particularly among higher income families, Figure 1.

**Conclusions:** Family income, as manifested by grocery spending and dietary quality, is a robust predictor of nocturia. Given the nationwide impact of nocturia, it may be worthwhile to introduce health policy changes that propagate improved preventive care through access to cheaper higher quality foods.



## P32

### AdVance Transobturator Sling for Post-Prostatectomy Incontinence: Effects of Radiation and Duration of Follow Up on Efficacy and Patient Satisfaction

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**Introduction:** The efficacy of the AdVance transobturator male sling for post-prostatectomy incontinence has been questioned in patients with a history of pelvic radiation. Furthermore, there exists limited data on long term follow up and durability of this procedure.

**Materials & Methods:** We performed a retrospective chart review and follow up surveys of all patients who underwent a post-prostatectomy sling placement for urinary incontinence from 2007 to present. Severity of urinary incontinence was determined by PPD use. Patient satisfaction was determined by willingness to recommend the procedure to a friend. Outcomes were compared between radiated and non-radiated men at both short term and long term follow up intervals.

**Results:** Fifty-two men underwent AdVance Sling placement at our institution from 2007 to present; 18 men had a history of adjuvant radiation. Thirty-six and 16 men were available for short term (mean 19.4 mo) and long term (mean 61.5 mo) postoperative interviews, respectively. Overall, PPD use improvement was seen in both groups. However, patient satisfaction and efficacy decreased with time in both groups, to a much greater degree in radiated patients, Table 1.

**Conclusions:** The majority of patients undergoing AdVance sling placement for post-prostatectomy incontinence saw a reduction in PPD use, and were overall satisfied in both groups at short and long term follow up. The improvements were more pronounced in the non-radiated group. Therefore, the AdVance sling is markedly a more efficacious and durable intervention in radiation-naïve patients.

|                                 | Radiation (n = 14) | Non-radiation (n = 22) | p value |
|---------------------------------|--------------------|------------------------|---------|
| Short term improvement in PPD   | 1.1 (3 to 1.9 ppd) | 2.3 (3.3 to 1 ppd)     | < 0.05  |
| Short term patient satisfaction | 64%                | 95%                    |         |
|                                 | Radiation (n = 6)  | Non-radiation (n = 10) |         |
| Long term improvement in PPD    | 0.8 (3 to 2.2)     | 1.55 (3.3 to 1.75)     | 0.09    |
| Long term patient satisfaction  | 33%                | 80%                    |         |

## P33

### Underactive Bladder is a Volume Hyposensitivity Syndrome and Does Not Predict Detrusor Underactivity

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**Introduction:** Underactive bladder (UAB) is a symptom complex of voiding difficulty. Detrusor underactivity (DU) is the urodynamic observation of insufficient voiding detrusor pressure. Impaired contractility implies detrusor failure. While these terms are often used synonymously, the degree of association is unknown. Objective: to compare urodynamic sensory and motor functions between UAB and DU.

**Materials & Methods:** 198 urodynamic charts were abstracted with IRB approval. Primary symptoms classified as overactive bladder (OAB), underactive bladder (UAB) and incontinence (UI). Primary urodynamic findings were volume hypersensitivity without detrusor overactivity (VH), detrusor overactivity (DO), stress urinary incontinence (SUI), outlet obstruction (BOO), dysfunctional voiding (DV), detrusor underactivity (DU). Volumes at first sensation (FS), first desire (FD), normal desire (ND), and strong desire (SD) were recorded. Maximum Watts factor (WF), age, sex, and postvoid residual volumes (PVR) were recorded. Means were compared with ANOVA. Contingency tables were analyzed. Correlations were sought among continuous variables.

**Results:** 59 patients had a primary symptom of UAB, 27 of DU. UAB and DU were associated with higher volume sensory thresholds than non-UAB, non-DU. Both had larger PVRs than other symptoms/findings. No significant differences among symptom and observation groups were found for WF. UAB as a predictor of DU is 22% sensitive, 89% specific.

**Conclusions:** UAB and DU are associated with increased PVR without necessary loss of contractility. UAB does not require DU. Diminished volume sensitivity characterizes UAB and may relate to the etiology of DU. UAB, DU and impaired contractility are distinct concepts, and the terms are not interchangeable.

## P34

### Photoselective Vaporization of the Prostate (PVP) with GreenLight 180Watt-XPS is Effective in Patients with Urinary Retention

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**Introduction:** Men with BPH can present with urinary retention. The use of GreenLight 180W-XPS, a minimally invasive procedure has not been evaluated for its effectiveness in men presenting with urinary retention. We interrogated a large retrospective database to compare outcomes for men in urinary retention.

**Materials & Methods:** Data on 928 patients with clinical BPH treated with GreenLight 180W-XPS were collected retrospectively from 5 centers. 204 men presented in urinary retention. Several clinical factors were ascertained to document efficacy and safety in men including: procedure time, energy applied in joules, postop catheterization time, IPSS, QOL, PVR and reoperation rates.

**Results:** The total procedure time and amount of energy used were greater in the retention group. However, postoperative IPSS, QOL, length of catheterization, reoperation rate, and proportion with adverse events were all similar between the two groups. PVR in the urinary retention group difference of 24 cc is not clinically meaningful.

**Conclusions:** PVP with GreenLight 180W-XPS is a safe, effective method of treating patients with BPH who present with catheter dependent urinary retention. There was a low reoperation rate and very few adverse events. The results show excellent outcomes with PVP in patients with advanced BPH who present with urinary retention

TABLE 1

| Variable                        | Group               | Ret                 | Non                 | p value |
|---------------------------------|---------------------|---------------------|---------------------|---------|
| Procedure time, min             | 171 (7.32)          | 201 (9.74)          | 365 (8.28)          | < 0.001 |
| Energy applied, J               | 344.5 (208.1-500.9) | 290.8 (161.2-410.4) | 271.4 (178.9-363.9) | < 0.001 |
| Length of catheterization, days | 10.3 (3.14-14.5)    | 11.1 (2.10-10.0)    | 12.4 (1.1)          | 0.209   |
| IPSS, post-op                   | 16.4 (2.1)          | 15.2 (2.0)          | 15.2 (2.0)          | 0.469   |
| QOL, post-op                    | 32.2 (156)          | 32.2 (156)          | 32.2 (156)          | 0.718   |
| Reoperation                     | 14 (3.3)            | 14 (3.3)            | 14 (3.3)            | 0.879   |
| PVR, post-op                    | 164.4 (101)         | 164.4 (101)         | 164.4 (101)         | < 0.001 |

TABLE 2

| Event                   | Time point (days) | Retention <sup>a</sup> | Non <sup>a</sup> | Total <sup>a</sup> | Group difference <sup>b,c</sup> |
|-------------------------|-------------------|------------------------|------------------|--------------------|---------------------------------|
| Urinary tract infection | 90                | 4.5% (9)               | 2.4% (17)        | 2.8% (26)          | 2.1%                            |
| Structure or BMC        | 365               | 2.4% (4)               | 1.5% (13)        | 1.9% (17)          | 0.5%                            |
| Retention               | 90                | 6.4% (13)              | 3.4% (24)        | 4.9% (37)          | 0.5%                            |
| Surgical reoperation    | 365               | 1.3% (3)               | 1.3% (11)        | 1.3% (14)          | 0.6%                            |

## P35

### Predictors For Urinary Retention after Intravesical OnabotulinumtoxinA Injection for Overactive Bladder

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**Introduction:** Intravesical onabotulinumtoxinA (BTN/A) has been approved by the Food and Drug Administration for the treatment of overactive bladder (OAB) in patients who are refractory to anticholinergic medications. One of the risks of this intervention is urinary retention. The purpose of this study was to determine factors that predict urinary retention after BTN/A injection for OAB patients.

