Podium Session 2: Oncology
June 24, 2012, 1330-1430

POD-02.01

MDV3100, an Androgen Receptor Signaling Inhibitor (ARSI), Improves Overall Survival in Prostate Cancer Patients Post-docetaxel; Results from the Phase 3 Affirm Study

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Introduction and Objectives: MDV3100, a novel ARSI, competitively inhibits binding of androgens to the androgen receptor (AR), inhibits AR nuclear translocation, and inhibits AR-DNA binding. MDV3100 was developed based on activity in prostate cancer cell model systems with overexpressed AR and was active in a Phase 1-2 trial of prostate cancer patients with progressive castration resistant disease (CRPC). The AFFIRM trial evaluated if MDV3100 could prolong overall survival in CRPC patients post docetaxel.
Methods: In this randomized, double-blind, placebo-controlled, multinational Phase 3 study (NCT00974311), patients who had ≤2 docetaxel-based regimens were randomized 2:1 to MDV3100 160 mg/d or placebo. Corticosteroids were allowed but not required. Patients were stratified by baseline ECOG performance status and mean brief pain inventory score. The primary endpoint was overall survival (OS). Secondary efficacy endpoints included radiographic progression-free survival, time to first skeletal-related event, and time to PSA progression.
Results: 1,199 patients were randomized between Sept 2009 and Nov 2010. Based on a planned interim analysis at 520 death events, the Independent Data Monitoring Committee recommended halting the study and placebo patients offered MDV3100 due to a significant OS benefit. Patients on MDV3100 had a median OS of 18.4 months, an increase of 4.8 months compared to placebo (13.6 months), $p<0.0001$, hazard ratio 0.631. Results for the secondary endpoints and safety will also be presented.
Conclusions: MDV3100 significantly improved OS in men with post-docetaxel CRPC reducing the risk of death by 37% compared to placebo.

POD-02.02

Neoadjuvant Gemcitabine/Cisplatin Chemotherapy for Muscle Invasive Urothelial Carcinoma of the Bladder: a Single Institution Experience

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Introduction and Objectives: Despite evidence of a survival advantage for neoadjuvant (NA) cisplatin-based chemotherapy (CT) prior to radical cystectomy (RC) for muscle invasive urothelial carcinoma (UC), treatment rates are low. A number of Canadian centres use NA gemcitabine/cisplatin (GC) but there is little data on pathologic response rate, an important predictor of long-term outcome. This retrospective study was undertaken to determine the rate of NA GC use prior to RC at our institution and to assess the pathologic response rates.

Table 1. POD-02.02

Variables	NA Treated	RC only	*p*-value
Complete Down-staging (pT0N0)	19/91 (21%)	2/69 (3%)	0.001
Non-Invasive only (pT0/ pTis/pTaN0)	34/91 (37%)	7/69 (10%)	0.0001
Organ confined disease (pT0–pT3aN0)	55/91 (60%)	23/69 (33%)	0.0006
Lymph node positive (pN+)	22/91 (24%)	23/69 (33%)	*p*=0.06
Median Overall Survival	51 months	31 months	*p*=0.07
4-yr Survival Rate	55%	43%	

NA: neoadjuvant; RC: radical cystectomy.

Methods: A retrospective chart review was performed on all patients (pts) undergoing RC between 2007.01.01 to 2011.06.30 at our institution. Data were collected on demographics, clinical stage, type and amount of NA administered, and postoperative pathology.
Results: A total of 251 RC were performed: stage T2-T4 UC 166 patients; non-muscle invasive UC in 85 patients; and in 6 patients as salvage treatment. 91 (57%) pts received NA GC and 69 (43%) pts went straight to RC. Reasons for no NA GC being given include: medical contraindication in 37 pts (54%); pt refusal in 9 pts (13%); and lack of referral to Medical Oncologist 23 pts (33%). Pathological staging and survival rates are presented in Table 1.
Conclusions: The rate of NA CT use prior to RC at our institution is higher than quoted in published literature. The use of NA GC combination improves the chances of achieving a pT0 status and down staging of the UC in the RC specimen at rates comparable to those reported for MVAC.

POD-02.03

Regional Differences in Practice Patterns and Outcomes after Radical Cystectomy

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Introduction and Objectives: To assess differences in practice patterns and outcomes across three separate regions in a universal health care system in patients who had undergone radical cystectomy.
Methods: This multi-institutional series included 2287 patients who had undergone radical cystectomy at eight Canadian centres from 1998 until 2008. Collected variables included various clinical and pathological parameters, recurrence, and death stratified into three sets to account for the different regions (east, centre, west).
Results: Of 2287 patients, there were 1105 patients from eastern (group 1, 49%), 601 patients from central (group 2, 26%), and 581 from western Canada (group 3, 25%). The median follow-up of group 1, 2 and 3 was 22.1,

17.1, and 28.6 months respectively. There were no differences among the three geographical locations in terms of pathologic stage, rate of surgical margin positivity, adjuvant chemotherapy and smoking status. Rates of neoadjuvant chemotherapy were higher in group 2 compared with group 1 and 3 (p=0.07). There were statistically significant differences in clinicopathological parameters across the 3 groups, specifically gender distribution, performance of a lymphadenectomy, type of diversion and rates of concomitant carcinoma in situ (cis), and lymphovascular invasion. The mean number of days to cystectomy from last transurethral resection (TURBT) was 50 vs. 79 vs. 69 days for groups 1, 2 and 3 respectively (p=0.0006). On Kaplan-Meier survival analysis, there was a statistically significant difference (p<0.0001) in overall survival (53.6% vs. 66.8% vs. 52.4% for groups 1, 2 and 3).
Conclusions: Significant variations in practice patterns were noted across different geographic regions in a universal health care system. The use of orthotopic bladder substitutes remains low across all 3 regions. Treatment delays are prolonged across Canada with significant regional variations.

POD-02.04

The Association between Statin Medication Use and Progression after Surgery for Localized Renal Cell Carcinoma

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Introduction and Objectives: Studies examining the association between statin use and renal cell carcinoma (RCC) are inconsistent. To date, no study has examined the influence of statins on progression of RCC.
Methods: 1765 patients with localized clear cell RCC treated surgically from 1995- 2010 were studied. Cox proportional hazards models were used to evaluate the relationship between statin use at surgery and time to local recurrence or progression (Progression=metastases or death from RCC). Models were adjusted for age, gender, race, partial vs. radical, year of surgery, Charlson comorbidity, stage, presenting symptoms, and preoperative glomerular filtration rate (GFR).
Results: 483 (27%) patients were on a statin at surgery. Statin users were operated on more recently (median 2006 vs. 2004, p<0.001), had higher Charlson scores (median 3 vs. 2, p<0.001), lower preoperative GFR (median 64.9 vs. 70.2 mL/min/1.73 m2, p<0.001), and were more likely to have undergone a partial nephrectomy (58 vs. 50%, p<0.001). With a median follow-up of 3.2 years, there were 23 local recurrences and 176 progression events. Statin use was associated with a reduced risk of local recurrence after surgery (HR 0.24, 95% CI 0.06-0.98, p=0.05), however CIs were wide due to few recurrences. Statin use was also associated with a 38% reduction in the risk of progression after surgery (HR 0.62, 95% CI 0.42-0.93, p=0.02). The reduced risk of progression for statin users was duration dependent (p-trend=0.01). Statin use <3 years was not associated progression (HR 0.86, 95% CI 0.49-1.48, p=0.58) while statin use ≥3 years was associated with a 50% reduction in the risk of progression (HR 0.47, 95% CI 0.28-0.78, p=0.004).
Conclusions: In our cohort, statin use was associated with a reduced risk of progression after treatment for localized clear cell RCC. If our findings are validated in other cohorts, it may be prudent to prospectively evaluate if statins protect against progression after local resection.

POD-02.05

Does Surgeon and Hospital Volume Impact Outcomes of Surgery for Renal Cell Carcinoma with Inferior Vena Caval Involvement? Results of a Canadian Population-based Study

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Introduction and Objectives: In several major surgical procedures, an association with provider volume and outcomes has been seen, justifying a centralization of these procedures. Radical nephrectomy with removal of inferior vena cava (IVC) thrombus is a rare, but large and complex operation in urology. Using Canada-wide population based data, we determined to assess whether surgeon or hospital volume had an effect on in-hospital mortality or complications.
Methods: The Canadian Institute for Health Information (CIHI) administrative codes were used to identify all nephrectomies associated with an IVC thrombus performed in 9/10 provinces from 1998-2007. The CIHI discharge abstract database was used to determine in hospital mortality and complications for the hospital admission at time of surgery. Multivariate logistic regression analysis (MVA) was performed to assess the impact of surgeon and hospital volume on in-hospital mortality and complications, adjusting for age, sex, comorbidity (using modified Charlson score), year of surgery, and region.
Results: During the study period, 816 radical nephrectomies associated with venous thrombus were performed on 521 men and 295 women. The in-hospital mortality rate was 7%. Median length of stay was 10 days. Complications were noted in 633 patients (78%). Age and comorbidity were the strongest predictors of in hospital mortality on MVA. MVA showed a trend to lower in-hospital mortality with higher surgeon volume which was significant at the highest quartile (OR for highest vs. lowest quartile 0.42 [0.0.18-0.98; p=0.05]). There was no trend for hospital volume. The effect of hospital and surgeon volume on all and surgical specific complications was mixed.
Conclusions: For radical nephrectomies associated with IVC thrombus, increasing surgeon volume, but not hospital volume, corresponded to lower in-hospital mortality rates. Age and comorbidity remain the strongest predictors of in-hospital mortality.

POD-02.06

The Association between Renal Tumor Scoring System and Partial Nephrectomy Complications

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Introduction & Objectives: Three renal mass scoring systems have been proposed to quantify difficulty of partial nephrectomy and risk of surgical complications. This study was designed to evaluate the associations between each renal tumor scoring system and complications.
Methods: A consecutive cohort of partial nephrectomy patients between 2002-2009 was analyzed. Patient characteristics were abstracted from the medical record. R.E.N.A.L Nephrometry Score, PADUA score and C Index were determined from preoperative axial images by two independent reviewers. Patients were evaluated for postoperative complications up to 30 days following surgery. Pre-specified complication definitions were used for 33 potential complications and severity of each complication was described using the Clavien classification system.
Results: A total of 118 patients were included in the study. Median R.E.N.A.L. score was 7 (IQR 5-8), median PADUA score was 8 (IQR 7-9.8) and mean C index was 3.9 (SD 2.10). A total of 76 complications were recorded. There were no deaths. There were 18 Grade I, 40 Grade II, 5 Grade IIIa, 4 Grade IIIb and 9 Grade IVa complications. There were no Grade IVb or V complications. Nephrometery score was associated with overall complications (mean score 7.0 vs. 6.4, p=0.04) and genitourinary specific complications (mean score 7.7 vs. 6.5, p=0.003) respectively. PADUA score was also highly associated with overall (mean 8.8 vs. 8.1 p=0.01) and genitourinary specific complications (mean 9.7 vs. 8.2, p=0.0002). Mean C index score was not significantly associated with overall or genitourinary specific complications.
Conclusions: Renal tumor scoring systems are useful tools to predict risk of complications after partial nephrectomy. Tumor scores should be taken into consideration in the decision making process of partial vs. radical nephrectomy. Prospective studies are required to further evaluate if one scoring system is a superior predictor for surgical complexity.

Podium Session 3: General Topics
June 25, 2012, 1020-1120

POD-03.01

Laparoscopic Ureteric Clipping: a Simple Alternative in the Treatment of Ectopic Ureters Associated with a Non-functioning Upper Moiety

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Introduction and Objectives: Surgical management of symptomatic ectopic ureters associated with a non-functioning upper moiety (EU/NFxUM) is controversial. Both the upper (heminephrectomy) and lower pole (ureteroureterostomy or reimplantation) approaches offer potential risk of damaging the ipsilateral lower pole functioning unit. Herein, we present a simplified novel approach for management of EU/NFxUM, laparoscopic ureteric clipping (LUC).

Methods: Prospectively collected data on 4 consecutive females that underwent LUC for ectopic ureters associated with incontinence between February and October 2011. Surgical technique consisted of cystoscopy and insertion of ureteral catheter in the lower pole ureter to aid in identifying and clipping the EU, which was achieved by standard trans-peritoneal supine laparoscopy.

Results: Mean age was 8.5 years (range 5-14). In all patients, diagnosis was based on clinical findings supported by ultrasound (US), magnetic resonance urography (MRU) and DMSA scans. Bilateral complete duplication was present in 2 patients. The combination of cystoscopy and laparoscopy allowed adequate identification of the ectopic ureter that was causing problems in both of them, followed by LUC. All patients in the series were dry immediately postoperatively and remain asymptomatic after a maximum follow-up of 6 months. They all have developed some degree of asymptomatic upper pole hydronephrosis on follow-up US.

Conclusions: Laparoscopic clipping holds promise as an alternative in the treatment of EU/NFxUM. Furthermore, in cases where diagnosis is not straightforward and imaging studies are inconclusive, combination of cystoscopy and diagnostic laparoscopy was reliable in identifying the EU that was causing problems. In this admittedly small series, all patients had complete resolution of incontinence without complications. Further follow-up is warranted to determine the fate of expected NFxUM hydronephrosis.

POD-03.02

The Association between Continence, Shunt, and Quality of Life in Spina Bifida

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Introduction and Objectives: Advances in the care of the Spina Bifida (SB) patient have resulted in markedly decreased mortality rates. Therefore, contemporary management must focus on quality of life (QOL), of which, the urinary tract is of primary importance. The main objective of this study is to look at urinary tract management, continence, and if the presence of a ventriculo-peritoneal (VP) shunt affects QOL.

Methods: After appropriate ethics approval we initiated a prospective study using multiple validated QOL instruments including: Health Related QOL-SB (HRQOL-SB), Ped's QOL 4.0, Incontinence Severity Index-Pediatrics (ISI-P), Pediatric Incontinence QOL (PinQ), and Hydrocephalus Outcome QOL (HOQ). Continence was strictly defined as <1 episode/week, and was determined via the questionnaire.

Results: The overall HRQOL-SB score for the entire sample population (n=40) was 86%, and continence rate was 35%. The presence of a VP shunt (n=14) did not affect continence or urinary specific QOL (ISI-P and PinQ). However, VP shunts were associated with lower overall QOL (Ped's QOL 4.0, $p<0.005$), however, this effect was negated with the HRQL-SB tool. When comparing continence rates between the VP shunt and no-VP shunt population, there were significant differences in PinQ ($p<0.005$ and $p<0.05$). Conversely, no significant differences were seen for HRQOL-SB or Peds QL 4.0. Furthermore, there were no differences seen within the VP shunt population when comparing scores on the HOQ when grouped according to continence.

Conclusions: This data suggests that overall SB specific QOL does not seem to be related to continence or a VP shunt. However, urinary specific QOL is dependent on continence and is influenced by a VP shunt. Although quality of life secondary to urinary symptoms is of paramount importance to this population, we must consider the multitude of other factors involved.

POD-03.03

Does Antibiotic Prophylaxis Prevent Urinary Tract Infections in Infants with Antenatally Detected Hydronephrosis? A Systematic Review and Meta-analysis

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Introduction and Objectives: Antibiotic prophylaxis (ATB) has been recommended empirically in newborns with antenatal hydronephrosis (ANH) in order to prevent urinary tract infection (UTI). There are currently no evidence based guidelines in place to support this practice. This systematic review evaluates whether antibiotic (ATB) prophylaxis reduces the rate of urinary tract infections (UTIs) in infants with antenatal hydronephrosis (ANH).

Methods: Four electronic databases and grey literature were searched from 1990-2010. Included studies where children <2 years with ANH receiving either prophylactic ATB or no treatment, number of patients who underwent voiding cystourethrogram was reported and UTI as an outcome. Full-text screening and quality appraisal was performed by 2 independent reviewers with disagreements settled by consensus. Meta-analysis was performed as appropriate, using a random effects model. Heterogeneity was assessed using forest plots and I^2 statistics.

Results: Our search yielded 1681 citations, 21 were included in the final analysis. Total number of infants was 3876. None were randomized control trials (RCTs). 62% of included studies were rated as low or moderate quality. Pooled rates of UTI in low-grade ANH group were similar regardless of ATB status: 2.2% on prophylaxis vs. 2.8% not on prophylaxis ($p=0.5$). In high-grade ANH group, patients on prophylaxis had a significantly lower UTI rate vs. those not on prophylaxis: 14.6% (95%CI 9.3-22.0) vs. 28.9% (95%CI:24.6-33.6), $p<0.01$. Number Needed to Treat (NNT) was 8. 16% of patients had vesico-ureteral reflux (VUR) in the low-grade AHN group compared to 5% in high-grade group. I^2 statistics showed high heterogeneity (85%).

Conclusions: This systematic review suggests that offering ATB prophylaxis to 8 infants with high-grade ANH would prevent 1 UTI, supporting prophylaxis in this sub-group. Presence of VUR does not appear to affect UTI rates. Level of evidence in included studies was low, calling for a RCT.

POD-03.04

Role of a Novel Internet Mediated Feedback Instrument in a New Age of Simulation Training: a Randomized Control Study

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Introduction and Objectives: Simulation for the acquisition of surgical skills is expensive, requires considerable faculty time commitment, and is subject to scheduling conflicts. To circumvent these constraints we investigated the effectiveness of Computer-Based Video Training (CBVT) supported by a novel Internet Mediated Feedback Assessment (IMFA) model.

Methods: This was a 3-arm, randomized transfer design study. Medical students (64) learned knot tying and suturing via a CBVT module. After the 30-minute CBVT based practice all participants performed a pre-test trial consisting of unsupervised knot tying and suturing. The pre-test trial was videotaped and uploaded to a secure server via Observational Practice and Educational Networking (OPEN) Internet site. Participants were randomly assigned to one of the three experimental groups: Control, IMFA-Peer Feedback, or IMFA-Peer and Expert Feedback. All performed a 2-week retention test.