**Materials & Methods:** This was a retrospective analysis of patients who received a BTN/A injection at our institution from 2005 to 2013. Patients were excluded if they had neurogenic bladder, a chronic foley catheter, suprapubic tube or intermittent catheterization schedule. Urinary retention was defined as needing a placement of foley catheter and/or requiring straight catheterization. Data was analyzed utilizing general estimating equation (GEE) analyses.

**Results:** Based on the inclusion and exclusion criteria, 111 BTN/A injections among 73 unique subjects were reviewed. Mean age was 69.90 +/- 13.78 and 21% were men; the overall rate of urinary retention was 19%. Preoperative post void residual (PVR) (OR 1.013, 95% CI 1.001-1.024, p = 0.027) and history of stroke (OR 4.63, 95% CI 2.809-7.637, p < 0.0001) were significantly associated with postoperative urinary retention. Age was associated with a decrease in urinary retention (OR 0.96, 95% CI 0.934-1.002, p = 0.066).

**Conclusions:** This data suggests that preoperative PVR and stroke history is a predictor of urinary retention following BTN/A injection. This study also found that as age increased there was a slight decrease in the risk of urinary retention. This suggests that BTN/A injections are well tolerated in the elderly population.

## P37

### Radiographic Parameters to Distinguish Benign Prostatic Obstruction from Concomitant Urethral Stricture

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**Introduction:** Urodynamic parameters (peak flow, pressure/flow, PVR) are often used during the evaluation of patients with urinary retention. Urethral stricture disease can demonstrate the same urodynamic picture as benign prostatic obstruction (BPO), potentially leading to incorrect management. In this study, we examine the radiographic parameters on voiding cystourethrogram (VCUG) and retrograde urethrogram (RUG) that identify stricture patients that have concurrent BPO.

**Materials & Methods:** We reviewed 30 consecutive patients who underwent anterior urethroplasty; 15 with BPO and 15 without. BPO was diagnosed by urodynamics or symptomatic relief with an alpha-blocker. Radiographic characteristics on RUG and VCUG were evaluated by 2 independent reviewers.

**Results:** Features associated with concurrent BPO included narrow bladder neck (BN) width on VCUG (mean 1.0 cm versus 1.8 cm, p = 0.0002), lower BN/prostatic length ratio (0.40 versus 0.57, p = 0.01), BN shape (concave versus convex, p = 0.003), narrowed prostatic urethra on RUG (p = 0.016), bladder trabeculation/diverticula (p = 0.0000003), PVR > 180 cc after VCUG (p = 0.00006), and inability to complete VCUG (p = 0.03). Factors not associated with concurrent BPO and urethral stricture included non-visualization of proximal urethra on RUG (p = 0.063), enlarged bladder (p = 0.12), and closed BN on VCUG (p = 1.0). The multivariable model including BN width, BN shape, trabeculation/diverticula, and PVR showed each additional variable increasing the odds of having BPO 13.4 fold (p = 0.009).

**Conclusions:** Urethral stricture patients with urethrographic findings of narrow BN, low BN/prostatic length ratio, concave BN on VCUG, narrowed prostatic urethra, bladder trabeculation/diverticula, PVR > 180 cc, and inability to complete VCUG, should be counseled that they may need subsequent therapy to treat BPO in addition to their urethroplasty.

## P36

### Subjective Clinical Effectiveness of Percutaneous Tibial Nerve Stimulation: A Single Center Experience

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**Introduction:** Percutaneous tibial nerve stimulation (PTNS) has been shown to decrease the symptoms of bladder dysfunction. We reviewed our data to assess clinical effectiveness of PTNS in a large private practice group.

**Materials & Methods:** Patients were evaluated undergoing PTNS from October 2013 to March 2014. Rates of frequency, incontinence, pads per day (PPD), nocturia, and urgency, were collected for each patient prior to treatment, and subjective data of improvement gathered at conclusion.

**Results:** A total of 64 patients were evaluated. PTNS was completed with twelve sessions by 51 patients (79.7%). Pre-treatment average daytime frequency was 8.75 voids per day. Pre-treatment mean episodes of incontinence were 3.06 with an average 1.93 pads per day, and nocturia was noted to be 3.53 voids per night. Severity of urgency was an average of 2.20 (1-mild, 2-moderate, 3-severe). PPD was not significantly different between patients completing therapy compared to those who did not complete 12 weeks of therapy (1.73 versus 1.75, respectively).

**Conclusions:** PTNS had decreased improvement in symptoms in our study compared to large trials in the literature. Clinicians should consider cost effectiveness and utility of PTNS in patients with limited response and consider alternative treatment.

| Patients Completing 12 Sessions (N=51, October 2013 to March 2015) |              |                |               |               |                         |
|--|--------------|----------------|---------------|---------------|-------------------------|
|  | Worse        | Not Applicable | Stable        | Improvement   | Significant Improvement |
| Frequency  | 2<br>(3.13%) | 0<br>(0.00%)   | 36<br>(70.6%) | 11<br>(21.6%) | 2<br>(3.92%)            |
| Incontinence   | 0<br>(0.00%) | 11<br>(21.6%)  | 21<br>(41.2%) | 16<br>(31.4%) | 3<br>(5.88%)            |
| Nocturia   | 1<br>(1.96%) | 4<br>(7.84%)   | 31<br>(60.8%) | 13<br>(25.3%) | 2<br>(3.92%)            |
| Urgency  | 1<br>(1.96%) | 0<br>(0.00%)   | 26<br>(51.0%) | 23<br>(45.1%) | 1<br>(1.96%)            |
| All Patients (N=64, October 2013 to March 2015)                    |              |                |               |               |                         |
|  | Worse        | Not Applicable | Stable        | Improvement   | Significant Improvement |
| Frequency  | 2<br>(3.13%) | 0<br>(0.00%)   | 49<br>(76.6%) | 11<br>(17.2%) | 2<br>(3.13%)            |
| Incontinence   | 1<br>(1.56%) | 15<br>(23.4%)  | 28<br>(43.8%) | 17<br>(26.6%) | 3<br>(4.69%)            |
| Nocturia   | 1<br>(1.56%) | 4<br>(6.25%)   | 42<br>(65.6%) | 14<br>(21.9%) | 3<br>(4.69%)            |
| Urgency  | 1<br>(1.56%) | 0<br>(0.00%)   | 36<br>(56.3%) | 26<br>(40.6%) | 1<br>(1.56%)            |

## P38

### Factors Predicting Postoperative Urinary Retention in Men Undergoing Lumbar Spinal Fusion

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**Introduction:** Postoperative urinary retention following neurosurgical procedures is a common occurrence. We retrospectively evaluated men undergoing lumbar spinal fusion to determine which factors predict failure of postoperative voiding trial.

**Materials & Methods:** Over a two-year period, 214 men underwent lumbar spinal fusion by a single neurosurgeon. We excluded men with previous prostate or urethral surgery, a history of urinary retention, men taking alpha-blockers or five alpha-reductase inhibitors, and men with prolonged hospital stay, leaving 148 men evaluable. All men left the operating room with a foley catheter in place and were given a void trial on the day of anticipated discharge. Twenty-three men were unable to void after eight hours and had their foley catheters replaced; they were discharged next day with an appointment for urologic follow up. These men were compared to successful voiders with respect to comorbid medical conditions, age, surgical placement of hardware, operative time, lumbar level, multiple level fusion, and surgical approach.

**Results:** Using multivariable analysis, successful postoperative voiders were compared with men who failed the initial voiding trial. Only insulin-dependent diabetes mellitus (p value less than 0.01) and multiple lumbar level surgery (p value less than 0.01) were predictive of initial postoperative failure of voiding trial.