Results: Validated global rating scales showed no significant differences at the initial pre-test between on either the knot tying (p=0.9) or suturing (p=0.8) tasks. Participants in the IMFA-Peer and Expert Feedback group retained more skills than participants in the Control, or IMFA-Peer Feedback groups (suturing, p=0.001; knot tying, p=0.001).

Conclusions: This novel combination of CBVT with Internet supported feedback from peers and experts is the first study to show that teaching surgical tasks over the Internet maybe sub-optimal. This study shows that personalizing practice schedules in accordance with key principles of self-directed learning needs to be supplemented with an expert feedback in order for surgical skills to be optimally retained in the community of learners.

POD-03.05

Solitary Solid Renal Mass: Can We Predict Malignancy?

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Introduction and Objectives: With increased use of imaging, more solid renal masses are found incidentally. Current practice indicates that these masses can be removed without tissue diagnosis. This may lead to increased number of unnecessary surgeries, and associated morbidity. The goal of our study is to determine clinical predictors of benign disease.

Methods: Pathology reports of patients who underwent radical or partial nephrectomy at 2 hospitals from 1998-2008 were reviewed. Only patients with solitary solid unilateral renal masses were included. Predictors of malignancy risk were assessed with univariate and multivariate logistic regression.

Results: 592 patients with a mean age of 60 ± 13 years were included, 38% of whom were women. Radical and partial nephrectomy was performed in 66% and 34% of patients, respectively. Renal masses were equally distributed on right and left sides (49% vs. 51%, p=0.84). Masses were more commonly located in upper and lower poles compared to mid pole (40.8% vs. 38.7% vs. 20.5%, respectively). Mean tumor size was larger in patients who underwent radical compared to partial nephrectomy (6.8 cm vs. 2.9 cm, p<0.001). The rate of benign disease in our overall population was 9.5%. On univariate and multivariate analysis, only renal mass size less than 2 cm and female gender were predictive of benign disease. On further analysis the magnitude of this effect was found to be additive.

Conclusions: Renal masses smaller than 2 cm and female gender were associated with higher probability of benign disease. Patient age and tumor location were not predictive of benign disease.

POD-03.06

A Prospective Randomized Trial of Povidone-iodine Prophylactic Cleansing of the Rectum prior to Transrectal Ultrasound-guided Prostate Biopsy

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Introduction and Objectives: Infectious complications (IC) after transrectal ultrasound-guided prostate biopsy (TRUSBx) include bladder and prostate infections in 3-11% and sepsis in 0.1-5% of patients. This trial investigated the safety and efficacy of Povidone-iodine prophylactic cleansing of the rectum prior to TRUSBx on the rate of IC.

Methods: 1069 men were invited to participate in this trial, of whom 865 met criteria and were randomized prospectively to undergo TRUSBx with (n=421, "treatment") or without (n=444, "control") rectal cleansing. All patients delivered urine and rectal swab cultures prior to TRUSBx and received a 3 day course of ciprofloxacin prophylaxis. Patients measured their temperature for 48 hours after TRUSBx, delivered a urine culture after 48 hours, and completed a telephone interview after 7 days. The primary endpoint was the rate of IC, a composite endpoint consisting of: 1. fever >38.0°C, 2. urinary tract infection (UTI), or, 3. sepsis (standardized definition). Chi- square (X2) significance testing was performed for differences between groups, and a multivariate analysis was performed to assess risk factors for IC.

Results: IC was observed in 11 (2.6%) treated and 20 (4.5%) control patients (p=0.15). Sepsis was observed in 1.0% of treated and 1.6% control patients (p=0.55). Rectal swab cultures revealed ciprofloxacin resistance in 20% of patients, of whom 3.5% developed IC. On multivariate analysis, resistance to ciprofloxacin in the rectal swab culture (p<0.001) and a history of taking ciprofloxacin in the three months preceding TRUSBx (p=0.009) predicted IC. No significant adverse effects to rectal cleansing were observed.

Conclusions: Rectal cleansing with iodine prior to TRUSBx was safe but the 42% relative risk reduction of infections was not statistically significant. Ciprofloxacin-resistant flora were found frequently, but only a small fraction of these patients developed an infectious complication.

Podium Session 4: Lower Urinary Tract
June 25, 2012, 1645-1745

POD-04.01

Mirabegron Improves Patient-reported Outcomes in Patients with Overactive Bladder Syndrome: Results from a North-American Study

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Introduction and Objectives: Patient-reported outcome measures (PROs) of symptom bother, health-related quality of life (HRQoL), treatment satisfaction and disease perception are becoming increasingly important in the assessment of treatments for OAB. Mirabegron is a selective β3-adrenoreceptor agonist in development for the treatment of OAB. Herein we present PROs from a Phase III trial of mirabegron in Canada and the United States.

Methods: This 12wk, multicentre, randomized, double-blind, parallel-group, placebo-controlled, Phase III trial enrolled patients with >3mos of OAB symptoms. During a 2wk, single-blind, placebo run-in period, patients with >8 micturitions/24h and >3 urgency episodes (with or without incontinence) were randomized to receive placebo, mirabegron 50, or 100mg once daily. Co-primary endpoints were changes in the mean number of incontinence episodes/24h and micturitions/24h. Secondary variables included symptom bother, HRQoL, treatment satisfaction and perception of disease were assessed using the Overactive Bladder Questionnaire (OAB-q), Treatment Satisfaction-Visual Analog Scale (TS-VAS) and Patient Perception of Bladder Condition (PPBC).

Results: 1328 patients were randomized and received study drug (placebo n=453; mirabegron 50mg n=442; mirabegron100mg n=433). At 12 wks (or final visit), statistically significant reductions in the number of incontinence episodes and micturitions (co-primary endpoints) with mirabegron 50 and 100mg were also associated with statistically significant improvements in PROs compared with placebo (Table 1).

Conclusions: In this 12wk, North-American study of patients with OAB, mirabegron provided statistically significant improvements both in key OAB symptoms, as well as the PROs for patients perception of disease, treatment satisfaction, symptom bother and HRQoL compared with placebo.

POD-04.02

Greenlight HPS-120W vs. XPS-180W Laser Vaporization of the Prostate for Benign Prostatic Hyperplasia: a Prospective Comparative Outcomes Analysis

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Introduction and Objectives: To evaluate the safety and short-term outcome of the Greenlight XPS 180W laser system in comparison to the HPS-120W system for treating BPH in a prospective non-randomized single-centre study.

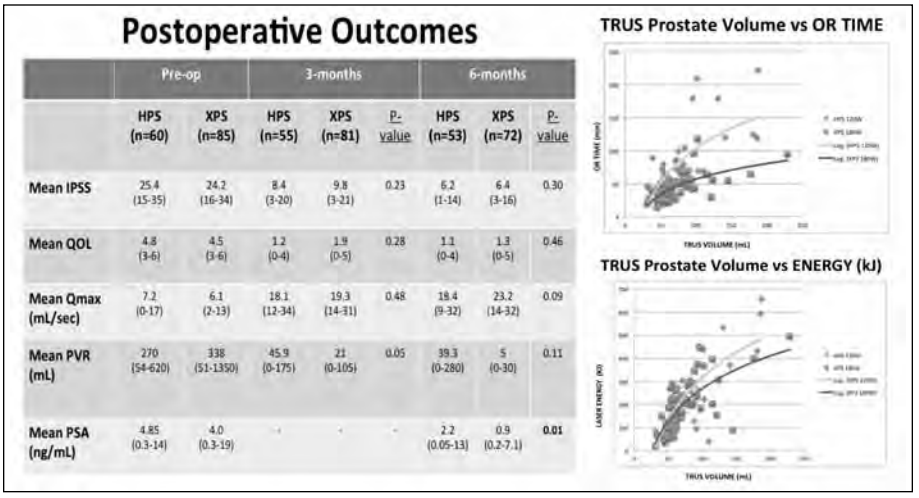
Methods: From June 2010-Sept 2011, 145 consecutive patients were included; 60 patients were treated with HPS-120W and 85 with XPS-180W laser. Perioperative variables and complications were evaluated. IPSS, Qmax, PVR, SHIM and QoIs were recorded at baseline, 1-,3- and 6-months. PSA was assessed at baseline and 6-month.

Results: Mean (range) age of the patients was 69.6 (48-87) years (HPS) and 67.2 (50-85) years (XPS), with a mean preoperative TRUS volume of 81.7 (31-187) and 78.2 (33-229) mL, respectively. Patient preoperative characteristics were comparable including retention rate (52% and 47%, respectively). Mean operative duration was significantly shorter for the XPS group (79 vs. 44.2 min; $p<0.01$) as was mean laser time (37 vs. 24 min; $p<0.01$). Mean energy delivery was however comparable between HPS and XPS groups (222.5 vs. 188.7 KJ; $p=0.12$). Mean fibre use (1.6 vs. 1.0; $p<0.01$) and 3L Saline bags (4.1 vs. 7; $p<0.01$) were significantly lower for the XPS group. The rate of visual impairment from bleeding (3% vs. 4%; $p=0.74$) and prostate capsule perforation (0% in each), were comparable. There were no significant differences in 30-day complication rate including

Table 1. POD-04.01. Adjusted mean* (standard error) change from baseline to final visit

	Placebo	Mirabegron 50 mg	Mirabegron 100 mg
Co-primary endpoints			
Number of incontinence episodes/24h§	-1.13 (0.112)	-1.47† (0.114)	-1.63† (0.117)
Number of micturitions/24h§	-1.05 (0.132)	-1.66† (0.133)	-1.75† (0.135)
Secondary variables: patient-reported outcomes			
Treatment satisfaction (TS-VAS)¥	0.7 (0.16)	1.5‡ (0.16)	2.1‡ (0.16)
Symptom bother (OAB-q)§	-10.8 (0.97)	-17.0‡ (0.98)	-20.2‡ (0.99)
HRQoL score (OAB-q)¥ Total	10.7 (0.89)	14.8‡ (0.90)	17.3‡ (0.90)
Coping	12.8 (1.06)	16.9‡ (1 .07)	19.1‡ (1.08)
Concern	12.7 (1.03)	18.0‡ (1.04)	20.5‡ (1 .05)
Sleep	9.7 (1.07)	14.6‡ (1.08)	17.5‡ (1.09)
Social interaction	6.0 (0.77)	7.4 (0.77)	9.6‡ (0.78)
PPBC§	-0.5 (0.05)	-0.7‡ (0.05)	-0.8‡ (0.05)

*Least squares mean adjusted for baseline, gender and geographical region; $p<0.05$ versus placebo † with or ‡ without multiplicity adjustment; §Negative change indicates improvement; ¥ Positive change indicates improvement.



Postoperative Outcomes

	Pre-op		3-months			6-months		
	HPS (n=60)	XPS (n=85)	HPS (n=55)	XPS (n=81)	P-value	HPS (n=53)	XPS (n=72)	P-value
Mean IPSS	25.4 (15-35)	24.2 (16-34)	8.4 (3-20)	9.8 (3-21)	0.23	6.2 (1-14)	6.4 (3-16)	0.30
Mean QOL	4.8 (3-6)	4.5 (3-6)	1.2 (0-4)	1.9 (0-5)	0.28	1.1 (0-4)	1.3 (0-5)	0.46
Mean Qmax (mL/sec)	7.2 (0-17)	6.1 (2-13)	18.1 (12-34)	19.3 (14-31)	0.48	18.4 (9-32)	23.2 (14-32)	0.09
Mean PVR (mL)	270 (54-620)	338 (51-1350)	45.9 (0-175)	21 (0-105)	0.05	39.3 (0-280)	5 (0-30)	0.11
Mean PSA (ng/mL)	4.85 (0.3-14)	4.0 (0.3-19)	-	-	-	2.2 (0.05-13)	0.9 (0.2-7.1)	**0.01**

Fig. 1. POD-04.02.

dysuria (17% vs. 21%), incontinence (3.3% vs. 3.5%), retention (5% vs. 7%), retrograde ejaculation (65% vs. 60%) or erectile dysfunction (1.6% vs. 2.3%). With a mean follow-up of 11.8 and 7.5 months, no urethral strictures or retreatments were observed. Clinical follow-up is summarized in Fig. 1. 6m-PSA reduction was significantly greater for the XPS group (54% vs. 78%; $p<0.01$).

Conclusions: Both Greenlight systems provide safe and effective tissue vaporization properties with significant clinical relief of BPH obstruction. The XPS-180W laser system appears to be more favorable with regards to reduced operative time, fibre need and PSA-reduction suggesting more effective tissue removal.

POD-04.03

Changes in Erectile Function after Photoselective Vaporization of the Prostate for Benign Prostatic Hyperplasia

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Introduction and Objectives: Although photoselective vaporization of the prostate (PVP) has been shown to improve voiding function in men with benign prostatic hyperplasia (BPH), its effect on erectile function is unknown. The purpose of this study was to characterize changes in erectile function in men undergoing PVP.

Methods: This analysis was conducted on the PVP arm of a non-randomized clinical trial comparing PVP and TURP. All procedures were performed by one surgeon using a 120W GreenLight HPS laser. Subjects completed the Sexual Healthy Inventory for Men (SHIM) and International Prostate Symptom Score (IPSS) prior to surgery and at 6 months post-surgery. Data was collected prospectively and associations between change in SHIM and other clinical variables were tested using the Spearman rank correlation coefficient for continuous variables and the Wilcoxon-Mann-Whitney or Kruskal-Wallis tests for categorical variables. Tests of association were two-sided and performed at a level of significance of .05.

Results: 140 men were included in the analysis. Preoperative SHIM negatively correlated with age (Spearman's r=–0.33, $p<0.001$) but not preoperative IPSS or any other clinical variables. Mean SHIM decreased by 0.9 after PVP, but wide variation was seen, with 39% showing an increase, 16% showing no change and 45% showing a decrease. The only significant predictor of change in SHIM was change in IPSS (Spearman's r=–0.18, $p=0.03$), with men experiencing a greater improvement in voiding symptoms also reporting better postoperative erectile function. There was no significant correlation between change in SHIM and age ($p=0.62$), duration of symptoms ($p=0.31$), preoperative BPH medical therapy ($p=0.96$), PDE5-inhibitor therapy ($p=0.80$) or total energy used ($p=0.55$).

Conclusion: Erectile function outcomes following PVP are variable but correlate positively with the degree of improvement in voiding function. Biologic mechanisms linking erectile and voiding function are poorly understood and deserve further study.

POD-04.04

A Prospective Analysis of Consultation for Difficult Urinary Catheter Insertion at Tertiary Care Centres in Northern Alberta

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Introduction and Objectives: Difficult urinary catheterization is a frequent reason for urologic consultation. Literature regarding difficult urinary catheterization is limited. The objective of the study is to examine the current practice pattern of difficult catheter insertion and to identify strategies that may reduce its incidence and related adverse events.

Methods: This is a prospective observational study of consultation for difficult catheter insertion at tertiary care centres in Edmonton, Alberta between Oct 2010 and Feb 2011. All urologic consultations for difficult catheter insertion in adults at the University of Alberta and Royal Alexandra Hospitals were enrolled. Patients were managed according to the current regional standard of care established prior to the study. A clinical encounter questionnaire (CEQ) was completed by the urology service regarding the details of the consultation and patient factors. CEQ results were tabulated and analyzed for trends, areas of strengths and weakness in the present consultation process.

Results: Eighty-nine patients were accrued to the study. Mean age was 67 years and 91% were male. Seventeen percent of patients had a history of previous difficult catheterization and 65% had a urologic history. Forty-two percent of patients had catheter placement without any auxiliary tools. Adverse events were experienced by 37% of patients including urosepsis, bladder perforation, hydrouterus, paraphimosis and urethral trauma. Thirty-three percent of patients had a significant urethral injury as a result of catheterization attempts. Forty-one percent of consultations were classified as inappropriate and 53% occurred between the hours of 5pm and 6:30am.

Conclusions: Difficult urinary catheterization is associated with significant patient morbidity and may often be preventable. This study highlights the need for implementation of preventative strategies, widespread education and increased awareness regarding catheter care.

POD-04.05

A Novel Urethral Catheter Design for Safer Placement and Outcomes

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Introduction and Objectives: The incidence of iatrogenic urethral injury from urethral catheter balloon inflation is not reported in the literature. Our experience at a high-volume tertiary academic medical centre suggests that this occurs on a regular basis. Most commonly, catheter placement is performed by nurses. Catheter design has not changed in over 30 years. We sought to: (1) Estimate the incidence by assessing the U.S. national incidence of non-infectious catheter related complications; and (2) Create and test a novel catheter design to mitigate urethral trauma caused by inappropriate catheter inflation within the urethra.

Methods: We performed a cross-sectional analysis of the 2006 to 2008 National Inpatient Sample (a 20% stratified sampling of non-federal U.S hospitals), using ICD-9-CM codes. BARD® 16 Fr. catheters were modified by thinning out a circumferential area of the balloon-port shaft, and painting this area red. When the retention balloon is inflated within the urethra, this thinned area ("Safety Balloon") expands, to: (1) Minimize pressure upon the urethra, and (2) Alert the operator. Ink markings were made on the catheter shaft, to indicate to the user to advance the catheter to the hub. We measured pressure within the balloon-port during inflation in the bladder and urethra of fresh human cadavers.

Results: From 2006 to 2008, up to 111,353 patients experienced a non-infectious catheter related complication. Most were male (86.6%) and 46.2% required a procedure, such as cystoscopy or suprapubic tube placement. Balloon-port pressure after inflation within the bladder was similar among standard catheters and our design prototypes (60 kPa ± stedev). The "safety balloon" expanded immediately upon filling within the urethra.

Conclusions: Non-infectious catheter related complications occur regularly. The simple catheter design modifications we describe foster safer placement and may significantly reduce injury from urethral balloon-inflation.

POD-04.06

Urethroplasty for Pelvic Fracture Urethral Distraction Defects (PFUDD): Factors Influencing Surgical Outcome and Erectile Dysfunction

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Introduction and Objectives: PFUDD is a challenging urologic entity. Complications of this injury include urethral stricture, erectile dysfunction (ED) and incontinence. Controversy exists as to the best initial management and factors determining optimal outcome. The purpose of this study is to identify factors that influence ED and successful surgical repair.

Methods: A retrospective database review of 536 urethral reconstructions was performed. Factors examined were cause of pelvic fracture, aligning catheter placement, age, comorbidities, previous intervention, length of defect, infrapubectomy, and time from injury to repair. Primary outcomes were urethral patency and the occurrence of ED.

Results: 49 patients underwent urethroplasty after PFUDD during the study period. Mean age was 40.4 years with average follow-up of 3.3 years. Motor vehicle collision (77%) was the most common etiology. Urethroplasty alone established urethral patency in 85% of patients. Seven patients (14%) developed recurrent stenosis. Almost all of these recurrences (6/7, 86%) were salvaged by a single endoscopic procedure. One patient required repeat urethroplasty. Placement of an aligning catheter at the time of injury did not decrease stricture recurrence (11 vs. 13% p=0.43) but increased the rate of ED (84 vs. 56% p=0.03). A failed attempt at aligning catheter placement substantially increased the risk of ED (91 vs. 56% p=0.04) but did not decrease stricture recurrence (27 vs. 13% p=0.17).

Conclusions: PFUDD injuries are amenable to repair by a single urethroplasty in 85% of cases. The majority of recurrences (86%) can be treated with a single endoscopic technique. Overall urethral patency after these injuries is 98%. Placement of aligning catheter at time of injury increases the rate of ED without improving operative outcome. There is evidence that a failed attempt at urethral realignment (likely reflecting severity of injury) highly predicts the occurrence of ED.

Podium Session 5: Prostate Cancer
June 26, 2012, 0800-0900

POD-05.01

Effect of Denosumab on Prolonging Bone-metastasis Free Survival in Men with Non-metastatic Castrate-resistant Prostate Cancer Presenting with Aggressive Prostate-specific Antigen Kinetics

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Introduction & Objectives: Denosumab, an anti-RANK-ligand monoclonal antibody, has been shown to prolong bone-metastasis free survival (BMFS) by a median 4.2 months and with a 15% risk reduction vs. placebo in men with non-metastatic castrate-resistant prostate cancer (CRPC) and baseline prostate-specific antigen (PSA) value ≥8.0 ng/mL and/or PSA doubling time (DT) ≤10.0 months. The objective of this analysis was to determine the efficacy of denosumab in men at greatest risk for bone metastases. BMFS was evaluated in a subset of men with PSADT ≤6 months (previous report in Smith MR, et al: J Clin Oncol. 23:2918-2925, 2005).

Methods: 1432 men with non-metastatic CRPC (baseline [median] PSA: 12.3 ng/mL, PSADT: 5.1 months, ADT duration: 47.1 months) were randomized 1:1 to receive monthly subcutaneous denosumab 120 mg or placebo. The first patient enrolled February 2006; primary analysis cut-off was July 2010, when >660 men had developed bone metastasis or died. The primary endpoint was BMFS (time to first bone metastasis or death from any cause). BMFS results are presented for men with baseline PSADT ≤6 months.

Results: Median BMFS in the placebo group of men with PSADT ≤6 months was 6.5 months shorter than for the placebo group in the full population (18.7 months vs. 25.2 months), indicating that these men are at particularly high risk. In this group of men with PSADT <6 months, denosumab prolonged BMFS by a median of 7.2 months and with a 23% reduction in risk compared with placebo (Table 1).

Conclusions: Patients with shortened PSADT are at higher risk of developing bone metastasis and denosumab is markedly effective at prolonging BMFS in this subset of patients.

POD-05.02

Need for Intervention and Survival in a Cohort of Patients on Active Surveillance (AS) for Low-risk Prostate Cancer

Preston, Mark A.[1]; Paly, Jonathan J.[1]; Carrasquillo, Robert[2]; Coen, John J.[1]; Zietman, Anthony I.[1]; Smith, Matthew R.[1]; Wu, Chin-Lee[1]; McDougal, W. Scott[1]; Feldman, Adam S.[1]
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Introduction and Objective: Specific indications for intervention and survival in patients on AS have not been adequately defined. With the growing concern about overtreatment of prostate cancer, AS is increasingly used to manage low risk prostate cancer. However, longterm data on need for intervention and survival is limited. Our objective was to determine the need for intervention, CSS and OS in an AS cohort.

Methods: A historical cohort study of 499 men diagnosed with localized prostate cancer was performed at a single centre between 1997-2009. Although AS had been practiced during this period, in 2008 our group agreed upon inclusion criteria for AS: Gleason 6, Gleason 7 in select patients with low volume, ≤3/12 cores positive with ≤20% in each core, and PSA<10. Only men with AS as initial management were included. Survival analyses were conducted using the Kaplan-Meier method.

Results: Median age at diagnosis was 68.3yr and median fu was 4.8yr. Median PSA at diagnosis was 5.1. 98.2% (490/499) of patients were Gleason 6, 1.8% (9/499) were Gleason 7 and 94.0% (469/499) were stage T1c. Freedom from intervention was 77% at 5yr and 63% at 10yr. Of the 123 patients requiring treatment, 57 (46%) received radiation, 29 (24%) received surgery, 17 (14%) received brachytherapy and 20 (16%) received hormonal therapy. Reasons for intervention included; 46% (56/123) path progression, 29% (36/123) PSA progression, 12% (15/123) patient preference, and 6% (7/123) DRE progression. Metastases-free survival was 99% at 5yr and 97% at 10yr. Freedom from salvage ADT was 99% at 5yr and 91% at 10yr. CSS was 100% at 5 and 10yr. OS was 96% at 5yr and 86% at 10yr.

Conclusions: 63% of patients remained on AS at 10yr. In those treated, pathologic, PSA or DRE progression initiated treatment in 81%. AS is a treatment method which spares the majority of properly selected men from intervention, provides adequate time for intervention if required, and has durable CSS and OS.

POD-05.03

A Population-based Analysis of Pathological Outcomes Following Radical Prostatectomy in Academic vs. Non-academic Institutions

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University of Manitoba, Winnipeg, MB, Canada

Table 1. POD-05.01

Population	Sample Size	BMFS Median (Months)	BMFS Treatment Difference (Months)	Hazard Ratio	95% Confidence Interval	*p*-value
All Patients	D: 716 P: 716	D: 29.5 P: 25.2	4.2	0.85	0.73–0.98	0.028
PSADT <6 months	D: 419 P: 427	D: 25.9 P: 18.7	7.2	0.77	0.64–0.93	0.0064

D=Denosumab; P=Placebo.

Introduction and Objectives: Radical prostatectomy (RP) is a common urological procedure in the treatment of prostate cancer (PCa). With increasing sub-specialization within tertiary care hospitals, RP outcomes may be superior in academic rather than at nonacademic institutions.[1] We report on pathological outcomes between academic and non-academic institutions.
Methods: Retrospective chart review of 1080 men diagnosed with PCa between 2003 - 2008 who were treated with RP. Pathological outcomes were compared between oncology fellowship trained academic (FTA) vs. non-fellowship trained academic (NFTA) vs. non-academic (NA) urologists. Multi-variable logistic regression analysis was used to adjust for confounding variables and included the following factors: age at prostatectomy, urologist type (FTA, NFTA, NA), Gleason sum, nodal status, ratio of positive to total cores at biopsy, lymphovascular invasion and pathological stage. Surgeon intensity, defined as the average number of cases per year, was also examined
Results: Overall margin positivity was 49.4%. The rate of positive margins was different between FTA, NFTA and NA urologists (p=0.0003). Pathological stage and the ratio of positive core biopsies were also associated with margin positivity (p= 0.0042 and p=0.0056, respectively). NFTA and NA urologists were more likely to have positive margins compared to FTA urologists (OR 2.429; 95% CI: 1.355 - 4.355 and OR 2.219; 95% CI: 1.564 - 3.149, respectively). However, the rate positive margins between NFTA and NA urologists was not significant (OR = 1.09; 95% CI 0.6385 - 1.8764, p=0.7425).
Conclusions: Increased sub-specialization within tertiary centres correlates with reduced rates of margin positivity. The outcomes of margin positivity in our cohort will require further investigation to discern oncological impact.

POD-05.04

Between-surgeon Variation in Outcomes of Radical Prostatectomy for Clinically Localized Prostate Cancer: Analysis of 1014 Consecutive Men Treated at the University of Alberta

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Introduction and Objectives: We determined whether between-surgeon variation (known as heterogeneity) in outcomes of radical prostatectomy exists for urologic surgeons practicing at a Canadian academic centre.
Methods: A prospective analysis of data from the University of Alberta Radical Prostatectomy Database was performed. Between September 2007 and August 2010, 1019 consecutive men underwent radical prostatectomy for clinically localized prostate cancer by 1 of 8 urologic surgeons. All patients followed a common postoperative clinical care pathway. The outcomes were biochemical recurrence (BCR), positive surgical margins (PSM), and complications within 90 days of surgery. BCR was defined as a PSA ≥ 0.1 ng/ml followed by a subsequent confirmatory value or initiation of salvage therapy. Complications were analyzed and graded according to the Clavien system. Multivariable random effects models were used to evaluate heterogeneity in outcomes after adjustment for case mix.
Results: Data were evaluable for 1014 out of 1019 patients. The median follow-up duration was 21 months (IQR 12 to 29). There was no significant between-surgeon variation in BCR (random effects variance <0.001, p=0.99). However, there was significant between-surgeon variation in PSM (random effects variance=0.049, p=0.03) and complications within 90 days of surgery (random effects variance=0.148, p<0.001). Two surgeons had adjusted PSM rates ≤21% whereas four surgeons had adjusted PSM rates ≥30%. Three surgeons had adjusted 90-day complication rates ≤23% whereas three surgeons had adjusted 90-day complication rates ≥39%.
Conclusions: A patient's likelihood of achieving optimal cancer control and perioperative outcomes differs depending on which of two urologic surgeons performs his radical prostatectomy. Research examining the mechanism(s) underlying surgical heterogeneity in outcomes of radical prostatectomy is urgently needed.

POD-05.05

Population-based Study of Long-term Rates of Surgery for Urinary Incontinence following Radical Prostatectomy for Prostate Cancer

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Introduction and Objectives: Urinary incontinence can be a significant complication of radical prostatectomy, and can be treated with post-prostatectomy surgical procedures. The long-term rates of patients undergoing these surgeries, which include the insertion of an artificial urinary sphincter (AUS) or a urethral sling, have not been well-described. We examined the long-term rates of post-prostatectomy incontinence surgery and factors that influences the rates.
Methods: We conducted a population-based study of 25,346 men who underwent radical prostatectomy for prostate cancer in Ontario, Canada, between 1993-2006. We used hospital and cancer registry administrative data to identify patients from this cohort who later underwent surgery for urinary incontinence.
Results: Of the 25,346 patients, 703 (2.8%) underwent an insertion of an AUS and 282 (1.1%) underwent a urethral sling procedure, a mean of 3.9 years after the prostatectomy. The probability of patients undergoing an AUS/sling procedure increased over time from prostatectomy. The 5, 10 and 15-year Kaplan-Meier rates of undergoing an AUS/sling procedure were 2.6% (95%CI:2.4%-2.8%), 3.8% (95%CI:3.6%-4.1%), and 4.8% (95%CI:4.4%-5.3%), respectively. Factors that were predictive of surgery for incontinence were age at radical prostatectomy (HR=1.24 per decade, 95%CI=1.11-1.38, p=0.0002), radiotherapy after surgery (HR=1.61, 95%CI=1.36-1.90, p<0.0001) and surgeon volume (performance of ≥49 prostatectomies per year) (HR=0.59, 95%CI=0.46-0.77, p<0.0001).
Conclusions: Five percent of patients who undergo a radical prostatectomy are expected to undergo surgery for urinary incontinence over a 15 year period. Increasing patient age, radiation treatment, and low surgeon volume are all associated with significantly higher risk.

POD-05.06

A Randomized Trial Comparing External Beam Radiation and Cryotherapy in Localized Prostate Cancer: 10 Year Follow-up

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Introduction and Objectives: Localized prostate cancer can be treated using various modalities, but head-to-head comparisons of treatments are infrequent. We conducted a randomized unblinded, non-inferiority trial to compare cryoablation and external beam radiation therapy in treating localized disease.
Methods: From December 1997 through February 2003, 244 men with newly diagnosed localized prostate cancer were randomly assigned to cryoablation or radiotherapy (122 to each arm). All patients received neoadjuvant antiandrogen therapy. The revised primary endpoint was disease progression at 36 months based on: (a) radiological evidence of metastatic disease or b) initiation of further antineoplastic therapy or c) biochemical failure defined as a rise of PSA above nadir + 2. Secondary endpoints were overall survival, disease-specific survival, and prostate biopsy at 36 months.
Results: Median follow-up is 119 months. Overall and disease specific survival is the same in both groups. Disease progression at 120 months was: 37% in the cryoablation arm and 46% in the radiation therapy arm (difference = 9%, N.S: PSA >1.0 ng/ml); At 36 months biopsy more radiotherapy patients had a cancer positive biopsy (28.9%) compared with cryoablation patients (7.7%). Adverse events (grade 3) occurred in 10.3% of cryotherapy and 12.3% of radiation patients.
Conclusions: At 10 years follow-up, there continues to be no significant difference between the two treatment modalities. While significantly fewer positive biopsies were documented following cryoablation than radiotherapy, this has not resulted in a higher prostate cancer specific mortality. Prostate cancer specific mortality is similar to other prospective randomized trials in the management of localized prostate cancer.

Moderated Posters 1: Prostate Cancer
June 26, 2012, 1240-1440

MP-01.01
The Impact of a Sensitivity Adapted Antimicrobial Prophylactic Strategy on Prostate Biopsy Sepsis

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Introduction and Objectives: Infections following prostate biopsy can be associated with significant morbidity and occasional mortality. Studies have suggested an increased incidence in post-biopsy sepsis. The purpose of this study was to determine the effect of a bacteria sensitivity adapted antimicrobial prophylactic strategy on the incidence of sepsis post prostate biopsy.
Methods: In October 2008, based on the prevalence of ciprofloxacin-resistant E.coli in the region, our institution modified the prophylactic regimen for prostate biopsy from oral ciprofloxacin alone to a combination of single-dose ciprofloxacin and trimethoprim/sulfamethoxazole. If patients had a history of urosepsis, bacterial prostatitis, organ transplant, or fluoroquinolone use in the preceding 12 months, intramuscular ceftriaxone was administered for prophylaxis. Patients with penicillin allergy received gentamicin. We determined the incidence of ciprofloxacin-resistant bacteremia 15 months before and 15 months after the change in antibiotic protocol.
Results: Between June 2007 and September 2008, 9 of 847 (1.06%) patients were admitted with prostate biopsy induced bacteremia secondary to ciprofloxacin-resistant E. coli. In the 15 months following introduction of the described prophylactic regimen, 1 of 989 (0.10%) patients suffered ciprofloxacin-resistant sepsis. The absolute reduction in E. coli sepsis was 0.96% (95%CI 0.2% to 1.7%; p=0.007). The number needed to treat is 104.
Conclusions: Bacterial susceptibility to antimicrobial agents is in evolution. Using a regional bacteria sensitivity based approach to biopsy prophylaxis, we have significantly decreased ciprofloxacin-resistant E. coli sepsis in our patients. Regional bacteria sensitivity based protocols may decrease the incidence at other centres and warrants further study.

MP-01.02
Serum Adipokine Levels Improve Prostate Cancer Prediction Compared to Clinical Data Only

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Introduction and Objectives: Previously we demonstrated the potential of adipokines as biomarkers for prostate cancer. However biomarkers are costly and should be used if they prove superior to existing models using clinical data. In this study we sought to determine whether adipokines offer additional diagnostic benefit in comparison to clinical data.
Methods: The analysis included data from 200 patients undergoing prostate biopsy (One-hundred PCa cases and 100 controls). Serum samples collected prior to prostate biopsy were used to measure adipokines (adiponectin, leptin, PAI, Resistin, HGF, IL-1β, IL-6, IL-8, MCP-1, NGF and TNF-alpha) using Milliplex Multi-Analyte Profiling kits. Multivariable models for predicting PCa and high grade PCa were created using predictors from three model selection methods (Forward, Backward, Stepwise) based on 1000 bootstrap samples. We compared a model composed of clinical data to one that includes both clinical data and adipokines. The ability of each model to predict PCa was evaluated by area under the receiver operating characteristic curve (AUC of ROC).
Results: The multivariable clinical model to predict PCa included: DRE, BMI, previous biopsy and PSA. The adipokine multivariable model included the clinical variables MCP-1, TNF-alpha , IL-6 and HGF. The AUC of the ROC curve for predicting PCa was 0.67 (95%CI 0.59-0.74) for the clinical data only vs. 0.745 (95%CI 0.67-0.81) for the model including adipokines (p=0.018). The clinical model to predict high grade PCa included: DRE, PSA and previous biopsy. The adipokines added to predict high grade cancers were: NGF and MCP-1. The AUC of the ROC curve for predicting high grade prostate cancer was 0.75 (95%CI 0.67-0.83) for the clinical data only vs. 0.79 (95%CI 0.71-0.86) for the model including adipokines (p=0.0532).
Conclusions: We have demonstrated that adding serum adipokine levels increases the accuracy of models predicting both prostate cancer and high grade prostate cancer.

MP-01.03
PCA3 Test as an Adjunct in Diagnosis of Prostate Cancer

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Introduction and Objectives: Early diagnosis of prostate cancer is conventionally done with serum prostate specific antigen (PSA) test and digital rectal examination, but these tests lack specificity. Many men worldwide undergo repeated, sometimes unnecessary prostate biopsies due to suspicious or rising PSA levels. In this multinational study we assessed the performance of the PCA3 urine test in patients who were candidates for prostate biopsies due to high or rising PSAs.
Methods: The PCA3 scores were determined in urine samples in these men. A PCA3 scores of 35 or higher were considered higher probability of cancer. Subsequent biopsy was performed as per current best practice and at the discretion of the urologist in concert with the patient. We used multiple logistic regression analysis and ROC curves to evaluate PCA3 as a prognostic factor compared with PSA and evaluated the influence of PCA3 testing on the decision making.
Results: In 256 patients (63.8%) the indication was rising or high PSA after previous negative biopsies, finding of HGPIN or ASAP on previous biopsy – in 101 patients (25.2%). PCA3 scores were significantly lower in patients without malignancy using a cutoff score of 35 (OR 2.99 (95%CI), p=0.004). On ROC analysis PCA3 AUC of 0.722 was significantly greater than PSA (0.4837). Sensitivity and specificity of PCA3 score using the 35 cutoff were 63.6% and 63.0%, respectively. The PCA3 test affected the patient's management in 73.5% of cases. The follow-up PSA values in patients who did not perform biopsy after PCA3 testing had, without exception, remained stable or dropped with follow-up of at least 6 months.
Conclusions: In this multinational study we demonstrate that urine PCA3 score test out-performs PSA in decision making in men facing possibility of repeat prostate biopsy. We recommend that the PCA3 score should be integrated with other relevant data and rather be used in continuous fashion, and not with certain cutoff value.