**Conclusions:** Men scheduled to undergo lumbar fusion who have insulin-dependent diabetes or who will require multiple level intervention may benefit from preoperative initiation of alpha blockade at the time of scheduling, as well as an inpatient postoperative urologic consultation.

## P39

### A Method to Study Bladder Urothelial Cellular Function with Preservation of Cellular Location within the Urothelium

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**Introduction:** The bladder urothelium is multilayered. Ability to functionally study urothelial cells while preserving in situ location would represent an advance in bladder urothelial biology.

**Materials & Methods:** Mice were cardiac perfused with PBS. Bladders were excised. Urothelial sheets were dissected off with a microscope (5x magnification). Sheets were stained with H&E. In separate experiments, single cell electrophysiology was performed by placing urothelial sheets in Ringer's bath solution, with either basal or apical surface down. Using 40x magnification, individual urothelial cells from different layers were identified. Potassium currents on these cells were measured in situ using single channel patch-clamp technique.

**Results:** Histology revealed that sheets were free of lamina propria and smooth muscles. The proportion of apical cells, compared to proportion of intermediate and basal cells, with measurable potassium currents was considerably higher (69% of apical versus 16% of intermediate and 18% of basal cells). Of active patches detected in apical cells, 100% of these patches showed a 43 pS current conductance. For intermediate and basal cells, 75–83% demonstrated a 43 pS current and 17–25% demonstrated a 22 pS current. Single cells could also be individually microdissected completely off the urothelium.

**Conclusions:** A novel approach was developed in which individual cells within the multilayered urothelium were identified and functionally studied in situ. Membrane potassium conductances were different from different layers. Single cells from an identified layer can be harvested off the urothelium. This technique allows investigators to study cellular functions while preserving location within the urothelium.

## P41

### Use of Real Time Ultrasound During Urodynamics to Calculate Detrusor Wall Tension

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**Introduction:** During urodynamics, pressure generally increases little during filling. Furthermore, afferent nerve signaling reflects detrusor wall tension rather than pressure. Thus, there is a pressing need for methods that evaluate detrusor wall tension. We describe a novel method to determine detrusor wall tension during urodynamics by incorporating real-time ultrasound.

**Materials & Methods:** As part of an IRB-approved extended urodynamics protocol individuals with OAB defined as ICIq-OAB question 5a  $\geq 3$  had real-time ultrasound during filling. Fill rate was set at 10% cystometric capacity ( $C_{cap}$ ). Ultrasound images were obtained by an ultrasound technologist, holding the probe in a constant position throughout filling to capture mid sagittal and maximum transverse images every 60 seconds. Images were time-linked to bladder pressure ( $P_{ves}$ ) data.

**Results:** Using acquired ultrasound image and  $P_{ves}$  data, we developed an objective technique to calculate detrusor wall tension, wall stress, and wall compliance as follows: From acquired cross-sectional images, we measured wall and luminal areas as well as inner and outer perimeters. Wall tension was calculated as  $P_{ves} \times \text{luminal area}$  and wall stress as wall tension/wall area. While  $P_{ves}$  remained relatively constant during filling, wall stress increased exponentially. Strain was calculated as the change in inner perimeter/inner perimeter at 10% $C_{cap}$ , and compliance as strain/stress.

**Conclusions:** Detrusor wall tension, wall stress, and wall compliance can be calculated by adding real-time ultrasound to standard urodynamics. Furthermore,  $P_{ves}$  measurements do not reflect the underlying state of detrusor wall tension. This technique may be useful in the diagnosis and treatment of OAB and other disorders of voiding dysfunction.

## P40

### Early Continence Results Following Double Layered Urethrovaginal Anastomosis during Robotic Assisted Laparoscopic Prostatectomy (RALP)

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**Introduction:** Adding an external layer to the urethrovaginal anastomosis through double armed circumferential suture between Denonvilliers' fascia and the puborectalis muscle is thought to offer further anatomical support and decrease time to urinary control. We studied the initial post-operative continence experience of patients receiving this double layered anastomotic technique.

**Materials & Methods:** A retrospective chart review of single surgeon RALP cases was performed to determine the time course to full return of urinary control for patients who received either a single or double layered urethrovaginal anastomosis. All patients also participated in our pelvic floor rehabilitation program, including 6 biofeedback sessions. We evaluated the last 20 cases performed with a single layer anastomosis and the first 20 cases performed with a double layer anastomosis at our institution by a single surgeon. Patients were similar (age, race, BMI, cancer stage, pre-op IPSS & bother scores). Continence rates were assessed at the early post-operative intervals of 5 weeks and 3 months.

**Results:** At the 5-week post-operative period, 13/20 (65%) of patients denied urinary leakage or pad use in the double layer anastomosis group versus 8/20 (40%) of patients in the single layer anastomosis group ( $p = 0.11$ ). At 3 months, 16/18 (89%) of patients in the double layer group and 13/20 (65%) in the single arm group were fully continent ( $p = 0.08$ ).

**Conclusions:** Our initial experience with double layered urethrovaginal anastomosis suggests this surgical technique in combination with structured pelvic floor rehabilitation may offer more RALP patients quicker return to continence.

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### Prostatic Urethral Lift for LUTS Secondary to BPH: Prospective Real World Experience

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**Introduction:** The prostatic urethral lift (PUL) is a minimally invasive treatment for symptomatic benign prostatic hyperplasia (BPH). We report a prospective study in a US Urology practice.

**Materials & Methods:** Between July 2014 and February 2015, 53 subjects were enrolled and treated with PUL. Follow up at one month or later included adverse event rate, AUASI (American Urological Association Symptom Index), QOL (Quality of Life), and Qmax (peak urinary flow rate).

**Results:** There were no significant complications. An average of 4.9 implants [range 2-8] were used to treat prostates ranging from 25 to 108 cc (mean 49.3 cc). Adverse events were mild and transient (dysuria and hematuria). No patient reported loss of ejaculatory or erectile function. Prior to PUL, 4 subjects had at one point undergone BPH treatment (2 TURP, 2 microwave), and one patient had undergone prior radiation for prostate cancer. AUASI, QOL, and Qmax all improved significantly, both clinically and statistically. Symptom improvements were in line with randomized controlled study reports; peak urinary flow improvement was higher (8 mL/sec).

**Conclusions:** PUL performs in every day practice in a similar fashion to published controlled studies. Symptoms, flow and quality of life improve significantly, while adverse effects are mild and transient. PUL presents a valuable new treatment for LUTS that offers rapid relief while preserving sexual function.

Table 1: Baseline, follow-up, and change in each paired outcome measure after PUL treatment.

|           | AUA-SI         | QOL            | Qmax            |
|-----------|----------------|----------------|-----------------|
| n         | 30             | 25             | 21              |
| Baseline  | 19.03 ± 5.29   | 4.32 ± 1.14    | 9.21 ± 4.64     |
| Follow up | 11.10 ± 5.96   | 2.32 ± 1.35    | 17.08 ± 5.86    |
| Change    | -7.93 ± 8.28   | -2.00 ± 1.39   | 7.87 ± 6.38     |
| % Change  | -36.9% ± 36.8% | -46.9% ± 25.9% | 119.4% ± 139.1% |
| p value   | < 0.0001       | < 0.0001       | < 0.0001        |



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## Urinary Bother as a Predictor of Post-surgical Changes in Urinary Function Following Robotic Radical Prostatectomy

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**Introduction:** Adverse effects on urinary function are concerns for robotic radical prostatectomy (RRP) patients. Consequently, identifying predictive pre-surgical indices of changes in post-RRP urinary function is of clinical value. We characterized changes in urinary function in RRP patients with pre-surgical voiding symptoms.