MP-01.04

Percentage of Gleason 4 on Repeat Biopsy: How Much Matters?

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Introduction and Objectives: A common trigger for intervention in men on active surveillance (AS) is an upgrade to Gleason 4 disease on repeat biopsy. However, it is unknown what percentage of Gleason 4 portends worse outcomes at the time of surgery. Our objective was to investigate the relationship between percentage of Gleason 4 on repeat biopsy and pathological stage at surgery.

Methods: This was a retrospective review of AS patients who had low grade and volume of disease at diagnosis,underwent at least 1 repeat biopsy, and ultimately went on to radical prostatectomy. We reported the distribution of patients who had no, <30% and ≥30% Gleason 4 on repeat biopsy. Multivariate logistic regression was used to assess the association between percent of high-grade disease (Gleason 4) on repeat biopsy and the likelihood of pathological ≥T3 disease at surgery.

Results: The cohort consisted of 85 patients. The mean age was 60 (6.7) and the median number of biopsies per patient was 2 (2-9). Among these patients, 32 (38%) had no grade progression, 21 (25%) had <30% Gleason 4 and 31 (36%) had ≥30% Gleason 4 on repeat biopsy. Percentage of high-grade biopsy tissue was associated with higher risk of upstaging in univariate and multivariate analysis. Men with ≥30% Gleason 4 on repeat biopsy were more likely to have pathological T3 disease compared to men that did not have grade progression (OR 9.2, 95%CI 1.7-48.9; $p<0.01$). However, there was no difference in the likelihood of pathological ≥T3 disease between those patients without grade progression and those with upgrade to <30% Gleason 4 ($p=0.87$).

Conclusions: This analysis showed that the percentage of Gleason 4 on repeat biopsy was associated with the likelihood of extra-prostatic disease at surgery and thus, should be an important factor when making treatment decisions.

MP-01.05

Diagnostic Accuracy of Seminal Vesicle Biopsy in Evaluating Seminal Vesicle Invasion: Comparison with MRI

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Introduction and Objectives: No consensus exists regarding role of seminal biopsy for patients in whom staging MRI suggests seminal vesicle invasion MRI has a high false positive rate for seminal vesicle invasion. Our aim was to retrospectively determine the accuracy of seminal vesicle biopsy in diagnosing seminal vesicle involvement in carcinoma of prostate, as compared to magnetic resonance (MR) imaging and to correlate to radical prostatectomy specimen histology.

Methods: Retrospective review of MRI findings along with radical prostatectomy specimen of patients who underwent seminal vesicle biopsy as a diagnostic tool. Data were collected on all patients who underwent seminal vesicle biopsy (period: 2002-2010). Forty-one men (age range: 48-79 years). The histology was reviewed individually and correlated with pre-biopsy MRI and post biopsy prostatectomy if surgery performed.

Results: MRI: Thirty-one (76%) cases had suspicious to positive MRI findings for seminal vesicle involvement and 10 (24%) had –ve results. SV: Of all the 41 patients who underwent SV biopsy, 30(73%) were –ve, 6 (15%) were suboptimal, 5 (12%) were +ve and they did not undergo radical surgery. Out of all negative SV biopsy patients: Nine (22%) underwent radical robotic prostatectomy. All the nine surgical specimens showed no seminal vesicle involvement however All the nine patients had a suspicious to +ve on MRI prostate. All those underwent SV biopsy did not have any significant post operative complications.

Conclusions: Seminal vesicle biopsy appears to have higher diagnostic accuracy when compare to MRI in diagnosing seminal vesicle invasion by carcinoma of prostate. Patients with positive to suspicious MRI will benefit from SV biopsy before deciding about surgery.

MP-01.06

Ultra-extended Prostate Biopsy Improves Detection of Pathologic Progression in Patients on Active Surveillance for Prostate Cancer

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Introduction and Objectives: Active surveillance (AS) involves regular prostate re-biopsy to minimize sampling error and detect pathological progression. At our institution, re-biopsy consists of an "ultra-extended" template (UET) of 15-17 cores. We investigated if biopsy templates with fewer cores could be used with similar rates of detecting cancer and pathological progression.

Methods: We identified patients in our single institution prospectively maintained database with an entry PSA <10, Gleason sum (GS) ≤6, stage T1c, ≤3 cores positive for cancer, <50% of single core involved and age ≤75 years (N=272). From this group, 94 patients fulfilled the standard criteria for pathological progression at any follow-up biopsy and were selected for evaluation. By mapping tumor location on the pathological progression determining biopsy, we were able to apply hypothetical scenarios of sextant or standard extended templates to establish if these biopsy templates were equivalent in detecting pathological progression.

Results: For the 94 patients analyzed, the median number of cores taken at baseline was 9.7 (6-22) and 15.1 (6-27), for follow-up biopsies. The median time between baseline and the pathological progression determining biopsy was 15.4 months (8.9-27.8). Patients pathologically progressed with one (56.4%), two (28.7%) and all three criteria (14.9%) respectively. If a sextant template had been used, 84% of the cancers and 47.9% of the progressive events would have been identified. A standard extended template scenario detected 99% of cancers and 81.9% of patients that pathological progressed. When considering GS ≥7 related progression events, standard extended template found 60.6% compared to UET, 72.3%.

Conclusions: When following patients on AS, a 15-17 core UET detects pathologically significant cancer in 20-50% more patients than standard sextant or extended biopsy templates. Better predictors for tailoring biopsy templates are required.

MP-01.07

Is There a Role for Routine Anterior Zone Sampling during Transrectal Ultrasound Guided Saturation Prostate Biopsy

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Introduction and Objectives: The anterior zone (AZ) of the prostate has been recognized as a sanctuary site for prostate cancer (PC). We examined the diagnostic yield of AZ biopsies as part of a saturation template in patients with elevated PSA levels but with previous negative extended prostate biopsies (group 1), and in surveillance biopsies of PC patients (group 2).

Methods: 95 patients (66 group 1 and 29 group 2) underwent TRUS-guided saturation biopsy under local (n=83) or spinal (n=12) anesthesia: 16 cores were taken from the peripheral zone (PZ), 4-6 cores from the transitional zone (TZ), and 4-8 cores from the AZ. All suspicious ultrasonic areas were targeted to a median of 26 cores. All biopsies were completed by a single urologist and reviewed by a specialized uro-pathologist.

Results: The overall diagnostic yield was 33% (group1) and 93% (group 2). AZ cancers were detected in 18% (group 1) and 38% (group 2) ($p=0.018$) but were rarely the only site involved (3%). Findings in the AZ changed the risk stratification of the disease in only 4.5% of patients in group 1 and 10% of group 2 ($p=0.36$). The two groups were similar with respect

to age and PSA. There was an equal incidence of ≥ Gleason 7 disease in the AZ in both groups, however, this was often accompanied by disease of equal grade in the PZ. Isolated TZ cancers were not detected. 28.6% and 25.9% of patients with positive biopsies in groups 1 and 2 met the Epstein Criteria for insignificant PC. Overall 15/29 (52%) of patients in the AS group showed some progression in disease on their surveillance biopsy (8 with increased disease volume, 7 with upstaging to Gleason 7).
Conclusions: Saturation biopsy is almost always positive in patients undergoing surveillance biopsy and commonly positive in patients with clinical suspicion for PC despite previous negative biopsies. However, the routine addition of TZ and AZ sampling rarely adds to the diagnostic yield, and will seldom change a patient's risk stratification.

MP-01.08

International Multi-centre Study Examining Selection Criteria for Active Surveillance in Men Undergoing Radical Prostatectomy

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Introduction and Objectives: To examine the proportion of pathological re-classification for men who were initially suitable for active surveillance (AS), that underwent radical prostatectomy.
Methods: From three centres in UK, Canada and Australia, prospective data on men who underwent radical prostatectomy was retrospectively reviewed. Men initially suitable for AS, according to Toronto (1) and PRIAS (2) criteria, had prostatectomy specimens analyzed for pathological upgrading (Gleason score ≥7) and upstaging (≥pT3 disease). Multivariable logistic regression was performed to identify predictors of high-risk disease. A nomogram was generated by logistic regression analysis, and performance characterized by ROC curves.
Results: The number of men meeting the Toronto and PRIAS criteria was 800 and 410 respectively. For Toronto and PRIAS groups, the rates for upgrading were 50.6%, 42.7%, and upstaging 17.6%, 12.4% respectively. Significant predictors of high-risk disease were: - Toronto criteria: increasing age, cT2 disease, centre of diagnosis and number of positive cores - PRIAS criteria: increasing PSA and cT2 disease Cambridge had a high pT3a rate (26% vs. 12%). To assist selection of men in the UK for AS, from the Cambridge data, we generated a nomogram predicting high-risk features in patients who meet the Toronto criteria (AUC of 0.72).
Conclusions: The rate of pathological re-classification in our cohort was higher than previously reported from Europe and America. Care must be used when applying AS criteria generated from one population to another. With more stringent selection criteria, there is less reclassification but also fewer men who may benefit from AS.

MP-01.09

Gleason Upgrading and Increased Cancer Volume on Repeat Prostate Biopsy in Patients on Active Surveillance (AS)

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Introduction and Objectives: The choice to terminate AS for localized prostate cancer in favor of initiating definitive treatment is based on factors including pathologic change on re-biopsy, progression in PSA or DRE, or patient preference. The relative extent to which each of these factors plays a role in the termination of AS is not clearly established. Our objective was to determine the prevalence of prostate re-biopsy and subsequent pathologic change in an AS cohort.
Methods: Under IRB approved protocol, a historical cohort study of men diagnosed with prostate cancer was performed at a single centre between 1997 and October 2009. Although AS had been practiced throughout this period, in 2008 our group agreed upon a protocol for repeat biopsy at 12-18 months after diagnosis. Subsequent biopsy was left to the discretion of the treating physician. Only men with AS as the initial management option were included.
Results: The median fu was 4.8yr for the 499 patients included in the study. Median PSA at diagnosis was 5.1. 98.2% (490/499) of patients were Gleason 6, 1.8% (9/499) were Gleason 7 and 94.0% (469/499) were stage T1c. 322/499 (65%) patients underwent rebiopsy. The number of rebiopsies ranged from 1–5 with 113/499 (23%) patients having more than one rebiopsy. Findings on initial rebiopsy revealed prostate cancer in 71% (228/322), benign tissue in 21% (67/322), PIN in 7% (23/322), and atypia in 1% (4/322). The Gleason sum increased in 19% of patients whose rebiopsy revealed cancer. Cancer volume increased (expressed as percent of positive cores in quartiles) in 26% of patients on rebiopsy. Of 123 patients who required active treatment, 46% (56/123) was due to pathologic progression.
Conclusions: We identified a significant proportion of Gleason upgrading and volume progression on repeat biopsy in this cohort. Repeat biopsy often resulted in a significant change in management. These findings support the critical role of repeat biopsy in an AS protocol.

MP-01.10

Multi-institutional Validation of the CAPRA-S Score to Predict Outcomes after Radical Prostatectomy

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Introduction: The UCSF Cancer of the Prostate Risk Assessment post-Surgical (CAPRA-S) score uses postoperative pathological data to predict the risk of PSA recurrence post radical prostatectomy. The study objective was to validate this instrument's performance in a large, multi-institutional, external database.
Methods: Of the 2,892 men in the Shared Equal Access Regional Cancer Hospital (SEARCH) database, 2,670 (92%) had complete data available to calculate a CAPRA-S score. The CAPRA-S is determined by adding up to 3 points each for PSA and pathological Gleason score, 2 points each for positive surgical margins and seminal vesicle invasion and 1 point each for extracapsular extension and lymph node involvement. Performance of the CAPRA-S score was assessed using proportional hazards regression, and compared to a validated postoperative nomogram by the concordance (c) index, calibration plots and decision curves analysis.
Results: Among this cohort, the mean age was 62 (SD 6.3) years and 33.3% of men recurred. Median follow-up was 61 months among men who did not recur. The hazard ratio (HR) for each one-point increase in the CAPRA-S score was 1.39 (95%CI 1.36-1.43). The 5-year progression free probability for those patients with a CAPRA-S score of 0-2, 3-5 and 6-10 (defining low-, intermediate-, and high-risk) were 72%, 39%, and 17%, respectively. The CAPRA-S c-index was 0.75 in this validation set, compared to a c-index of 0.73 for the Stephenson nomogram and 0.77 for CAPRA-S in the original development set. The CAPRA-S score performed better than the Stephenson nomogram on both calibration plots and decision curves analysis.
Conclusions: In this external validation study, the CAPRA-S score accurately predicted recurrence after radical prostatectomy. The score is an effective prognostic tool with potential broad applicability in the clinical and research settings.

MP-01.11

High Intensity Focused Ultrasound for Localized Prostate Cancer: Impact of Nadir PSA on Cancer Control

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Introduction and Objectives: High intensity focused ultrasound (HIFU) is a treatment for clinically localized prostate cancer. The aim of this study is to assess the impact of PSA nadir on biochemical failure free rate (BFFR) in a large single centre cohort.

Methods: We analyzed our institutional review board approved prospectively collected database of consecutive patients who underwent primary HIFU (Ablatherm, EDAP, Lyon) for prostate cancer. Patients were included in the study if they were stratified by the D'Amico criteria as either low- or intermediate-risk with at least 12 months follow-up. Patients with prior radiotherapy or HIFU were excluded. PSA nadir was defined as the lowest value of post treatment PSA at any time during follow-up. Biochemical failure (BCF) was defined by the Stuttgart method (nadir+1.2 ng/mL). Kaplan-meier survival curves for BFFR over time stratified by PSA nadir ≤0.5 ng/ml and >0.5 ng/ml were compared using the log-rank test. Univariable and multivariable Cox regression analysis was performed.

Results: Between May 2005 and December 2010, 402 patients met the inclusion criteria for the study. Median follow-up was 24 months, median nadir PSA was 0.1 ng/mL, median time to nadir PSA was 3 months, and BCF was observed in 81 patients. BFFR at 48 months follow-up was 79% (72-86, 95%CI) for a PSA nadir ≤0.5 ng/mL and 25% (13-38, 95%CI) for PSA nadir >0.5 ng/mL (log-rank p<0.001). PSA nadir >0.5 ng/mL (HR 7.69, 95%CI 4.93 – 12.0), prostate volume and pretreatment PSA were significant predictors of BCF on univariate Cox analysis (p<0.05). PSA nadir >0.5 ng/mL (HR 6.88, 95%CI 4.39-10.77) and pretreatment PSA (HR 1.11, 95%CI 1.05 – 1.18) were found to predict BCF on multivariable Cox analysis.

Conclusions: Nadir PSA following primary HIFU serves as a highly significant predictor of BCF. Given that nadir PSA is achieved at a median time of 3 months, this variable can be used as an early trigger for post-treatment biopsy.

MP-01.12

Radical Prostatectomy in Patients with High-Risk Prostate Cancer: Predicting Oncological Outcomes in a Single Series

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Introduction and Objectives: The role of radical prostatectomy (RP) in patients (pts) with high risk disease is controversial. Objectives of this study were to report our experience in terms of oncological outcomes and to analyze the risk factors for disease progression in a select group of patients who underwent RP, with or without adjunctive therapies.

Methods: We retrospectively reviewed the records of 209 consecutive pts with high risk PCa having one or more of the following risk factors: PSA ≥20,cT3, Gleason 8-10, underwent RP and bilateral pelvic lymphadenectomy between 2000 to 2010. Pathologically confined disease (PCD) was defined as negative surgical margins, pT2-pT3a, and negative lymph node involvement. The Kaplan Meier method was used to assess biochemical recurrence (BCR)-free survival and cancer-specific survival (CSS) rates. Potential predictors were explored using univariable and multi-variable Cox regression models.

Results: Patient and tumor characteristics are listed in Table 1. Of 209 pts, 126 (60%) had PCD and 83(40%) extraprostatic disease. 160 (77%) pts had one high risk feature, 17% of pts had 2 and 7% had 3 features. Mean pre-PSA was 12.54 (range 2.23-36) ng/ml. Median follow-up was 55 (8-109) months. At multivariable analysis: cT3 (p=0.022), biopsy Gleason score (p=0.004) and pre-PSA (p=0.001) were all predictive factors of progression of disease but the percentage of tumor involvement was not a predictor (p=0.657). At 5 years, overall BCR-free survival was 56% and CSS was 92%. 104 (50%) pts had androgen deprivation therapy postoperative, 35 (17%) had adjuvant radiotherapy and 70 (33%) received combined therapy.

Table 1. MP-01.12

Parameters	Population=209 (100%)
Age	63.27±6.94
BMI Kg/m²	25.99±2.87
PSA ng/mll	
<10	80(38)
10-20	83(40)
21-50	46(22)
Clinical Stage	
cT1	40(19)
cT2	85(41)
cT3	84(40)
B.Gleason	
≤6	44(21)
7	73(35)
≥8	92(44)
Pathological Stage	
pT2	42(20)
pT3a	121(58)
pT3b	46(22)
pT4	-
Pathological Gleason	
≤6	32(15)
7	114(54)
≥8	63(31)

Note: Number (%); Mean±standard deviation.

Conclusions: In our series, 60% of pts presented with organ-confined disease. At intermediate term, the results showed acceptable cancer control and CSS. Radical prostatectomy has a role in a select group of patients with high-risk disease, with adjuvant therapy recommended for those with risk factors for disease progression.

MP-01.13

Prospective, Randomized Use of the VLOC Vesicourethral Anastamosis during Robot-assisted Radical Prostatectomy: Long-term Follow-up

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Introduction and Objectives: Robotic vesicourethral anastomosis (VUA) using the Van Velthoven technique has significantly improved urinary reconstruction during RARP. Recent series suggest off-label use of barbed polyglyconate suture mayfacilitate VUA, however the long-term risk for stricture formation and impact on urinary continence is unknown. We sought to evaluate the effectiveness of VLOC for urinary reconstruction with minimum 1 year follow-up.

Methods: A prospective, randomized study was conducted in 120 consecutive RARP. Assurance of watertight closure was ensured with 300mL intraoperatively. Suture related complications, validated-questionnaire continence and a cost analysis were analyzed.

Results: Compared to conventional reconstruction, there was a significant reduction in mean reconstruction time (14.1 vs. 22.2min; p<0.01). Need to readjust suture tension or place additional LapraTy clips to establish a watertight closure was observed in 13 (22%) vs. 5 (8%) of cases (p=0.05). Time to foley removal was comparable between groups (4.1 vs. 4.2 days, p=0.87). Need for catheter replacement was similar between groups (both

5%). With a mean follow-up of 18.2 months, no delayed clinical anastomotic leaks or bladder neck contractures were observed in either group. Padfree continence outcomes at 1 (64% vs. 69%, p=0.60), 3 months (76% vs. 81%, p=0.54), 6 months (88% vs. 92%, p=0.67) and 12 months (90% vs. 92%; p=0.57), were also comparable.
Conclusions: Compared to standard monofilament suture, use of VLOC suture appears to provide a safe, more efficient and cost effective urinary reconstruction during RARP. Use of the interlocked-VLOC suture technique prevents slippage, precluding the need for assistance, knot tying and constant reassessing of anastomosis integrity. More important, to the best of our knowledge, this is the longest follow-up with such soft-tissue suture material for urinary reconstruction. Despite initial concern for increased inflammation from delayed material absorption and suture barbs, no adverse outcomes are observed in long-term assessment.

MP-01.14
Comparison of Open and Robotic-assisted Prostatectomy: The University of British Columbia Experience

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Introduction and Objectives: The purpose of this study is to report on outcomes and costs of open prostatectomy (OP) versus robotic-assisted prostatectomy (RAP) at a single tertiary care university hospital.
Methods: Retrospective analysis has been done on the last 200 patients operated by one experienced open surgeon (MG) and the last 200 patients operated by one experienced robotic surgeon (LG), as of October 1st 2011.
Results: The 2 groups had similar demographics, including mean age (64.7 vs. 64.2), mean body mass index (27.2 vs. 27.2), and rate of prior abdominal surgery (31% vs. 27%). The OP group had more high risk cancers compared to the RAP group (32.5% vs. 8.5%). Operative room time was less for the open cases, with mean skin-to-skin time of 114.2 mins versus 234.1 mins. The OP group had a higher mean blood loss of (402.8 ml vs. 287.5 ml). The transfusion rate was similar at 1.5% (3/200) in the OP group compared to 3.5% (7/200) in the RAP group. For the last 100 cases, the mean length of stay was 1.78 days for the open cases compared to 1.76 days for the robotic cases. The OP group had more high grade disease in the prostatectomy specimen, with Gleason 8 or more in 23.5% compared to 3.5% in the RAP group. The positive surgical margin rate was comparable at 31% for the OP group overall and 24.6% for the RAP group. The rate was also comparable after stratification between pT2 and pT3. Preliminary results for postoperative outcomes revealed similar stress urinary incontinence rates at 12 months of 3.9% for the open cases and 5.8% for the robotic cases. The biochemical-free status at 12 months was also comparable at 95.7% and 94.3% respectively. The added cost of robotic prostatectomy was calculated as 5629$ per case.
Conclusions: In this study, open prostatectomy had a shorter operative time and a lower cost compared to the robotic-assisted approach. Transfusion rates, length of hospital stay, positive surgical margin rates and preliminary postoperative outcomes were similar.

MP-01.15
How Does Robot-assisted Laparoscopic Radical Prostatectomy Compare to Open Surgery in Men with High Risk Prostate Cancer?

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Introduction and Objectives:: Contemporary studies at high volume centres have suggested equivalent oncologic outcomes when comparing open radical prostatectomy to robot assisted laparoscopic radical prostatectomy (RALP). However, the use of RALP in men with high-risk tumors has been debated. The objective of this study was to compare oncologic outcomes in patients who underwent open and robotic surgery at a single institution.
Methods: A retrospective analysis of D'Amico high-risk patients treated with open or robotic surgery at UCSF from 2002 to 2011 was conducted. Multivariate logistic regression was used to assess likelihood of positive surgical margins by surgical approach, adjusting for age, common tumor characteristics, and degree of nerve sparing. Time to tumor recurrence by surgical approach was evaluated with Cox proportional hazards regression, controlling for similar tumor characteristics, degree of nerve sparing, and adjuvant treatment.
Results: 177 open radical prostatectomy and 234 RALP patients made up the final cohort for analyses. Mean age was 61.6 years (SD=6.6) and median follow-up was 27 months (range 2-112). RALP patients experienced less blood loss (median 200 vs. 400 cc, p<0.01) and underwent complete bilateral nerve sparing more often (54% vs. 34%, p<0.01) then those undergoing open surgery. Those undergoing open surgery were more likely to have a lymph node dissection and nodal involvement. There were no differences by approach in pathological grade, stage, or positive margin rate. Recurrence-free survival was similar at 2 years (84% and 79%) and 4 years (68% and 66%) after open and robotic surgery, respectively (log-rank p=0.53).
Conclusion: This study is novel in that it assesses outcomes of open versus robotic prostatectomy in a cohort of high-risk men at a single institution. Surgical approach was not associated with oncologic outcomes after surgery with short-term follow-up making RALP a feasible option for men with high-risk prostate cancer.

MP-01.16
Positive Surgical Margins at Radical Prostatectomy: Population-based Averages within PSA and Gleason Strata

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Introduction and Objectives: Positive surgical margins (PSM) at the time of radical prostatectomy (RP) are an independent predictor of biochemical recurrence, local recurrence and distant metastasis. Avoidance of PSM is desirable and is the only risk factor for poor outcomes that can be altered by the surgeon. Rates of PSM vary in the literature and are often based on information from single institutions and centres of excellence. We therefore sought to explore the rates of PSMs on a population level and establish the risk factors for its occurrence in this group.
Methods: Men undergoing RP were identified from the SEER database for the years 2004 - 2007. Differences between those with and without PSM were compared with chi-squared tests. The proportion of cases with PSM were stratified by PSA and Gleason sum for both pT2 and pT3a tumors. Differences in PSM within strata were determined with chi-squared tests.
Results: 28,461 RP patients were identified and a PSM was present in 19.5%. PSM were 42% in pT3a and 16% in pT2 cases. PSMs were grouped into PSA and Gleason sum strata within each pTstage (Table 1). Higher PSAs (<4.0, 4-9.9, >10) were associated with higher proportions of PSM (12%, 20% and 28%, p<0.001). Similarly, higher Gleason scores (≤6, 3+4, 4+3, ≥8) were associated with higher PSM (12%, 22%, 27% and 33%, p<0.001). For pT2 tumors, the proportion of PSM ranged from 8% (Gleason ≤6, PSA <4.0) to 28% (Gleason 8-10, PSA ≥10). For pT3a tumors, PSM were higher in each Gleason/PSA strata compared to those

with pT2 tumors, reaching 63% for those with pT3a, Gleason 8-10, PSA >10 disease.
Conclusions: In this population-based study of PSM after RP, the proportion of PSM vary significantly within different PSA and Gleason strata for organ confined and extracapsular disease. This data can be used as a reference for urologist self-assessment.

MP-01.17
Prostate Cancer Less than Two Cells from the Surgical Margin Predicts Biochemical Recurrence

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Introduction and Objectives: A positive surgical margin at the time of radical prostatectomy (RP) is an independent predictor of biochemical recurrence (BCR). Previous studies examining the distance between the cancer and a negative surgical margin did not find an increase in BCR. However, these studies were limited by either a small sample size or a relatively large cancer to surgical margin distance analyzed as a continuous variable. We hypothesized that the distance PCa cells are from a negative surgical margin predicts for BCR.
Methods: Since 1998, all RP specimens and clinical outcomes at our centre have been entered into a prospective database. Margin status is categorized as "negative," "close" (between 2-6 cells from margin), "abuts" (≤2 cells from the margin) or "positive" (ink touching margin). We examined all men undergoing RP without neoadjuvant treatment who had an undetectable postoperative PSA. We used multivariate cox regression analysis to determine if margin status was predictive of PSA recurrence adjusting for pathologic T stage, Gleason score, age, race, adjuvant radiotherapy, and diagnostic serum PSA.
Results: The study was based on 1588 patients. 193 (12%) patients had BCR. Median follow-up was 25 months. On multivariate analysis, the risk of BCR for patients with "close" margins was similar to those with negative margins (HR 1.12, 95%CI 0.67-1.92). Those patients with margins that "abut" (HR 2.13, 95%CI 1.23-3.69) had a risk of BCR that was similar to those with positive margins (HR 2.25, 95%CI 1.62-3.12). There was no difference in risk of BCR between patients with margins that "abut" the cancer and margins that were positive.
Conclusions: At RP, those patients with PCa that abuts the surgical margin (≤2 cells from margin) have a risk of BCR that is similar to those with a positive surgical margin. These findings have implications for pathologic reporting of margin status, counseling of postoperative patients, and consideration for adjuvant therapy.

MP-01.18
Striated Muscle in Radical Prostatectomy Specimens: Is It Predictive of Post-prostatectomy Urinary Incontinence?

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Introduction and Objectives: Urinary incontinence (UI) following radical prostatectomy (RP) for prostate cancer has become an increasing concern due to the rising number of RPs being performed and the burden it places on quality of life. We hypothesized that the amount of striated muscle removed with the apical aspect of the prostate at RP can be predictive of post-RP UI.
Methods: The records of 61 consecutive patients seen in follow-up after RP were reviewed and complete clinical data was collected. Two uropathologists reviewed the H&E sections of the apical margin to semiquantitatively assess the amount of striated muscle (SM) according to the following scheme: 0 - no SM, 1 - 1-10% SM (of total tissue), 2 - 11-30% SM and 3 - >30% SM. At our institution, the apical margin is defined as the distal 3 mm around the urethra. This section is divided into left and right halves, sectioned perpendicularly and submitted in two paraffin blocks. The SM scores for the two halves were averaged to give a final SM score for each case. Continence status was determined based on the last clinical visit, with UI considered any reported leakage.
Results: Patients had a median age of 62 years at surgery (SD +/- 6.34, range 43-73) and a median follow-up after surgery of 23 months (SD +/- 18.43, range 1-77). A SM score of ≥2 had a specificity of 97.5% and sensitivity of 19.0% for incontinence (LR 7.619, p=0.0437). Age at surgery (mean 64.10 vs. 60.63 years, p=0.0413), prostate volume on TRUS (mean 42.06 vs. 33.85 cc, p=0.0257) and prostate weight (mean 52.51 vs. 43.99 g, p=0.0489) were associated with an increased risk for UI.
Conclusions: The amount of SM seen in the pathology specimen following RP can have a significant effect on post-RP UI. This could be utilized in the future to predict and counsel patients following surgery.

Table 1. MP-01.16. Positive surgical margins stratified by pathological stage, PSA and Gleason score

Organ Confined (pT2)									
PSA Level	Gleason 2–6		Gleason 3 + 4		Gleason 4 + 3		Gleason 8–10		*p*-value
	N	% Positive Margin	N	% Positive Margin	N	% Positive Margin	N	% Positive Margin	
<4.0	2903	7.9	1529	14.1	278	15.1	169	16.6	<0.001
4–9.9	7305	12.6	6681	19.4	1416	19.4	942	20.2	<0.001
10+	1207	12.1	1283	24.7	379	26.7	387	28.4	<0.001
p-value	<0.001		<0.001		0.002		<0.001		
Extra-Capsular Extension (pT3a)									
PSA Level	Gleason 2–6		Gleason 3 + 4		Gleason 4 + 3		Gleason 8–10		*p*-value
	N	% Positive Margin	N	% Positive Margin	N	% Positive Margin	N	% Positive Margin	
<4.0	78	28.2	211	28.9	87	34.5	97	36.1	0.50
4–9.9	334	37.7	1132	38.7	507	38.7	517	44.7	0.09
10+	64	34.4	361	44.9	277	53.1	315	62.5	<0.001
p-value	0.28		0.001		<0.001		<0.001		

PSA: prostate-specific antigen.

MP-01.19

Radiotherapy after Radical Prostatectomy: Treatment Recommendations Differ between Urologists and Radiation Oncologists

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Introduction and Objectives: To describe the practice patterns and attitudes of urologists and radiation oncologists for adjuvant and salvage radiotherapy after radical prostatectomy.

Methods: In October 2011, Canadian urologists and genitourinary radiation oncologists were solicited to participate in an on-line survey. Respondent characteristics collected included; age, specialty, practice setting, patient volume/experience, and access to surgery/radiotherapy. Likert scales were used to assess participant practice patterns and attitudes towards the use of adjuvant and salvage radiation in several clinical scenarios.

Results: Of 586 emailed clinicians, 148 staff physicians participated in the survey (106 urologists and 42 genitourinary radiation oncologists). Among participants, 26 (25%) urologists and 23 (55%) radiation oncologists had subspecialty training in genitourinary oncology. A majority of urologists (49; 58%) and radiation oncologists (36; 90%) report that recent randomized trials have changed the way they view and utilize post-prostatectomy pelvic radiation. We identified significant differences of opinion between urologists and radiation oncologists (Table 1). For example, there is nearly 50% absolute difference in the proportion of clinicians that recommend post-surgery adjuvant radiation for a 60 year-old with Gleason 6 pT2R1 prostate cancer (recommended by 70% of radiation oncologists compared to 21% of urologists). The associations between specialty and other respondent characteristics and the decision to recommend post-prostatectomy adjuvant and salvage radiation will be presented in detail.

Conclusions: The evidence supporting adjuvant and salvage pelvic radiation for the post-prostatectomy patient is evolving. Recent randomized trials have influenced management. However significant differences exist in the opinions of urologists and radiation oncologists. This study highlights these differences and assists in targeting education and future research.

Table 1. MP-01.19. A fit 60-year-old male is in your office following a radical prostatectomy. His PSA at 3 months postoperatively is undetectable. Do you favour treatment for this man with aXRT within 6 months of surgery with an undetectable PSA

	Urology	Radiation Oncology
Gleason 6/Stage pT2 R1	18 (21%)	28 (70%)
Gleason 6/Stage pT3a R0	15 (18%)	23 (57%)
Gleason 6/Stage pT3a R1	50 (60%)	32 (82%)
Gleason 7/Stage pT2 R1	38 (45%)	30 (77%)
Gleason 7/Stage pT3a R0	27 (32%)	30 (75%)
Gleason 7/Stage pT3a R1	64 (76%)	36 (90%)
Gleason 8-10/Stage pT2 R1	65 (77%)	36 (90%)
Gleason 8-10/Stage pT3a R0	46 (55%)	36 (90%)
Gleason 8-10/Stage pT3a R1	75 (89%)	37 (92%)
Any Gleason/Stage pT3b R0	50 (59%)	37 (92%)
Any Gleason/Stage pT3b R1	70 (83%)	38 (95%)

PSA: prostate-specific antigen; aXRT: adjuvant radiation.

MP-01.20

Osteoporosis Management Program Decreases the Incidence of Hip Fracture in Prostate Cancer Patients on Androgen Deprivation Therapy

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Introduction and Objectives: Androgen deprivation therapy (ADT) as a treatment for prostate cancer can cause osteoporosis, which can result in hip fractures. Kaiser Permanente Southern California's (KPSC) osteoporosis disease management program, Healthy Bones Program (HPB), has shown to reduce hip fracture rates in the osteoporotic population. We aim to assess if prostate cancer patients on ADT can also experience a lower rate of hip fracture.

Methods: Since 2002, HBP was implemented across KPSC. HBP patients are given a dual x-ray absorptiometry scan (DEXA), and started on Vit D/calcium and/or bisphosphonates based on their T score. Using KPSC Cancer Registry, we performed a retrospective review of 2176 patients who are diagnosed with prostate cancer between January 2003 and December 2007 who are on ADT up to September 2008. Patients who were in the HBP were identified by presence of DEXA scans. The number of hip fractures was recorded.

Results: There were a total of 1482 patients, with 1071 patients in HBP, and 411 patients in the non-HBP group. The mean age was older in the HBP group, 74 vs. 71 years, respectively ($p<0.01$). The mean total number of leuprolide dosages given was also higher for the HBP group, 6.3 vs. 4.7, respectively ($p<0.01$). The racial breakdown was similar between the two groups ($p=0.5$). The incidence rate of hip fractures per 1000 person years was lower for the HBP group, 5.1 vs. 18.1, respectively. For patients who sustained hip fractures, median time from first leuprolide dose to hip fracture was longer for the HBP group, 801 days to 528 days, respectively.

Conclusions: Hip fracture incidence rates are reduced by over 1/3 when ADT patients are enrolled in HBP. Due to the high health care costs and high morbidity/mortality of hip fractures, this finding may have a significant implication in the management of this large population of patients on ADT for prostate cancer.

MP-01.21

Testosterone Suppression: Impact of Testosterone Level on Disease Progression in Advanced Prostate Cancer

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Introduction and Objectives: In patients with advanced prostate cancer, medical castration remains a mainstay of treatment. A testosterone level below 50 ng/dL has been previously accepted as the benchmark level for clinical trials. However, there is mounting evidence that lower testosterone levels may be associated with improved clinical outcomes. We evaluated our cohort of patients with advanced prostate cancer to assess the impact of testosterone suppression on progression to castrate resistant prostate cancer (CRPC).