**Materials & Methods:** We retrospectively identified 737 RRP patients (April 2007 - Dec 2011) who completed pre- and post-surgical (24 months) EPIC-26 surveys. Survey questions addressed urinary irritation/obstruction (UO), incontinence (UI) and a single question regarding overall bother (UB). Responses were averaged to calculate a urinary sum score (US). Patients were stratified according to baseline bother, and changes in urinary indices at 24 months compared.

**Results:** Men with severe preoperative urinary bother experienced the greatest improvement in median UO, UB and US scores. ( $p < 0.001$ ). Men who were asymptomatic at baseline experienced a decline in US (-2.8). The majority of patients with severe bother experienced positive US outcomes, defined as improvement in scores, while those asymptomatic at baseline experienced negative US outcomes. Using logistical regression, baseline bother was correlated with improvement in both scores with an odds ratio of 2.24 while age, radiation and nerve sparing status were not significantly related.

**Conclusions:** Stratifying patients by baseline urinary bother is a good predictor of changes in urinary function after RRP. Men with severe bother preoperatively experienced an improvement in symptoms after prostatectomy, while asymptomatic men experienced a worsening of symptoms, primarily from mild incontinence. EPIC-26 can be easily administered in the office and help in preoperative counseling of patients regarding expected urinary outcomes.

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## Surgical Chronic Kidney Disease Imparts Attenuated Mortality Risks and Renal Functional Decline than Medical Chronic Kidney Disease

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**Introduction:** Chronic kidney disease (CKD) is associated with risk of all-cause mortality. Radical nephrectomy (RN), or nephron sparing surgery (NSS), results in immediate renal functional decline. Patients may develop CKD after RN or NSS, termed, surgical CKD (CKD-S); however, recent work suggests preexisting CKD (CKD-M) may be a stronger predictor of overall survival (OS) than CKD-S.

**Materials & Methods:** Surgically treated patients from 1994-2014 with available pre/post-operative renal function data were identified in our prospectively maintained institutional registry. Kaplan-Meier (KM) survival curves with log rank statistic were used to assess OS based on pre/post-operative renal function. Multivariable analysis (MVA) was performed using Cox proportional hazard model to evaluate variables f

**Results:** On MVA, CKD-S was not associated with a statistically significant difference in mortality compared with No-CKD (HR 1.2, 95% CI 0.9-1.6,  $p = 0.21$ ). Further, when compared to CKD-M, CKD-S and No-CKD groups had significantly lower risk of mortality (HR 0.76, 95% CI 0.57-1.00,  $p = 0.05$  and HR 0.63, 95% CI 0.47-0.86,  $p = 0.003$ , respectively). Renal functional decline was significantly higher in patients with CKD-M than in patients with CKD-S ( $p = 0.0013$ ).

**Conclusions:** Renal function before and after kidney surgery predicts OS. Survival impact appears to be immediate, suggesting CKD status is a surrogate metric of mortality risk and likely not its primary cause. CKD-S has an attenuated correlation with OS compared to patients with CKD-M. Renal functional decline in CKD-S has slower kinetics compared with CKD-M. As such, these findings support the concept of CKD-S as a distinct subtype of CKD.

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## Intra Operative Radiation Therapy During Genitourinary Surgery: An Initial Experience

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**Introduction:** Intraoperative radiation therapy (IORT) has been shown to provide effective local control (LC) for patients with unresectable and recurrent tumors. Here we present our experience with IORT during GU surgery.

**Materials & Methods:** Since 2006, a multidisciplinary team at our institution has utilized a systematic approach to safely administer IORT. Case selection for IORT includes those in which: 1) preoperative radiation cannot obtain local control (LC) without excessive toxicity and 2) preoperative imaging suggests difficulty obtaining negative surgical margins due to proximity to vital structures, bladder, or bowel.

**Results:** Of 125 patients who underwent IORT from November 2006 to June 2014, 61 (49%) required urological surgery and thus composed our study cohort. Of these cases, 40 (66%) were for treatment of sarcoma (10 of primary GU origin), 13 (21%) for colorectal carcinoma, and 8 (13%) for varying gynecologic or anal malignancies. Mean IORT dose administered was 11.8Gy. Patients underwent radical cystectomy with urinary diversion in 44% of cases, radical nephrectomy in 34%, partial cystectomy in 8%, or another GU resection/mobilization in 13%. Positive margins occurred in 27 (44%) cases. Of 37 (61%) patients with a Clavien 1-5 complication, wound infection (43%), gastrointestinal complication (21%), and neuropathy (13%) were most common. Thusfar, there have been no fistulas, breakdown of anastomoses (either bowel or ureteral) or delayed ureteral injury with IORT. With median follow up of 13 months, 2 year survival is 65%.

**Conclusions:** IORT is a safe and feasible treatment for high risk patients undergoing complex surgery for sarcoma and other soft tissue malignancies.

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## The Effect of Preexisting Diabetes Mellitus and Hypertension on Partial Nephrectomy Utilization for the Treatment of Intraparenchymal Renal Masses

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**Introduction:** Partial nephrectomy (PN) has become the standard treatment for small renal masses, with studies suggesting comparable oncologic outcomes and increased preservation of renal function over radical nephrectomy (RN). The current study examined co-morbidities predisposing to chronic kidney disease and the utilization of PN over RN in treating renal masses.

**Materials & Methods:** The data for the present study came from the Healthcare Cost and Utilization Project Nationwide Inpatient Sample from 2003 to 2012. International Classification of Diseases codes were used to identify patients undergoing partial nephrectomy or radical nephrectomy for a renal mass limited to the renal parenchyma. Patients with preexisting diabetes and hypertension were identified.

**Results:** We identified 66,187 patients who underwent nephrectomy for SRM. Of these, 4,691 (7%) were diabetics, 2,4917 (37.6%) were hypertensive, and 8,770 (13.4%) were diabetic and hypertensive. Patients with preexisting DM or HTN alone were more likely to undergo RN than PN when compared to patients without either comorbidity (OR = 1.1694, 95% CI [1.093, 1.251],  $p < 0.0001$  and OR = 1.042, 95% CI [1.004, 1.080],  $p = 0.027$ , respectively). Patients suffering from both DM and HTN were equally likely to undergo PN or RN (OR = 1.003, 95% CI [0.954, 1.0565],  $p < 0.2531$ ).

**Conclusions:** Contrary to the expected, patients with comorbidities contributing to chronic kidney disease were less likely to receive nephron sparing surgery. More investigation is required to explain these findings and the variables that lead providers to choose RN over PN for the treatment of SRMs in this select cohort of patients.

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**Multicenter Evaluation of Primary Robot-assisted Laparoscopic RPLND in Low-stage Non-seminomatous Testicular Cancer**

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**Introduction:** Retroperitoneal lymph node dissection (RPLND) remains a management option for early-stage non-seminomatous germ cell tumors (NSGCT). Robotic RPLND offers a minimally invasive strategy for the surgical management of this disease.

**Materials & Methods:** Between 2008-2014, 56 patients underwent primary R-RPLND at four centers for CS I-IIA NSGCT. Patient demographics, primary tumor characteristics, perioperative information, pathologic findings, and clinical outcomes were evaluated.