Methods: Patient data was obtained from a prospective database of patients undergoing androgen deprivation therapy (ADT) at a tertiary centre from 2006-2011. Patients were followed-up with a clinical assessment, testosterone level and PSA level every 3 months. Patients were considered to have progressed to CRPC when there were at least 2 consecutive rises in PSA above nadir, clinical progression, or death from disease. Patients were stratified into two risk groups based on 9-month absolute and 1-year mean testosterone levels following initiation of ADT. Baseline characteristics between risk groups were compared using the Student's t-test and chi-squared test. Probability of disease progression was assessed using the Kaplan-Meier method and compared using the log-rank test.

Results: Thirty-two patients were included. Mean patient follow-up was 25.7 months with 50.0% free of CRPC at last follow-up. Patients with 9-month absolute testosterone less than 32 ng/dL had a significantly increased time to CRPC (log-rank $p=0.001$). Patients with 1-year mean

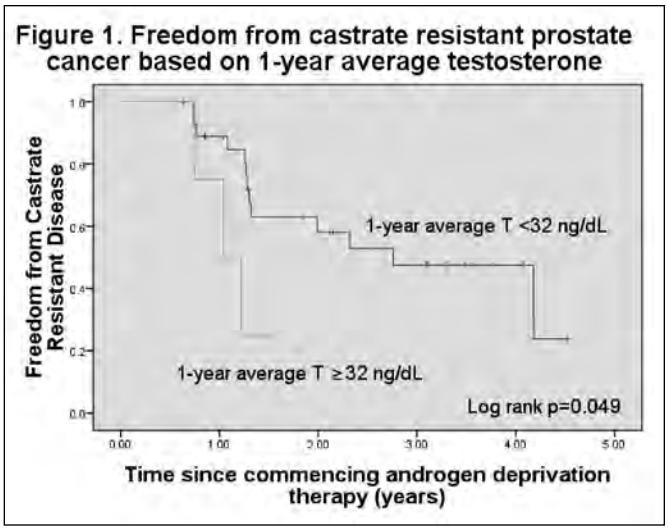

Fig. 1. MP-01.21.

testosterone less than 32 ng/dl also had a significantly increased time to CRPC (log-rank p=0.05). Patients did not differ significantly in their baseline characteristics (p>0.05) (Fig. 1).

Conclusions: Testosterone level in the first year following initiation of ADT may serve as an early predictor of disease progression. Routine testosterone measurement has a role in management of patients receiving ADT.

MP-01.22

Inadequate Testosterone Suppression in Prostate Cancer Patients Failing on GnRH Agonists: Preliminary Data from the Delay Study

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Introduction and Objectives: Inadequate testosterone (T) suppression on gonadotropin-releasing hormone (GnRH) agonist therapy has been linked with reduced time to castration-resistant prostate cancer and decreased overall survival. We report baseline T data from DELAY (Hormone Sensitive Prostate Cancer Patients Switched to Degarelix Therapy after Failing on GnRH Agonists: A Prospective, Observational, Phase IV Study).

Methods: Patients with biochemical PSA progression on GnRH agonist therapy defined as ≥50% increase in PSA between 2 measurements (≥1 week apart) are eligible. Prior treatment with chemotherapy, radiopharmaceuticals, estrogen, ketoconazole or other secondary hormonal treatments such as antiandrogens (except <3 months for induction) is not allowed. As of January 10, 2012 baseline T had been assessed in 44 of 105 planned patients. Here we compare T suppression on GnRH agonist to 3 levels: 1.7 nmol/L (traditional castrate level), 1.1 nmol/L (previously reported in the literature) and 0.7 nmol/L (orchiectomy).

Results: Median age of the 44 patients was 81 (range 63-93). Overall mean baseline T and PSA were 1.0 nmol/L (range 0.1-12.4) and 17.7 ng/mL (range 1.3-141.0), respectively. The percentage of patients with baseline T levels above 1.7, 1.1 and 0.7 nmol/L was 6.5% (3/44), 11.4% (5/44) and 25.0% (11/44), respectively.

Conclusions: A significant number of patients on GnRH agonists and with apparent PSA progression are not adequately castrated. Monitoring T levels is recommended to ensure adequate suppression and allow for corrective action if needed. The DELAY study will examine whether switching to Degarelix improves disease progression in patients both adequately and inadequately castrated on GnRH agonists.

Moderated Posters 2: Endourology/Stones
June 26, 2012, 1240-1440

MP-02.01
Holmium Laser Enucleation of the Prostate for Glands Larger than 200 Grams

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Introduction and Objectives: Holmium laser technology allows for enucleation of very large prostate glands with outcomes equivalent to or superior to those of open simple prostatectomy. Here we describe our experience with HoLEP for glands ≥200 grams.

Methods: Between January 1999 and February 2011, 58 patients with glands ≥200 grams underwent HoLEP at our institution. All procedures were performed by one surgeon (JEL). Residents and/or fellows assisted in all cases.

Results: Mean patient age was 72.6 years. Mean preoperative patient characteristics include transrectal ultrasound (TRUS) volume of 218 grams, AUA symptom score (AUASS) of 18.9, Qmax of 7.5 ml/sec, post-void residual (PVR) of 237.6 cc and PSA of 19.9 ng/mL. Mean enucleation and morcellation times were 86.7 min (range 30-211 min) and 49.3 min (range 23-133 min) respectively. Mean weight of tissue resected was 213.4 grams (range 111.1 – 532.2 grams). Two patients (3.4%) required perineal urethrostomy. Eight patients (13.8%) had concomitant procedures [bladder neck incision (2), cystolithopaxy (5), bladder biopsy (1)]. One patient (1.7%) required cystotomy for tissue retrieval. One patient required same-day take back for clot evacuation and one patient required take back 48 hours postoperatively to complete morcellation. Mean pre- and postoperative hemoglobin were 14.1 g/dL and 11.5 g/dL, respectively. Two patients (3.4%) required transfusion (mean 4 units). Mean catheterization time was 19.9 hours (range 8-96 hours) and all patients voided spontaneously after catheter removal. Mean AUASS at 12 months was 3.86 and mean PVR at 12 months was 34.9 cc. Mean PSA at 6 months was 0.85 ng/ml (mean reduction 87.4%). To date, one patient (1.7%) has developed a urethral stricture and 0 patients have required secondary procedures.

Conclusions: HoLEP can be safely performed in patients with glands ≥200 grams. In experienced hands, results equivalent to or superior to open simple prostatectomy can be expected.

MP-02.02
Impact of 5-alpha reductase Inhibitors on Enucleation and Morcellation Efficiency during Holmium Laser Enucleation of the Prostate

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Introduction and Objectives: HoLEP is a well-established effective treatment for benign prostatic hyperplasia (BPH) that involves complete removal of the transitional zone. Due to the large volume of tissue accumulated during enucleation, morcellation is required for specimen removal. Enucleation and morcellation times are dependent on a number of factors, including prostate volume as well as tissue quality. 5-alpha reductase inhibitors (5ARIs) are a commonly prescribed medication for BPH that reduces prostate volume by inhibiting conversion of testosterone to DHT and may impact tissue quality. We hypothesized that patients taking 5ARIs prior to HoLEP may have longer surgeries secondary to a more challenging enucleation and/or morcellation. Factors potentially impacting tissue enucleation and morcellation were analyzed.

Table 1. MP-02.02. Holmium laser enucleation of the prostate: patient characteristics

	5 ARI (-)	5 ARI (+)	
N	492	222	
Mean prostate weight (g)	79.9	94.7	$p = 0.001$
Mean enucleation time (min)	66.1	66.2	$p = 1.0$
Mean enucleation rate (g/min)	1.3	1.6	$p = 0.001$
Mean morcellation time (min)	18.5	20.8	$p = 0.1$
Mean morcellation rate (g/min)	5.5	5.6	$p = 0.8$

ARI: alpha reductase inhibitors.

Table 2. MP-02.02. Univariate and multivariate analysis predicting enucleation time

	Enucleation Time
Univariate	
Age	0.07 ($p = 0.06$)
PSA	0.11 ($p = 0.05$)
5 ARI	-0.002 ($p = 1.0$)
Duration of 5 ARI	-0.04 ($p = 0.6$)
Weight of specimen	0.3 ($p < 0.001$)
Presence of cancer	-0.07 ($p = 0.07$)
Multivariate	
Age	0.02 ($p = 0.7$)
PSA	0.02 ($p = 0.8$)
5 ARI	0.01 ($p = 0.9$)
Weight of specimen	0.29 ($p < 0.001$)
Presence of cancer	-0.06 ($p = 0.2$)

ARI: alpha reductase inhibitors; PSA: prostate-specific antigen.

Methods: A retrospective single institution analysis of HoLEP patients between 1998 and 2011 was performed. Variables that may impact enucleation and morcellation times were evaluated using univariate and multivariate linear regression models.

Results: Overall, of 714 patients who underwent HoLEP 222 or 31.1% of patients were taking a 5ARI (Table 1). After univariate and multivariate analysis, only weight of the specimen that is removed was found to be predictive of enucleation and morcellation times (Table 2, Table 3). More specifically, with increasing prostate size there was a statistically significant increase in both enucleation and morcellation times.

Conclusions: On multivariate analysis only specimen weight significantly predicts enucleation and morcellation times. The use of 5ARIs as a predictor of enucleation and/or morcellation times was not found to be statistically significant.

Table 3. MP-02.02. Univariate and multivariate analysis predicting morcellation time

	Morcellation Time
Univariate	
Age	0 12 (p=0.002)
PSA	0.24 (p<0.001)
5 ARI	0.06 (p=0.1)
Duration of 5 ARI	0.001 (p=1.0)
Weight of specimen	0.67 (p<0.001)
Presence of cancer	-0.07 (p=0.08)
Multivariate	
Age	0.02 (p=0.5)
PSA	-0.02 (p=0.4)
5 ARI	-0.03 (p=0.3)
Weight of specimen	0.68 (p<0.001)

PSA: prostate-specific antigen; ARI: alpha reductase inhibitors.

MP-02.03

Early Outcomes of Office-based Laser Vaporization of the Prostate with the High Power Diode Laser

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Introduction and Objectives: Advances in laser technology over the last fifteen years have significantly altered the treatment of lower urinary tract symptoms due to benign prostatic hyperplasia (BPH). Despite improvements in technology and refinements in surgical technique, these procedures continue to require general or regional anesthesia. Our goal was to study the feasibility and efficacy of ablative laser prostatectomy using the high power diode laser performed in the office, obviating the need for general or regional anesthesia.

Methods: Patients were evaluated with an American Urological Symptom Score (AUASS), Quality of Life score, Sexual Health Inventory for Men score, maximum flow rate (Qmax), postvoid residual volumes and prostate specific antigen (PSA). Patients received an oral narcotic and anxiolytic, a transrectal ultrasound guided prostate block and 1% xylocaine intraurethral injection. They then underwent prostate vaporization using the 180W high power diode, end-firing laser system. Follow-up assessments were made at three and six months.

Results: 24 men, with a mean age of 70.6 years (range 53-86), successfully underwent in office laser prostatectomy. The mean prostate volume was 42.6 grams (range 20-78 grams) and mean PSA was 1.8±1.2 ng/mL. Mean energy used 250,941±61,986 Joules. All patients were able to successfully complete the procedure. Patients had a urethral catheter for a mean of 3.5 ± 1.8 days. At three months, patients experienced a significant reduction in AUA-SS from 21.1±5.4 to 11.0±4.7. Maximum flow rates also significantly improved from 10.1±3.7 to 19.4±8.4 mL/sec. Patients reported similar durable results at six month follow-up.

Conclusions: Our short-term results suggest the high power diode laser was effective in relieving lower urinary tract symptoms related to BPH. It can be performed safely and effectively in an office based setting.

MP-02.04

Novel Ultra-low Dose Non-contrast CT (NCCT) for Urolithiasis: Prospective Comparison of Diagnostic Accuracy with Concurrent Standard Dose Imaging

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Introduction and Objectives: NCCT is the gold-standard diagnostic study for urolithiasis evaluation. However, concerns over the potential risks related to ionizing radiation may limit its use. Ultra-low dose (ULD) NCCT could potentially lower radiation exposure below that of a conventional KUB, but an acceptable level of diagnostic accuracy must be maintained. We report preliminary results of our ongoing prospective ULD NCCT trial for renal stone detection.

Methods: Following informed consent, NCCT for urolithiasis evaluation was performed in 10 consecutive adults (mean age, 55.8 years; mean BMI, 27.5), using our standard-dose (SD) protocol immediately followed by a matched ULD series. All scans were performed on a GE Discovery CT750 HD scanner. Axial and coronal 5x3mm reconstructions were obtained for each series. The 40 total series were anonymized and interpreted in random order for urolithiasis detection.

Results: For the ULD series, the range of dose reduction relative to SD was 82-90% (mean, 87% reduction), with a mean effective dose ranging from 0.88 mSv to 1.54 mSv (mean, 0.99 mSv). Seven cases were below 1.0 mSv. A total of 29 renal calculi (range, 1-22 mm; mean, 4.1 mm) were identified at SD NCCT, of which 22 (75.9%) were detected at ULD. Overall sensitivity was 76%, however, subgroup analysis by stone size showed improved detection rates for stones ≥3 mm, i.e. all 19 calculi ≥3 mm were seen on both ULD reconstructions. Only 10-30% of stones ≤2 mm was prospectively identified on the ULD series.

Conclusions: Ultra-low dose NCCT for urolithiasis in the 1 mSv range can accurately detect calculi ≥3 mm but fails to detect most stones ≤2 mm. Typically the clinical ramifications of these stones (≤2 mm) is less relevant acutely. The degree of dose reduction that preserves diagnostic accuracy for tiny calculi remains uncertain, but may be influenced by further improvements in iterative reconstruction techniques.

MP-02.05

Does a Routine Baseline Plain Radiograph Influence the Need for Subsequent Imaging Studies in Patients with Ureteral Calculi?

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Introduction and Objectives: Non-contrast CT is the gold standard for diagnosing ureteral calculi. A KUB X-ray (kidneys-ureters-bladder), at the time of CT, has been presumed to aid interpretation of future KUBs. However, the CT's scout film may make the baseline KUB redundant. Our objective was to determine if a baseline KUB allows the clinician to more definitively detect if the patient has passed the ureteral stone, thereby avoiding additional imaging.

Methods: Patients with a ureteral calculus on CT and a baseline KUB within 24 hours were retrospectively identified, then randomly divided into 2 groups: "No baseline KUB" and "baseline KUB". In the "No KUB" group, only the CT (with scout) and follow-up KUB were viewed. The "KUB" group was similar to current practice, where the baseline KUB could also be viewed. On viewing the follow-up KUB, 3 urologists independently answered "has the ureteral stone passed or migrated since the CT?" (yes, no or indeterminate). A follow-up KUB assessment was considered definitive if all 3 agreed on either "yes" or "no".

Results: 24 stones in the "No KUB" and 25 stones in the "KUB" group were identified from September 2007 to August 2009. The stone location was proximal in 20 (41%), middle in 3 (6%) and distal in 26 (53%). The patient and CT stone characteristics were not statistically different between the 2 groups. Overall, 51.0% of the stones were visible on CT scout and there was no difference between the groups. The rates of definitive assessment were similar between the "No KUB" and "KUB" groups (45.8% vs. 36.0%, p=0.484).

Conclusions: A baseline KUB did not affect the clinician's ability to assess stone passage or migration on a follow-up KUB. These findings challenge

the common practice of obtaining a baseline KUB at the time of CT, with its associated cost and radiation exposure.

MP-02.06

Urolithiasis Prevention Beginning in the Emergency Room: Support for Early Intervention During the Acute Event

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Introduction and Objectives: Few studies have addressed patient preferences regarding education and prevention of urolithiasis in the acute setting. Such early assessment of patient views may help in developing more effective prevention and therapeutic plans. The objective of this study was to determine patient preferences on early stone prevention strategies at the time of initial presentation.

Methods: Patients presenting to the emergency room (ER) with renal colic were given a questionnaire once their pain was adequately controlled and prior to ER discharge. The survey consisted of 15 questions which were grouped into 4 domains: (1) assessment of past history/knowledge of stone disease, (2) views about learning and prevention, (3) views about long-term medical/nutritional management, and (4) views about long-term follow-up for stone recurrence.

Results: Forty patients completed the questionnaire. One of the 40 patients was on prior treatment for stone disease (domain 1). Positive response rates were as follows: domain 2, 90%; domain 3, 86%; domain 4, 81%. An overall positive bias towards early education and prevention was 85%. The following responses were notable: in domain 3, all but one patient responded "yes" to implementing dietary changes; only 80% were willing to take medications, and even fewer (65%) were willing to take >1 medication to achieve the same goal. In domain 4, only 65% were willing to be followed in the metabolic stone clinic. All patients showed a preference for life-long prevention over repeated surgical procedures.

Conclusions: These data identify that patients are very willing to learn more about their disease at onset and support stone prevention strategies, particularly dietary changes; they are less inclined to take medications or follow-up in stone clinic. These considerations support early education in new stone formers and underscore the importance of intervention timed as close as possible to an acute event.

MP-02.07

Characterization of Patients with Heterozygous Cystinuria

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Introduction and Objectives: To characterize contemporary cohort of patients with heterozygous (TZ) cystinuria and compare them with a concurrent cohort of homozygous (MZ) cystinuria.

Methods: A retrospective review of prospectively collected data was performed for 42 consecutive patients presenting with positive cyanide-nitroprusside test (CNT) for cystinuria between September 2009 and September 2011. Demographic and clinical data were collected with detailed metabolic stone work-up, including two 24-hour urine collections. Based on daily cystine excretion, patients were divided into TZ group (≤400 mg/day or ≤1.7 mmol/day) and MZ group (>400 mg/day or >1.7 mmol/day).

Results: One patient was excluded since quantitative cystine excretion was within the normal range. Thirty five (83.3%) and 6 (14.3%) patients were

Table 1. MP-02.07. Comparison between heterozygous and homozygous cystinuria

Variable		Heterozygous n= 35	Homozygous n= 6	*p*-value
Median age in years (range)		51 (20 - 74)	43 (7 - 52)	0.08
Median BMI in kg/m^2 (range)		27.5 (20.8 - 38.4)	33.8 (18.7 - 42.5)	0.33
Left-sided		21/31 (67.7%)	2/3 (66.7%)	0.98
Bilateral stones		3 (8.6%)	3 (50%)	**0.03**
Female gender		7 (20.0%)	4 (66.7%)	**0.03**
Family history of stones		11 (31.4%)	2 (33.3%)	1.0
Median Age at first stone episode in years (range)		48 (14 - 67)	17 (6 - 44)	**0.002**
Median number of stone episodes (range)		1 (1 – 4)	3 (1 – 4)	**0.04**
Median 24 hr cystine in mmol/day (range)		0.42 (0.14 - 1.5)	1.8 (1.8 - 2.7)	**<0.001**
Median 24 hr homocystine/ creatinine in umol/mmol cr (range)		0.9 (0.0- 13.3)	9.9 (6.7 - 16.4)	0.001
Median 24 hr cystine/ creatinine in umol/mmol cr (range)		17.2 (9.5 - 171.2)	148.5 (107.5 - 179.6)	0.001
24 hr cysteinglycine/ creatinine in umol/mmol cr (range)		0.26 (0.0 - 2.25)	0.8 (0.02 - 1.85)	1.0
Median urine pH (range)		6.0 (5.0 - 7.5)	6.5 (5.0 - 7.5)	0.82
Low e-GFR (<60 ml/min/1.73m^2)		1 (2.8%)	1 (16.7%)	0.27
Hyperparathyroidism (>65 pg/ml)		8 (22.8%)	2 (33.3%)	0.52
Inadequate vitamin D 25 (<29 ng/mL)		22 (62.8%)	4 (66.7%)	0.55
Hypercalcemia		2 (5.7%)	00	0.42
Hyperuricemia		6 (17.1%)	4 (66.7%)	**0.02**
24 hr urine volume/ml	Suboptimal	25 (71.4%)	5 (83.3%)	
	Median (range)	1400 (700 - 3400)	2125 (1100 - 3000)	0.48
24 hr urine calcium	Hypercalciuria	2 (5.7%)	00	
	Hypocalciuria	8 (22.2%)	4 (66.7%)	**0.03**
Hyperoxaluria		7 (20.0%)	1 (16.7%)	0.67
Hypomagnesuria		12 (34.3%)	00	0.63
Hyperuricosuria		7 (20.0%)	00	0.15
Hypocitraturia		7 (20.0%)	1 (16.7%)	0.63

BMI: body mass index; e-GFR: epidermal growth factor receptor.

found to have TZ and MZ cystinuria, respectively. When compared with TZ patients, MZ patients were significantly younger at first stone episode [median (range): 48 (14-67) vs. 17 (6-44) years, p=0.002], and had more females (20% vs. 66.7%; p=0.03), more bilateral stones (8.6% vs. 50%; p=0.03), and more stone episodes (1 vs. 3; p=0.04). The median 24-hour urinary cystine excretion was significantly higher in the MZ group [0.42 (0.14-1.5) vs. 1.8 (1.8-2.7) mmol/d; p< 0.001). Suboptimal urine volume was detected in 69.4% of TZ and 83.3% of MZ patients. Hyperuricemia was significantly higher in MZ group (17.1% vs. 66.7%; p=0.02). Whereas all 6 MZ patients formed pure cystine stones, 18 (51.4%), 7 (20.0%) and 3 (8.6%) patients in the TZ group formed calcium oxalate, uric acid, and cystine stones, respectively (p<0.001. Interestingly, 11 (31.4%) patients in the TZ group had false negative results on subsequent CNT (Table 1).
Conclusions: There were significant differences between heterozygous and homozygous cystinuria patients in terms of age at first stone episode, male to female ratio, incidence of hyperuricemia and stone compositions. The clinical significance remains to be elucidated.

MP-02.08
Office-based Ureteral Stent Placement Is Feasible and Effective for Acute, Obstructing Ureteral Calculi

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Introduction and Objectives: Ureteral stents can be safely placed in the office under local anesthesia (LA). We compared the outcomes of urgent ureteral stent placement using fluoroscopy for acute obstruction under LA against those placed under general anesthesia (GA) in the OR.
Methods: A retrospective review of all ureteral stents placed between Jan 2007 and July 2011 was conducted. Only cases involving primary stent placement for obstructing ureteral calculi were included in the analysis. The data was evaluated in two groups: GA and LA. Queries included demographic data, time from initial presentation to stent insertion, time from stent insertion to stone removal, success and complication rates, and patient tolerance.
Results: 119 primary stent insertion procedures were identified and reviewed; 73 were placed in the OR under GA, and 46 were placed with LA. No differences in mean age were seen between the two groups (54y and 52y in GA and LA, respectively, p=0.53), and no differences in gender distribution between the two groups were seen, p=1.0). The primary indication for urgent stent placement differed between the groups (p=0.005): in the GA group, 55% were placed for fever/pyuria and 33% for pain, whereas in the LA group 57% were placed for pain and 28% for fever/pyuria. Both GA and LA groups were typically stented within 12 hours of presentation, p=0.69. Mean time from stent insertion to stone removal was 33 days and 35 days in GA and LA groups, respectively, p=0.79. One procedure was terminated in the LA group due to pain; no significant differences in failure to stent were observed between the GA and LA group (1.3% versus 8.7%, respectively, p= 0.07). No major complications occurred in either group.
Conclusions: Urgent ureteral stent placement for symptomatic ureteral stones can be safely and effectively performed under LA in the office. This paradigm eliminates unnecessary GA, and this approach did not delay scheduling definitive therapy.

MP-02.09
Variations among Urology Trainees in Their Use of Fluoroscopy during Ureteroscopy

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Introduction and Objectives: In a training program, post-graduate trainees assist in performing URS under direct supervision of an attending urologist. Therefore, the aim of the present study was to assess variations among

Table 1. MP-02.09. Patient, stone and operative characteristics

Variable \ Trainee		A No. (%)	B No. (%)	C No. (%)	D No. (%)	E No. (%)	F No. (%)	G No. (%)	*p* value
No. of URS		11	18	18	11	16	13	13	NA
Male gender		7 (64)	12 (67)	12 (67)	8 (73)	12 (75)	7 (54)	8 (62)	0.74
Mean age (years) (95%CI)		55 (47-64)	50 (41-58)	55 (48-63)	50 (39-60)	56 (48-64)	56 (46-65)	50 (43-57)	0.69
Left-sided		7 (58)	9 (50)	7 (35)	5 (45)	11 (69)	10 (63)	6 (46)	0.58
Mean stone size (mm) (95%CI)		15 (10-20)	19 (9-29)	12 (10-15)	11 (7-14)	12 (8-15)	11 (8-14)	9 (6-11)	0.10
Stone location	Ureteral	3 (27.3)	9 (50)	6 (33.3)	6 (54.5)	9 (56.2)	7 (53.8)	5 (38.5)	0.57
	Renal	6 (54.5)	8 (44.4)	7 (38.9)	4 (36.4)	5 (31.3)	4 (30.8)	6 (46.1)	
	Both	2 (18.2)	1 (5.6)	5 (27.8)	1 (9.1)	2 (12.5)	2 (15.4)	2 (15.4)	
Multiple stones		6 (54 .5)	6 (33.3)	7 (38.9)	2 (18.2)	5 (31.3)	4 (30.8)	5 (38.5)	0.46
Lucent stones		3 (27.3)	2 (11.1)	3 (16.7)	0 (0)	3 (18.7)	1 (7.7)	0 (0)	0.15
Preoperative stones		3 (27.3)	11 (61.1)	13 (72.2)	4 (36.4)	8 (50.0)	8 (61.5)	10 (76.9)	0.16
URS-type	Flexible	6 (54.5)	9 (50.0)	8 (44.4)	5 (45.4)	6 (37.5)	6 (46.1)	2 (15.4)	0.84
	Rigid	1 (9.1)	4 (22.2)	3 (16.7)	1 (9.1)	2 (12.5)	1 (7.7)	4 (30.8)	
	Both	4 (36.4)	5 (27.8)	7 (38.9)	5 (45.4)	8 (50.0)	6 (46.1)	7 (53.8)	
Balloon dilations		1 (9.1)	2 (11.1)	1 (5.6)	2 (18.2)	0 (0)	0 (0)	2 (15.4)	0.77
Access sheath		7 (63.6)	10 (55.6)	8 (44.4)	5 (45.5)	6 (37.5)	5 (38.5)	3 (23.1)	0.03
Residual stone		2 (18.2)	5 (27.8)	3 (16.7)	2 (18.2)	3 (18.7)	1 (7.7)	2 (15.4)	0.35
Mean OR (min) (95%CI)		79 (50-107)	75 (59-91)	81 (67- 94)	66 (57-74)	81 (60-101)	76 (57- 95)	83 (56-110)	0.90
Mean fluoroscopy time (sec) (95%CI)		194 (115-272)	105 (65-144)	91 (66-117)	117 (58-175)	91 (52-131)	107 (71-143)	64 (36-91)	**0.004**

URS: ureterorenoscopy; CI: confidence interval; OR: operating room; NA: not available.

Table 2. MP-02.09. Predictors of fluoroscopy time on univariate and multivariate analysis

Variable		Univariate		Multivariate	
		Change/ sec	*p*-value	Change/ sec	*p*-value
Trainee	A	98.3	**0.001**	74.5	**0.01**
	B	-2.0	0.92	3.4	0.81
	C	-18.1	0.39	-12.4	0.32
	D	11.7	0.65	8.7	0.72
	E	-17.8	**0.04**	-8.7	0.02
	F	1.0	0.97	2.3	0.82
	G	-48.8	**0.03**	-36.7	**0.04**
Male gender		29.6	**0.04**	34	**0.02**
Age		8.8 /10 years	0.11	6.8 /10 years	0.15
left side		-11.6	0.74	6.8 sec	0.63
Renal stones		22.0	**0.048**	16.0	0.26
Multiple stones		14.8	0.38	- 26.6	0.19
Stone size		1.6 / mm	**0.04**	0.38	0.67
Lucent stones		6.5	0.79	14.6	0.52
Operative time		6.9/ 10 min	**0.004**	4.2/ 10 min	0.07
Balloon dilation		115.7	**0.001**	81.7	**0.004**
Preoperative stenting		-23.6	0.14	-25.4	0.08
Residual stones		67.6	0.001	54.1	0.01
Flexible ureteroscope		4.0	0.69	-3.9	0.69
Access sheath		62.4	**0.001**	41.7	**0.03**

post-graduate trainees in their use of FT during URS.

Methods: A retrospective review of prospectively collected data was performed for consecutive patients undergoing URS by urology trainees between July 2009 and December 2010. Trainees in the Post-Graduate Year-4 (PGY-4) assisted in performing these cases under the direct supervision of a single endourologist. Standard fluoroscopic unit using 30 frames per second was used in all cases. Patient and stone characteristics together with operative data were compared among trainees using univariate and multivariate analyses.

Results: Seven trainees (A, B, C, D, E, F, and G) assisted 100 URS with a median (range) of 13 (11-18) procedures per trainee. There were significant differences among the trainees in their use of fluoroscopy (p=0.004). The mean FT (95%CI) for trainees A through G were 194 (115-272), 104 (65-144), 91 (66-117), 117 (58-175), 91 (52-131), 107 (71-143) and 64 (36-91) seconds, respectively (p=0.004). There were no significant differences regarding patients (age and sex) and stone characteristics (size, laterality, location, and multiplicity) (p>0.05). Likewise, operative time and balloon dilation were comparable among trainees (p>0.05). There were significant differences among trainees in their use of access sheath (p=0.03). Trainees, male gender, balloon dilation, access sheath and residual stones maintained their significance in multivariate analysis as predictors of FT during URS (Table 1, Table 2).

Conclusion: Post-graduate trainees vary significantly in their use of fluoroscopy during URS. The trainees, male gender, balloon dilation, residual stones at the end of the procedure together with the use of access sheath were the most significant independent predictors of prolonged FT during URS.

MP-02.10

Prediction of Calcium Oxalate Monohydrate Stone Composition during Ureteroscopy

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Introduction and Objectives: Prior research shows that Ho:YAG lithotripsy produces tiny dust fragments at low pulse energy (0.2J). However, calcium oxalate monohydrate (COM) stones may not fragment at this low pulse energy. Stone composition is rarely known until after surgery and composition analysis performed. Historically, attempts to predict stone composition on the basis of endoscopic stone appearance were unsuccessful. Current endoscopic technology permits visual details that previously were not evident. As COM appears black under ambient light, we attempt to predict COM stone composition at the time of ureteroscopy by the endoscopic appearance of the stone.

Methods: Consecutive subjects undergoing ureteroscopy for stone disease were studied. Any portion of the stone that appeared black under endoscopic vision was considered clinical evidence of COM. Stone analysis was conducted postoperatively by infrared spectroscopy and x-ray diffraction crystallography. Predicted stone composition was correlated to postoperative stone analysis. Fisher's exact test was used for statistics (p<0.05 was considered significant).

Results: 46 consecutive ureteroscopic stone cases were analyzed prospectively. 25 of 28 subjects (89%) with black stones had stones later proven to be COM by composition analysis; versus one of 18 patients (6%) with non-black stones that were COM, p<0.0001. A black endoscopic stone appearance had a positive predictive value for COM of 89% and a non-black endoscopic stone appearance had a negative predictive value for COM of 94%, for a test sensitivity of 96% and specificity of 83%.

Conclusions: COM may reasonably be predicted intraoperatively by its

black endoscopic appearance. The clinical utility would be to use higher laser pulse energy settings than for non-COM compositions. This data raise the possibility that more sophisticated optical characterization of endoscopic stone appearance may prove to be a useful tool to predict stone composition.

MP-02.11

Backstop Eliminates Retropulsion and Withstands Ho:YAG Energy

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Introduction and Objectives: Laser lithotripsy can be compromised by retropulsion. Anti-retropulsion devices have been shown to prevent retropulsion. Pulsed Ho:YAG laser radiation is capable of destroying all metal materials. BackStop is a novel reverse thermosensitive polymer-based anti-retropulsion material. Response of Backstop to pulsed Ho:YAG radiation is unknown. We test BackStop as a retropulsion device and its ability to withstand Ho:YAG exposure.

Methods: U-cal Stone phantoms (0.25″ diameter, approximately 540 g) were targeted with Ho:YAG lithotripsy using a 365 um fiber at various power settings (0.2 J – 2.0 J pulse energies, 10-40 Hz) in an in vitro setup. Experiments were conducted in water in an 8 mm cylindrical tube. Phantoms were tested in two conditions: without stabilization and with BackStop deployed proximal to the stone. Retropulsion was measured. BackStop was also deliberately targeted with Ho:YAG energy to simulate accidental pass-pointing during laser lithotripsy. Ablation craters in BackStop were measured and function assessed. Laser polymer interaction was characterized using fast flash imaging and needle hydrophone.

Results: At all energy settings tested, retropulsion was greater for the non-stabilized stone vs. the stone stabilized with BackStop where no retropulsion occurred, $p<25$ bars. Modulation of frequency did not have effect on retropulsion.

Conclusions: BackStop can be ablated by Ho:YAG energy. However, it retains its shape and function. BackStop effectively eliminates retropulsion, even when it is accidently lasered.

MP-02.12

The Safety of Percutaneous Nephrolithotomy (PNL) in an Elder Population: Outcomes and Complications of Septuagenarians, Octogenarians and Nonagenarians

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Introduction and Objectives: Patients with a large stone burden presenting later in life may be felt to be at increased risk of complications and poor outcomes. Age alone has not been investigated in terms of saftey and efficacy. Our objective is to compare outcomes and complications of PCNL in septuagenarian, octogenarian and nonagenarians, compared to a younger population matched for stone burden.

Methods: We reviewed 231 PNLs (2006-2010), for demographics, age, ASA score, length of stay (LOS), and location of access. Stone size, clearance and complications were assessed. All patients over 70 years old were compared to a stone size matched, age adjusted control group of 20 patients between 30 and 60 years old.

Results: 32 PNLs in 28 patients over 70y (n=15 aged 71-79, 9 aged 80-89, and 4 aged 90-94) were performed. Mean age was 77y, ASA of 2.63, and had 2.86 comorbidities/patient. The control group (47.1y) had significantly reduced ASA scores of 1.78, with 1.10 comorbidities (p=0.001 and p=0.0001 respectively). Those >70y had significantly increased CV disease, hypertension, a.fib and cancer ($p<0.05$). Risk factors, first time presenters, and stone characteristics did not differ significantly. Stone free rate was 63.3% in those >70y and 74% in controls, without differences in OR time or LOS. There was an increased frequency of complications (33%), and Clavien class (2.08) (5 grade I, 1 grade II, 6 grade III) but did not differ significantly from controls (n=3, p=0.29).

Conclusions: In patients over 70y, we have found PCL efficacy and safety is equivalent to a younger population. Thus age alone should not be an excluding criteria. Concerns regarding multiple anesthetics, prone positioning, bleeding and LOS should be considered individually, rather than favoring second line therapies based on advanced age. Given this is a retrospective case controlled study, subtle trends may not have been appreciated.

MP-02.13–WITHDRAWN

MP-02.14

Retrograde Access for Percutaneous Nephrolithotomy: Is This The Way to Go?

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Introduction and Objectives: Percutaneous nephrolithotomy is the standard for large renal stones considered unsuitable for, or refractory to ESWL. Obtaining renal access is a crucial step, and is generally done in an antegrade fashion. Retrograde techniques provide an alternative means of establishing a nephrostromy tract and has many advantages, including establishing a tract in a decompressed kidney, accessing an optimal calyx, and decreased radiation exposure to the surgeon and patient. Purpose: To retrospectively assess outcomes in a single institution series of percutaneous nephrolithotomy using retrograde nephrostomy access.

Methods: Retrospective evaluation of 333 consecutive patients treated between May 2003 – July 2008. Measured variables included patient demographics, retrograde nephrostomy site, postoperative drainage, operative time, rate and degree of stone clearance, requirement for secondary procedures, stone composition and complications.