**Results:** 48 (89%) patients were CS I and 8 (11%) were CS IIA. Median operative time was 239 minutes (IQR: 219-271 min), estimated blood loss was 50 mL (IQR: 50-100 mL), node count was 24 (IQR: 18-31), and median length of stay was 1 day. There were 2 intraoperative complications (4%) including 1 open conversion (2%), and 5 early post-operative complications (9%). No late complications were observed and the rate of antegrade ejaculation was 96%. Of the 11 patients (20%) with positive nodes (9 pN1 and 2 pN2), 6 (55%) received adjuvant chemotherapy. There was 1 out-of-template recurrence (2%) which was resected (teratoma). There have been no retroperitoneal or systemic recurrences. At a median follow up of 15 months, the overall recurrence-free rate was 98%, including a 100% recurrence-free rate among patients with pN+ disease without adjuvant chemotherapy (n = 5) at a median of 33 months follow up.

**Conclusions:** Our early multicenter experience supports R-RPLND as a potential management option at experienced centers in select patients with low stage NSGCT. R-RPLND has an acceptably low morbidity profile, but oncologic efficacy evaluation requires longer follow up and observation of low volume pathologic stage II patients.

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**Steps toward Characterization of an OAB-Subtype Mediated by Low Amplitude Rhythmic Contractions**

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**Introduction:** Low amplitude rhythmic contractions (LARC) have been identified in detrusor smooth muscle. Although LARC function is not well-understood, they may play a role in overactive bladder (OAB). The purpose of this study was to correlate *in vitro* LARC in strips of human bladder with *in vivo* LARC identified during urodynamics.

**Materials & Methods:** *In vitro* analysis of LARC was examined by obtaining full thickness bladder strips from uninvolved cystectomy portions in 6 patients. Steady-state tension data were analyzed by fast Fourier transform (FFT) to quantify LARC. *In vivo* analysis of LARC was examined through retrospective review of 100 consecutive blinded urodynamics tracings for signs of LARC on the vesicular (P<sub>ves</sub>) tracing that were not also identified on the abdominal (P<sub>abd</sub>) tracing. Pressure data was normalized and underwent FFT analysis. Identified frequencies were considered distinct if > 3 standard deviations in amplitude above the mean normalized P<sub>abd</sub> amplitude.

**Results:** *In vitro* analysis of LARC using bladder strips identified distinct frequencies at 0.039 ± 0.015 Hz. *In vivo* analysis of LARC in urodynamics studies identified 35 studies that visually displayed LARC. In 12/35 (34%), a distinct frequency of 0.039 ± 0.006 Hz was observed. LARC frequencies were similar in both *in vivo* (bladder strips) and *in vitro* (urodynamics) studies (p = 0.92).

**Conclusions:** Analysis of LARC identified an underlying bladder frequency of 0.039Hz that was nearly identical in both *in vitro* analysis of bladder strips and during *in vivo* clinical urodynamics testing. Further refinements of this technique may help identify sub-sets of individuals with LARC-mediated OAB.

59

**Societal Costs after Localized Renal Cancer Surgery**

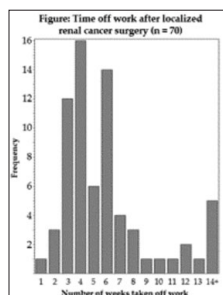
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**Introduction:** The hospital costs of radical or partial nephrectomy are known, but the societal costs of surgery-related time off work (TOW) have not been described.

**Materials & Methods:** To 328 subjects in an IRB-approved prospective multi-institutional renal quality of life study who underwent surgery for localized renal cancer (excluded cytoreductive nephrectomy), we administered an occupational survey that assessed time off work, income, work physicality, and caretaker assistance. We estimated wages lost using individual income and TOW, and used multivariable logistic regression to identify predictors of TOW > 4 weeks.

**Results:** 134 subjects responded to the survey. 84 were employed; 6 did not return to work after surgery. 70 had complete occupational information, and were analyzed. Mean age was 55. 90% underwent minimally invasive surgery. 53% had sedentary jobs. Mean (SD) TOW was 5.9 (3.3) weeks and median (IQR) TOW was 4.9 (3.7 - 6.9) weeks. Mean potential wages lost for TOW was \$10,615 (SD = \$8779). 49% had at least one caretaker take TOW (mean/median caretaker TOW: 12/7 days) to assist post-operatively. Subjects with sedentary jobs were significantly less likely to take more than 4 weeks off (OR 0.30, 95% CI 0.09 - 0.99).

**Conclusions:** Despite advances in minimally invasive surgery, most patients, especially those with non-sedentary jobs, take > 4 weeks off work after renal cancer surgery, which has associated societal costs. This information can help adjust expectations peri-operatively.



P42

**Variable Expression of 5-alpha reductase 2 in Human Prostatic Tissue is Dependent on Methylation in the Epithelial Compartment**

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**Introduction:** We have found that expression of SRD5A2 is variable and absent in 30% of adult human prostate tissues as a result of methylation of its promoter region. Here we expand our findings to a larger cohort, and further hypothesize that expression of SRD5A2 is variable in the epithelium but consistent in the stroma.

**Materials & Methods:** 96 BPH specimens were obtained from patients with symptomatic BPH undergoing TURP surgery. The protein level of SRD5A2 was evaluated by IHC, ELISA and Western blot. Epithelial and stromal compartments were separated by laser capture microdissection. Statistical analyses were performed with JMP Pro version 11.

**Results:** Similar to our previous findings, we found that 35 of 96 (36.5%) patients did not express the SRD5A2 protein and had methylated CpG promoter regions. The epithelium compartment from hypomethylated tissues had decreased methylation of the SRD5A2 promoter, and high expression of the SRD5A2 protein via ELISA and western blot assay. The epithelium from hypermethylated tissues did not express SRD5A2 protein. However, the expression of SRD5A2 and hypermethylation of the promoter region in the stroma was not variable.

**Conclusions:** Our data suggests that the expression of SRD5A2 is not static and ubiquitous in benign adult prostate tissues. While SRD5A2 can be expressed in both prostate epithelium and stroma, epithelial but not stromal methylation contributes to the variable expression of SRD5A2. Expression of SRD5A2, especially in the epithelium may be used as a gene signature to tailor therapies for more effective treatment of prostatic diseases.

P43

**PDL1 Expression in Upper Tract Urothelial Carcinoma**

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**Introduction:** Anti-programmed death ligand (PDL1) therapy has shown promising results in tumors with proven PDL1 expression, including advanced stage urothelial carcinoma of the bladder, however, little is known about PDL1 expression in upper tract urothelial carcinoma (UTUC). We evaluated PDL1 expression in a large series of UTUC.

**Materials & Methods:** We studied 99 patients with UTUC. Tissue microarrays TMAs were stained with PD-L1 (Cell-Signaling, E1L3N, 1:100). The degree of tumoral PDL1 was manually scored. PDL1 positivity was defined as > 5% tumoral PDL1 staining. The primary outcome of the study was the percentage of tumor cells staining positive for PDL1.

**Results:** 62% of our cohort had ≥ pT2 UTUC. Overall, 45% of tumors were of the renal pelvis, 50% of the ureter, and 4% were of both. The overall rate of PDL1 positivity in our cohort was 15%. For patients with ≥ pT2 disease, the rate of PDL1 positivity was 18%. For patients with < pT2 disease, the rate of PDL1 positivity was 11%. Patients with pT4 disease showed the highest rates of PDL1 positivity (4/6, 67%).

**Conclusions:** PDL1 positivity was observed in 15% of patients in this cohort of UTUC, with high rates of positivity in advanced stage disease. Anti-PDL1 therapy is an attractive therapeutic target for patients with UTUC, given that neoadjuvant therapy is underutilized and many patients may not be candidates for standard platinum-based therapies in an adjuvant setting. Further studies will be needed to evaluate clinical response rates in UTUC.

Withdrawn

P45

**Intermediate Effects of the United States Preventive Services Task Force (USPSTF) Recommendation against Prostate Specific Antigen (PSA) Screening on Patient Demographic and Outcomes**

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**Introduction:** Prostate cancer is the second leading cause of cancer death in men in the US. Recently, the USPSTF gave PSA screening for prostate cancer a grade "D", recommending against its use. We aim to study the effects of that recommendation on our patients to determine if this led to patient reticence in seeking treatment, and consequently, more aggressive disease at the time of surgery.

**Materials & Methods:** We retrospectively reviewed charts of 1220 patients who underwent a robotic-assisted prostatectomy by a single surgeon at Washington Hospital Center from 10/2006-08/2014. Patients were divided into pre- and post- USPSTF recommendation according to date of surgery, and were compared by Age, Race, PSA level at surgery, Clinical stage (T2c and below versus T3 and greater), Pre-operative digital rectal exam (DRE) findings, margin status, and Gleason Score (7 or less versus 8 or greater). We used Fisher's exact test and t-test for statistical analysis.

**Results:** 95 patients were excluded due to missing data points, leaving 1125 included for analysis. The results are summarized in this Table.

**Conclusions:** We are seeing a trend towards higher cancer stage and higher PSA at the time of prostate cancer diagnosis as early as 27 months following the USPSTF recommendations. These findings are concerning for a trend toward a pre-PSA era, higher stage prostate cancers at the time of intervention, and overall worse patient outcomes.

|                              | Pre-USPSTF recommendations | Post-USPSTF recommendations | p value  |
|------------------------------|----------------------------|-----------------------------|----------|
| Total number                 | 820                        | 305                         |          |
| Mean age                     | 61.2461                    | 62.0269                     |          |
| Gleason score (8 or greater) | 51/820 (6.22%)             | 23/305 (7.54%)              | 0.4195   |
| Positive surgical margins    | 167/820 (20.37%)           | 78/305 (25.57%)             | 0.1060   |
| T stage ≥ 3                  | 123/820 (15.00%)           | 76/305 (24.91%)             | 0.0002   |
| Abnormal DRE                 | 204/820 (24.88%)           | 71/305 (23.28%)             | 0.6397   |
| Mean PSA                     | 6.5413                     | 8.1809                      | < 0.0001 |

P46

**Paravertebral Block for Post-operative Pain Control after PCNL**

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**Introduction:** To assess the effects of pre-operative paravertebral block (PVB) prior to PCNL.

**Materials & Methods:** A retrospective review of 34 consecutive patients who underwent PVB prior to PCNL was performed and compared to a control cohort of 54 PCNLs who did not undergo PVB (total 88 patients). In the surgical induction area, single shot ultrasound guided PVB was performed. At prone position, the block was done at T10 level with 20-30 mL 0.5% Bupivacaine with epinephrine 1:400,000. PCNL procedures were performed in the prone position under general anesthesia using fluoroscopic guidance and a standard 30 Fr renal access sheath.

**Results:** Thirty-four (34) patients underwent PVB while 54 patients did not. Use of paravertebral block was associated with significantly lower incidence of post-operative nausea/vomiting (11% versus 33%, p = 0.02), lower PACU pain score (2.5 versus 4.7, p = 0.003) and a trend towards lower intraoperative morphine use (5.1 mg versus 7.6 mg, p = 0.06) as well as length of stay (29.8 hours versus 37.2 hours, p = 0.125). PVB patients were slightly older than non-PVB patients (61 years versus 55 years, p = 0.03). ASA class, gender distribution (29% female versus 33% female), stone size (76% greater than 2 cm versus 65% greater than 2 cm), use of nephrostomy tube (41% versus 39%), and BMI (29.2 versus 31.1) and history of preoperative opioid use (14.7% versus 9.3%) were not different between the two groups.

**Conclusions:** PVB was associated with significant improvements in post-operative nausea/vomiting and PACU pain scores.

# Scientific Poster Session IV - General

P47

**Definitive Ureteral Stone Treatment (DUST) Score Predicts Outcomes of Uretroscopic Intervention in Acute Obstructive Uropathy Secondary to Urolithiasis**

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**Introduction:** Stone treatment is often deferred in favor of ureteral stenting amongst patients admitted with symptomatic ureterolithiasis due to concerns for higher complication rates and diminished efficacy. To this point, pre-operative factors that predict treatment success have not been reported. We sought to review our recent experience with emergency ureteroscopy (URS).

**Materials & Methods:** All patients that underwent inpatient URS for acute symptomatic ureterolithiasis from 2010 to 2014 were reviewed. Laboratory and radiographic data were analyzed. Statistical difference was assessed with Student's t-test. DUST score was determined based upon the number of cutoff values a patient was below for rise in serum creatinine ( $\Delta$ Cr) and periureteral density (PUD).

**Results:** 58 of 73 patients (80%) were stone-free (SF). One complication (ureteral perforation) occurred. Stone size, duration of symptoms prior to presentation and serum WBC at presentation did not affect SF-rates. PUD was lower in SF-patients (3.25 versus 23.3 HU,  $p = 0.013$ ) while  $\Delta$ Cr was greater in non-SF patients (0.43 versus 0.24 mg/dL,  $p = 0.02$ ). The SF-rate for PUD  $\leq 5$  HU was 100%, in comparison to 53% for PUD  $> 5$ . The SF-rate for  $\Delta$ Cr  $< 0.3$  was 93%, compared with 48% for  $\Delta$ Cr  $\geq 0.3$ . DUST score of 0, 1 and 2 correlated with SF-rates of 26%, 84% and 100%, respectively.

**Conclusions:** Emergency URS for ureterolithiasis appears to be a safe and effective procedure. Consideration of preoperative factors including periureteral density and rise in serum creatinine can assist in selecting optimal candidates for immediate endourological management.

P49

**The Performance of the 4Kscore for Predicting High-grade Cancer on Biopsy is Independent of Patient Age**

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**Introduction:** The 4Kscore is a blood test combining four kallikrein assays with clinical information in an algorithm. A multisite US prospective study demonstrated that the 4Kscore accurately predicted the probability of high-grade cancer on prostate biopsy (PNBx). The 4Kscore performance was investigated by patient age group for accuracy in predicting risk for aggressive prostate cancer.

**Materials & Methods:** The study enrolled 1012 men referred for PNBx. The 4Kscore prediction of high-grade cancer was calculated without knowledge of the histopathology. Differential calibration by age was assessed using logistic regression modeling and interaction between age and the 4Kscore for the outcome of high-grade prostate cancer.

**Results:** Among the 1012 men in the validation cohort, 231 (23%) were found to have high-grade cancer on prostate biopsy. The median age was 66 (IQR 61,72), which was significantly different than those without prostate cancer [63 (57, 68)] and those with low-grade cancer [64 (IQR 59, 69)] ( $p < 0.0001$ ). There was no significant interaction between age and the 4Kscore in predicting high-grade prostate cancer ( $p = 0.5$ ). The confidence intervals for the difference in AUC between each age subgroup included zero indicating the AUCs for the various subgroups were not significantly different from one another.

**Conclusions:** The 4Kscore accurately predicted the presence of high-grade prostate cancer in a prospective study. There was no significant difference in the performance of the 4Kscore Test for patients of various age groups in determining the need for PNBx.

P48

**Stereotactic Body Radiation Therapy (SBRT) for Clinically Localized Prostate Cancer: The Georgetown University Experience**

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**Introduction:** Stereotactic body radiation therapy (SBRT), the precise delivery of fewer high-dose fractions, may be radiobiologically favorable to conventional low dose fractionation for prostate cancer radiotherapy. We report our early experience using definitive SBRT for treatment of localized prostate cancer.

**Materials & Methods:** Patients treated with SBRT at Georgetown University Hospital for localized prostate carcinoma, with or without the use of androgen deprivation therapy (ADT), were included in this retrospective analysis. Treatment was delivered using CyberKnife<sup>®</sup> SBRT with doses of 35 Gy or 36.25 Gy in 5 fractions. Biochemical control was defined as a rise  $> 2$  ng/mL above nadir (Phoenix definition) and analyzed using the Kaplan Meier method.

**Results:** Five hundred and sixty five patients (236 low, 290 intermediate and 39 high risk) at a median age of 73 years (range, 48-96) received SBRT. A short course of ADT was given to 17%. The median follow up was 30 months. Median pre-treatment PSA was 6.2 ng/mL. The 5-year biochemical relapse free survival (bRFS) rate was 97.6%, 89.6% and 72.7% for low, intermediate and high risk patients, respectively ( $p < 0.001$ ).

**Conclusions:** SBRT for clinically localized prostate cancer is a convenient treatment option with an early biochemical response similar to other radiation therapy treatments. The current evidence supports SBRT as a standard therapeutic option.

P50

**Insignificance of Upstaging Small Renal Masses from Clinical T1a to Pathologic T3a**

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**Introduction:** Small renal masses are primarily managed with partial nephrectomy. A small number of patients who undergoing partial nephrectomy for clinical T1a renal mass will be upstaged to T3a renal cell carcinoma (RCC) secondary to perirenal fat invasion on final pathologic evaluation. The aim of this study was to evaluate oncologic outcomes in clinical T1a tumors which remain pathologic T1a compared to tumors which were upstaged to pathologic T3a.

**Materials & Methods:** A retrospective database was created of all patients with RCC. A query was then performed to identify patients who underwent surgery for a solitary clinical T1a renal mass. Preoperative factors associated with clinical T1a lesions were studied using a multivariate logistic regression analysis. Patients with pathologic T1a RCC were compared to those upstaged to T3a for differences in overall mortality and disease-free survival using log-rank test of Kaplan-Meier survival estimates.

**Results:** The records of 468 patients who underwent surgical intervention for RCC were reviewed of which 213 (46%) patients were identified as clinical T1a. Of the 213 patients with cT1a, 19 (9%) were upstaged to pathologic T3a. Overall mortality analysis revealed that 5 of the 19 patients with pT3a (26%) compared to 36 of the 172 patients with pT1a (19%). Kaplan-Meier survival estimates revealed there to be no statistical differences in overall mortality between the two groups.

**Conclusions:** Clinically diagnosed T1a tumors which are upstaged to pathologic T3a secondary to perirenal fat invasion have similar oncologic outcomes when compared to clinically diagnosed T1a tumors which remain pathologic T1a.



P51

**Can We Prevent Unplanned Readmissions Following Transurethral Resection of Bladder Tumor? A Multivariate Analysis of a Large Single Institution's Experience**

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**Introduction:** There is growing scrutiny of unplanned readmissions (UR) as a cost and quality concern in urological care. Transurethral resection of bladder tumor (TURBT) is a high volume ambulatory surgery that is the largest source of readmission among urological procedures. We sought to evaluate factors associated with UR following TURBT.

**Materials & Methods:** A retrospective review of TURBTs performed at a single academic institution between April 2011 and August 2014 was performed. Demographics, comorbidities, outpatient versus same-day surgery, tumor size, procedure duration, Foley placement, adjuvant mitomycin, length of stay (LOS), anticoagulation, prior biopsy history, referring hospital service area, and insurance type were recorded. Bivariate analysis and multivariate regression analysis were conducted to determine factors associated with unplanned 30-day readmission.

**Results:** Among 708 patients undergoing TURBT, 23.9% were female with an average age of 70 years. Unplanned 30-day readmission rate was 4.7%. Bivariate analysis revealed higher rates of UR with Foley placement, non-aspirin anticoagulation, and LOS > 1 day; preoperative oral antibiotics, aspirin therapy, and prior TURBT were associated with lower risk (p1 day were associated with higher risk, while preoperative antibiotics and aspirin therapy were associated with lower risk of UR (p < 0.05).

**Conclusions:** Patients at increased risk for UR (e.g. those requiring foley placement or prolonged recovery) may benefit from more vigilant postoperative follow up. Interestingly, further distance from the hospital and larger tumor size were not independently associated with UR. Preventing UR is essential to improve the quality and cost effectiveness of urological care moving forward.

P53

**Calculated Insulin Resistance Correlates with Stone-Forming Urinary Metabolic Changes and Greater Stone Burden in High-Risk Stone Patients**

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**Introduction:** Metabolic syndrome and diabetes are associated with nephrolithiasis. Proposed mechanisms of lithogenesis include insulin resistance causing low urine pH and hyperinsulinemia leading to hypercalciuria. Herein, we sought to determine whether insulin resistance was associated with differences in stone burden and lithogenic changes on 24-hour urine samples.

**Materials & Methods:** All patients that underwent comprehensive metabolic work-up including 24-hour urine samples and fasting insulin levels were included. Insulin resistance was defined as a Homeostasis Model Assessment of Insulin Resistance value greater than 5 (HOMA-IR = (glucose\*insulin)/405). Patients on active metabolic therapy were excluded or the 24-hour urine sample pre-dating treatment was utilized for analysis. Stone burden was determined by totaling the maximal diameter of all stones noted on CT.

**Results:** 18 of 30 patients (60.0%) had HOMA-IR > 5. Among patients with calculated insulin resistance, stone burden was greater (17.6 mm versus 6.3 mm, p = 0.002) and 24-hour urine samples revealed higher urine calcium (293 mg/d versus 159 mg/d, p = 0.02) and lower urine pH and citrate (454 mg/d versus 639 mg/d, p = 0.04 and 5.83 versus 6.33, p = 0.04, respectively).

**Conclusions:** Previous studies have demonstrated a correlation between metabolic syndrome, diabetes and nephrolithiasis. This report demonstrates a quantitative increase in stone burden among patients with calculated insulin resistance. The pathway for this greater stone burden may be related to the urinary metabolic changes noted among patients with insulin resistance. In the future, targeting reduction of fasting insulin levels may represent a key element of stone disease prevention.

P52

**Prostate MRI Prior To Radical Prostatectomy (RP): Effects on Nerve Sparing and Pathologic Margin Status**

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**Introduction:** MRI is used for staging prior to RP, and has modest sensitivity for detection of ECE. To see how MRI influences surgical practice, we assessed positive surgical margin (PSM) and nerve-sparing (NS) rates in patients undergoing MRI prior to RP, compared to controls.

**Materials & Methods:** We identified 180 patients that received prostate MRI within 60d of RP at our institution between 2008-2013, and compared them to a non-MRI scanned control group matched by age, PSA, Gleason score, race, BMI, prostate size, and surgery year.

**Results:** PSM rate was 14% in the MRI group, compared to 17% in controls (p = 0.54). ECE rates (21%) were similar. Within the MRI group, 40 (22%) patients had MRIs suspicious for ECE (93% unilateral); 23% of those had a PSM, 67% of which were at the same location as the MRI abnormality. Of the 140 without ECE on MRI, 11% had a PSM. For ECE detection, MRI had a sensitivity = 45%, specificity = 83%, PPV = 41%, and NPV = 83%. NS rates were similar; 93% (MRI group) and 95% (control; p = 0.13). Patients with ECE on MRI had lower rates of NS, 82% versus 95% (p = 0.01).

**Conclusions:** PSM rates are higher when ECE is suspected on MRI, often occurring at the area of MRI abnormality, suggesting that these patients may benefit from even wider resections. Rates of NS were nevertheless high and PSM were low in this contemporary cohort, as ECE noted on MRI is most often unilateral and allows for more aggressive resection on the involved side and judicious NS on the contralateral side.

P54

**Predictors of Readmission Following Kidney Surgery**

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**Introduction:** This retrospective analysis identifies predictors of 30 and 90 day readmission among patients treated for RCC.

**Materials & Methods:** 23,606 patients were culled from the SEER database (Ablation n = 889; partial nephrectomy 2982; radical nephrectomy 19735) and readmission rates were analyzed among all cause and RCC related surgeries.

**Results:** Overall 30 day readmission rate for RCC related surgery was 5% and 7% at 90 days. Laparoscopic approach for radical nephrectomy significantly reduced the likelihood of readmission, OR 0.75, 95% CI 0.62-0.91. Higher stage, charlson score, and age were each identified as significant predictors of 30 and 90 day readmission.

**Conclusions:** This study can guide the surgeon in appropriate preoperative planning to minimize readmissions for kidney surgery. This study also establishes expected surgery outcomes that may be used to set performance standards in the future.

|                   | Ablation (N=664) |        | Partial Ns (N=2772) |        | Total Ns (N=16774) |        |
|-------------------|------------------|--------|---------------------|--------|--------------------|--------|
|                   | OR               | 95% CI | OR                  | 95% CI | OR                 | 95% CI |
| age               | 1.01             | 0.95   | 1.06                | 1.02   | 0.99               | 1.06   |
| year of diagnosis | 1.13             | 0.90   | 1.43                | 1.07   | 0.94               | 1.21   |
| lap yes vs no     | 0.97             | 0.48   | 1.96                | 0.87   | 0.54               | 1.39   |
| stage 2 vs 1      | 5.99             | 0.48   | 75.10               | 3.39   | 1.13               | 10.17  |
| stage 3 vs 1      | 2.20             | 0.24   | 20.02               | 1.88   | 0.93               | 3.78   |
| stage 4 vs 1      | 1.25             | 0.45   | 3.43                | 2.29   | 1.09               | 4.78   |
| stage 99 vs 1     | 2.91             | 0.66   | 12.91               | 1.04   | 0.47               | 2.29   |
| Readmission       | 1.48             | 0.62   | 3.56                | 1.09   | 0.68               | 1.77   |
| charlson 1 vs 0   | 1.87             | 0.84   | 4.17                | 1.43   | 0.91               | 2.29   |
| Black vs NHW      | 0.81             | 0.23   | 2.90                | 0.67   | 0.30               | 1.47   |
| Hispanic vs NHW   | 0.99             | 0.22   | 4.39                | 0.71   | 0.28               | 1.79   |
| Other vs NHW      | 1.51             | 0.42   | 5.44                | 0.58   | 0.18               | 1.86   |
| male vs female    | 0.68             | 0.34   | 1.33                | 1.57   | 1.02               | 2.40   |
|                   | OR               | 95% CI | OR                  | 95% CI | OR                 | 95% CI |
| age               | 0.98             | 0.94   | 1.02                | 1.00   | 0.97               | 1.03   |
| year of diagnosis | 1.02             | 0.85   | 1.21                | 1.01   | 0.92               | 1.12   |
| lap yes vs no     | 0.80             | 0.46   | 1.40                | 0.79   | 0.54               | 1.17   |
| stage 2 vs 1      | 3.11             | 0.26   | 27.01               | 2.02   | 0.69               | 3.96   |
| stage 3 vs 1      | 3.49             | 0.65   | 18.80               | 1.87   | 1.05               | 3.33   |
| stage 4 vs 1      | 2.22             | 1.10   | 4.46                | 2.34   | 1.30               | 4.21   |
| stage 99 vs 1     | 1.98             | 0.64   | 6.13                | 0.97   | 0.53               | 1.78   |
| charlson 1 vs 0   | 1.19             | 0.60   | 2.35                | 0.98   | 0.67               | 1.44   |
| Black vs NHW      | 1.59             | 0.86   | 2.94                | 1.29   | 0.89               | 1.86   |
| Hispanic vs NHW   | 0.83             | 0.32   | 2.13                | 1.07   | 0.63               | 1.82   |
| Other vs NHW      | 0.88             | 0.26   | 3.03                | 0.83   | 0.41               | 1.68   |
| male vs female    | 0.76             | 0.22   | 2.67                | 0.59   | 0.24               | 1.47   |
|                   | OR               | 95% CI | OR                  | 95% CI | OR                 | 95% CI |
| age               | 0.98             | 0.94   | 1.02                | 1.00   | 0.97               | 1.03   |
| year of diagnosis | 1.02             | 0.85   | 1.21                | 1.01   | 0.92               | 1.12   |
| lap yes vs no     | 0.80             | 0.46   | 1.40                | 0.79   | 0.54               | 1.17   |
| stage 2 vs 1      | 3.11             | 0.26   | 27.01               | 2.02   | 0.69               | 3.96   |
| stage 3 vs 1      | 3.49             | 0.65   | 18.80               | 1.87   | 1.05               | 3.33   |
| stage 4 vs 1      | 2.22             | 1.10   | 4.46                | 2.34   | 1.30               | 4.21   |
| stage 99 vs 1     | 1.98             | 0.64   | 6.13                | 0.97   | 0.53               | 1.78   |
| charlson 1 vs 0   | 1.19             | 0.60   | 2.35                | 0.98   | 0.67               | 1.44   |
| Black vs NHW      | 1.59             | 0.86   | 2.94                | 1.29   | 0.89               | 1.86   |
| Hispanic vs NHW   | 0.83             | 0.32   | 2.13                | 1.07   | 0.63               | 1.82   |
| Other vs NHW      | 0.88             | 0.26   | 3.03                | 0.83   | 0.41               | 1.68   |
| male vs female    | 0.76             | 0.22   | 2.67                | 0.59   | 0.24               | 1.47   |

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### **Maximum Tumor Diameter of 1 cm as Predictor of Biochemical Recurrence in the Men with Organ Confined Prostate Cancer**

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**Introduction:** Conflicting data exists on the role of maximum tumor diameter (MTD) as a predictor of biochemical recurrence (BCR) in men with organ confined prostate cancer with negative surgical margins after radical prostatectomy (RP). We evaluate MTD in a large contemporary patient cohort.

**Materials & Methods:** RP from a single-institution database were studied (2000-2012). Inclusion criteria: organ-confined pathology (pT2a-T3a), negative surgical margins, no adjuvant therapy, and minimum 12-month follow up. The largest tumor diameter (MTD) of the largest tumor focus was prospectively measured. Chi-squared test and odds ratios comparing MTD and BCR for tumors  $\leq 1$  cm and  $> 1$  cm in each of the following categories were calculated: overall group, Gleason 3+3, 3+4, 4+3, and Gleason score 8,9 and 10.

**Results:** Median follow up was 58 months. BCR and mean MTD overall was 73/1048(6.9%) and 1.5 cm, in 3+3 9/337 (2.6%) and 1.1 cm, in 3+4 30/482 (6.2%) and 1.6 cm, in 4+3 25/185 (13.5%) and 1.6 cm, and in the 8, 9, 10 group 9/45 (20%) and 1.3 cm. In the overall group, MTD  $> 1$  cm showed a significant increase in BCR compared to  $\leq 1$  cm ( $p < 0.04$ ). Odds ratio trends were largest in the overall, 3+3 and 3+4 groups (but not statistically significant), though this trend was not found in the higher grade groups.

**Conclusions:** Prostate cancers  $> 1$  cm are associated with increased risk of BCR. This effect appears to be most pronounced with low grade tumors, as predominantly high grade tumors have increased risk for BCR even at MTD  $\leq 1$  cm.