Results: Total number of patients reviewed was 333, median age 56 (range 17-87). Mean length of hospital stay was 2.5 days (range 1-13 days). 17 patients (5%) required placement of antegrade access due to difficult/suboptimal anatomy. Mean OR time was 76 min (range 10 min-246 min). 79% achieved complete clearance, 19% had minor residual fragments, 2% had significant persisting stones; 11 patients (3%) required secondary ESWL. Stone analysis: Calcium oxalate 57%, 24% uric acid, 5% infection stones, 21% others. Complications: 4 patients (1%) had a significant postoperative hemorrhage; 2 required angioembolization, 1 patient was transfused 4 units PRBCs, 1 was observed.

Conclusions: Retrograde percutaneous access for PCNL is a safe and effective approach, with comparable rates of stone clearance and complications to antegrade access.

MP-02.15

Without Stone Culture Infectious Kidney Organisms Are Misidentified in almost 1/4 of Patients Undergoing Percutaneous Nephrolithotomy

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Introduction and Objectives: One of the most significant complications of percutaneous nephrolithotomy (PCNL) is sepsis. In order to avoid this complication, preoperative urine cultures are used to adequately treat patients before performing PCNL. Patients who are known to harbor struvite stones are carefully scrutinized when preparing for PCNL. However, non-struvite stone formers may harbor equally lethal bacteria. As well, perioperative stone cultures can harbor different bacteria than preoperative urine cultures. The objective of this study is to demonstrate the relationship between stone type, stone culture and urine culture in order to enable one to adequately treat and/or prevent sepsis post-PCNL.

Methods: We performed a retrospective data analysis of percutaneous nephrolithotomy patients treated at one institution between 1999 and 2009.

Results: The overall agreement between urine and stone culture occurred in 361 cases (72.7%). A positive stone culture in the presence of sterile urine occurred in 10.5% of patients overall and this occurred most frequently in non-struvite stone formers (n=47, 10.8%). Of patients present-

Table 1. MP-02.15. Culture results of percutaneous nephrolithotomy patients grouped by stone mineral content

Stone Mineral Content	Both Negative (%)	Only Positive Urine Culture (%)	Only Positive Stone Culture (%)	Both Urine and Stone Culture Positive (%)	Total (%)
Struvite	9 (14.8)	11 (18.0)	5 (8.2)	36 (59.0)	61 (100)
Other	201 (46.2)	72 (16.6)	47 (10.8)	115 (26.4)	435 (100)
Total	210 (42.3)	83 (16.7)	52 (10.5)	151 (30.4)	496 (100)

ing with both a positive urine and stone culture (n=151), 67 or 44.4% (13.5% overall) were found to have different infectious organisms between the urine and the stone cultures. Therefore, 24% of patients will present with a positive stone culture in the presence of sterile urine (10.5%) or a different organism cultured from stone than from urine (13.5%).

Conclusions: The simplification of the infection stone being synonymous with struvite stone may have negative consequences in the clinical treatment and management of stone disease. As well, the utilization of urine cultures alone will often lead to misidentification of the actual infectious organism present in the kidney. Therefore, it is our belief that both the urine culture, as well as the stone culture, are useful in identifying and managing infectious risk associated with PCNL.

MP-02.16

Interim Analysis of a Multi-centre Randomized Controlled Trial Comparing Three Different Modalities of Newer Lithotrites for Intracorporeal Lithotripsy

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Introduction and Objectives: There are three newest intracorporeal lithotriptors are available on the North American market. The objective of this study is to compare the efficiency and fragmentation rate of these three modern lithotrites during percutaneous nephrolithotomy.

Methods: Patients undergoing percutaneous nephrolithotomy with stones greater than 2 cm in diameter were randomized to intracorporeal lithotripsy with the Cyberwand (Olympus-ACMI), Lithoclast Select (EMS/Boston Scientific Microvasive), or StoneBreaker (Cook Urological) and Olympus LUS-2 ultrasonic lithotripsy. The total time to perform the procedure including fragmentation time, grasping fragments, and ultrasonic lithotripsy was recorded. Clearance rate was calculated by dividing the surface area of the targeted stone by the total clearance time. Stone free rate was determined by postoperative CT scan or secondary nephroscopy within 30 days. (Table 1).

Results: Seventy-five patients to date have been enrolled in the study across multiple sites.

Conclusions: No patients required blood transfusion. Preliminary data shows that there was no significant difference in clearance efficiency or stone free rates among the different lithotripters. The study is ongoing and further patients will help determine if true differences exist among lithotrites in their efficiency of fragmenting stones during percutaneous nephrolithotomy.

MP-02.17

Combined Percutaneous Nephrolithotomy/Parathyroidectomy under One Anesthetic in Patients with Primary Hyperparathyroidism and Stones

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Introduction and Objectives: Up to 20% of patients with primary hyperparathyroidism (HPT) develop renal stones. Standard treatment for HPT is resection of the offending adenoma(s). We present our results for combined percutaneous nephrolithotomy (PNL) and parathyroidectomy for patients with HPT and stones.

Methods: Between December 2003 and October 2010, 8 patients underwent PNL /parathyroidectomy. All PNL were performed by one surgeon (JEL) as were all parathyroidectomies (RG). PNL was performed first (prone), followed by parathyroidectomy (supine).

Results: Table 1 reviews preoperative characteristics. All patients had serum-based evidence of HPT. In 6 (75%), adenomas were identified on sestamibi scan. In 2 (25%) the scan was indeterminate. Table 2 reviews intra-operative findings. Mean total OR time was 254.8 min (mean PNL 174 min, mean parathyroidectomy 80.9 min) and mean blood loss (EBL) was 128.2cc (mean PNL 117.4cc, mean parathyroidectomy 9.4cc). No intra-operative complications occurred during parathyroidectomy. In 1 (12.5%) patient, pus was found behind impacted stones and the procedure was terminated prematurely. Table 3 reviews postoperative results. Mean hospital stay was 2.5 days. Six (75%) patients required secondary PNL for residual stones. No patient required transfusion. Serum calcium normalized in all. Two postoperative PNL complications occurred (1 UTI, 1 pleural effusion requiring drainage). No postoperative parathyroidectomy complications occurred. To date, 1 (12.5%) patient required additional surgery for stones (basket extraction of ureteral stone).

Conclusions: Combined PNL and parathyroidectomy can be safely performed in patients with HPT and renal stones.

Table 1. MP-02.16

	Cyberwand (n=25, 13F, 12M)	Lithoclast Select (n=25, 12F, 13M)	StoneBreaker (n=25, 11F, 14M)	*p*-value
Median patient age (Years) (range)	55 (33–89)	55 (34–80)	58 (32–79)	NS
Median stone size (mm^2) (range)	451 (210–2557)	431 (182–1289)	360.16 (205–919)	NS, p=0.096
Median Clearance Efficiency (mm^2/sec)	24.21 (0–62.45)	27.16 (4.57–64.17)	22.64 (0–53.78)	NS, p=0.905
Stone Free Rates	48%	60%	52%	NS, p=0.75
Complications	Mixed respiratory and metabolic acidosis (1) confusion d/t narcotics (1)	Fever (1) Pleural effusion (1) hypotension in pacu (1), small perforation (1)	Pleural effusion (2) Bleeding (2) Small perforation (2) hypotension in pacu (1). Perinephric Hematoma (1) ureteral stent/ persistent leak at NT site (1)	NS

Table 1. MP-02-17. Preoperative Characteristics	
Male	1 (12.5%)
Female	7 (87.5%)
Mean age (years)	53 (28–79)
Mean years with stone disease	7.8 (0.16–25)
Number with prior stone surgery	5 (62.5%)
Mean preoperative Serum Calcium (mg/dL)	11.01 (10.1–11.9)
Mean preoperative Serum Phosphorus (mg/dL)	2.67 (1.7–3.2)
Mean preoperative Serum Parathyroid Hormone (PTH; pg/ml)	138.3 (101–172)
Mean preoperative Urine Caicium / Creatinine (mg/g)	258.8 (80–310)
Mean preoperative Serum Creatinine (mg/dL)	1.04 (0.5–1.5)
Mean preoperative Hemoglobin (g/dL)	11.7 (9.3–15.3)

Table 2. MP-02-17. Intra-operative results	
Number patients undergoing unilateral PNL	4 (50%)
Number patients undergoing bilateral PNL	4 (50%)
Mean total OR time (minutes)	254.8 (210–303)
Mean OR time PNL (minutes)	174 (120–210)
Mean # accesses / kidney	1.08 (1–2)
Mean OR time parathyroidectomy (minutes)	80.9 (44–140)
Mean Intra-operative PTH (pg/ml)	37.8 (14.3–70)
Mean total EBL (cc)	128.2 (25–260)
Mean EBL PNL (cc)	117.4 (20–250)
Mean EBL parathyroidectomy (cc)	9.4 (5–30)
Intra-operative complications PNL	1 (12.5%) – pus behind impacted stones
Intra-operative complications parathyroidectomy	0 (0%)

Table 3. MP-02-17. Postoperative results	
Mean length of hospital stay (days)	2.5 (1.5–3.5)
Mean postoperative day 1 Hb (g/dL)	10.4 (6.8–15.1)
Number patients requiring transfusion	0 (0%)
Mean postoperative day 1 Serum Creatinine (mg/dL)	1.3 (0.9–1.8)
Mean postoperative day 1 Serum Calcium (mg/dL)	8.6 (8.2–9.5)
Number patients requiring 2nd look procedure for residual stones during admission	6 (75%)
Postoperative complications PNL	2 (25%)
–Urinary Tract Infection	–1 (12.5%)
–Pleura Effusion	–1 (12.5%)
Postoperative complications parathyroidectomy	0 (0%)
Stone analysis	
–Mixed stone types	7 (87.5%)
–Calcium Phosphate (Hydroxyapatite)	5 (62.5%)
–Brushite	3 (37.5%)
–Calcium oxalate monohydrate (COM)	3 (37.5%)
–Calcium oxalate dihydrate (COD)	1 (12.5%)
–Carbonate Apatite	1 (12.5%)
–Ammonium Acid Urate	1 (12.5%)
Final pathology results of parathyroid specimen	
–Hypercellular adenoma	8 (100%)
Mean 1 month follow-up Serum Calcium (mg/dL)	9.2 (8.8–9.7)
Mean 1 month follow-up Serum Creatinine (mg/dL)	0.98 (0.5–1.2)
Mean follow-up Urine Ca / Creatinine (mg/g)	106.8 (75.8–144.4)
Number patients requiring additional stone surgery	1 (12.5%)

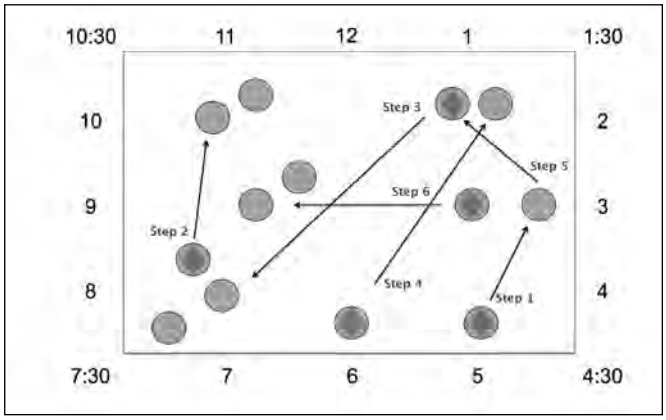

Fig. 1. MP-02.19.

MP-02.18

Shock Wave Lithotripsy Referral Patterns Changes Over a Decade at a Single Centre

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Introduction and Objectives: To assess the impact of the revised American and European Urological Associations guidelines (2007) on the referral patterns for Shock Wave Lithotripsy (SWL) at a single centre.

Methods: A retrospective review of prospectively collected SWL database was performed for consecutive patients referred for SWL at a tertiary stone centre between December 1999 and December 2010. A total of 7620 SWL treatments were included (3884 from Dec. 1999 till Dec. 2005, 1438 from Jan 2006 till Dec. 2007, and 2298 from Jan 2008 till Dec. 2010). The location of the original stone referred for SWL treatment was used for the present study.

Results: Left-sided stones were comparable in all groups (55.5%, 54.7%, and 53.2%, p=0.11). There was no significant difference among the three groups in terms of mean stone size (95%CI) [9.5 (8.4- 10.6), 9.0(8.8-9.2), and 9.7 (9.5-9.8), mm; p=0.37]. The proximal ureteral was the most common location prior to Dec 2005, whereas renal pelvis was the most common location after Jan 2006. There was a small but significant

Table 1. MP-02.18. The pattern of stone referral for SWL in the last 10 years

Stone location	From December 1999-December 2005	To December 2007	To December 2010	*p* value
Upper and mid poles	455 (11.7%)	203 (14.1%)	308 (13.4%)	0.03
Lower pole	785 (20.2%)	276 (19.2%)	433 (18.8%)	0.34
Renal pelvis	889 (22.9%)	336 (23.4%)	624 (27.1)	0.65
Proximal ureter	965 (24.8%)	299 (20.8%)	417 (18.1%)	0.006
Mid ureter	240 (6.2%)	102 (7.1%)	166 (7.2%)	0.82
Distal ureter	550 (14.2%)	222 (15.4%)	350 (15.2%)	0.34
Total	3884	1438 7620	2298	NA

NA: not available.

increase in the percentage of upper and mid-caliceal stones (11.7%, 14.1%, and 13.4%; p=0.03). Proximal ureteral stones treated with SWL significantly decreased over the study period (24.8%, 20.8%, 18.1%; p=0.006). Likewise, the proximal ureteral stones ¡Ý10 mm were significantly decreased over time (38.6%, 24.7%, 18.9%, p=0.003). In comparison with cases referred by urologists practicing more than 10 years, the number of cases referred by younger surgeons (<10 years of practice) was significantly lower in all groups (p<0.001) (Table 1).

Conclusions: There was a trend of decreasing referral of proximal ureteral stones for SWL over the study period. These findings suggests adherence of local urologists to the 2007 EUA/AUA guidelines on management of urolithiasis. The referral pattern for SWL was significantly decreased by the young urologist practising less than 10 years.

MP-02.19

On Screen Frame of Reference System and Standardized Communication Promotes Safe and Efficient Laparoscopic Teaching: a Three Armed Randomized Control Trial

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Introduction and Objectives: During laparoscopy, the staff surgeon often directs the trainee to points on a surgical field. Variability between verbal instructions may be a source of errors, confusion, and conflicts. To have a successful outcome, errors need to be minimized and communication clear. We developed a novel on screen frame of reference (FOR) system, coupled with standardized verbal commands to facilitate intra-operative teaching. The objective of this study was to determine the impact of two novel FOR systems used with a standardized language on performance of laparoscopic tasks when compared to standard techniques.

Methods: Sixty-three medical students were randomized to three groups. Group 1 (control) performed tasks with no overlay and simple commands (i.e. left, right, up and down). Group 2 performed tasks on an overlay with directions based on a clock/x:y triangulation (Fig. 1). Group 3 performed tasks on an overlay with an alphanumeric coordinate system. All subjects performed three different trials, consisting of object transfers, while instructed by one of the three methods. Time to task completion and error score recorded and analyzed using non-parametric statistics.

Results: Group 2 (69, 70, 56) was significantly faster than the control (86, 80, 71, p<0.05) as well as Group 3 (92, 85, 68, p<0.05) across all trials. Group 2 (0.94, 0.97, 0.26) had fewer errors than the control (1.43, 1.14, 0.81) across trials 1 and 3 (p<0.05) but similar error scores to Group 3 (0.68, 0.68, 0.23). Although Group 3 had similar time to completion to the control, there were statistically fewer errors (0.68, 0.68, 0.23, p<0.05).

Conclusions: Using a frame of referencing overlay and standardized communication for directing laparoscopy promotes safe and efficient endoscopic teaching. This data has helped validate the use of the first on screen, real time video overlay of a frame of referencing system for endoscopic monitors to improve teaching and patient safety.

MP-02.20

How Accurate Are Urologists at Estimating Lesion Size Endoscopically?

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Introduction and Objective: Cystoscopic and ureteroscopic estimates of lesion size can influence the urologistâ€™s therapeutic approach to the patient, but their accuracy has not been established. Our objectives were to assess the accuracy of endoscopic estimates of lesion size in urology using in vitro urinary tract models and to identify factors impacting this accuracy.

Methods: Rigid cystoscopy was carried out by eleven staff and nine learners in the Department of Urology on pig bladders containing papillary (ball bearings) and sessile (washers) lesions of various sizes. For each lesion, participants provided three size estimates: two using only the cystoscope in order to assess intra-observer agreement and the third with the aid of a ureteric catheter as a visual reference. Similar estimates were then made with a flexible ureteroscope on several papillary lesions within an inorganic urinary tract model. Welch two-sample and paired t-tests were used to assess differences in mean estimates and the intraclass correlation coefficient (ICC) was used to assess the agreement between repeat estimates.

Results: The mean errors in estimation did not differ with the level of endoscopic training for either cystoscopy or ureteroscopy regardless of lesion size and appearance, or the use of a visual reference. Staff and learners consistently underestimated lesion size with median errors ranging from 6% to 49% for cystoscopy and from 37% to 56% for ureteroscopy (top graphs). Participants demonstrated excellent (median ICC of 0.97) and fair (median ICC of 0.56) reproducibility of estimates with cystoscopy and ureteroscopy respectively (bottom graphs).

Conclusions: We demonstrate for the first time that urologic endoscopists substantially underestimate the size of observed lesions with both ureteroscopy and cystoscopy despite fair to excellent reproducibility of their estimates. This finding is independent of level of training, lesion characteristics, and the use of a visual reference.

Moderated Posters 3: Renal
June 26, 2012, 1240-1440

MP-03.01

Does the Method of Bladder Cuff Excision Affect Disease Recurrence after Nephrouretectomy for Upper Tract Urothelial Carcinoma? A Single-centre Comparison of Three Bladder Cuff Excision Methods

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Introduction and Objectives: The standard management of upper urinary tract urothelial carcinoma (UTUC) is radical nephroureterectomy (RNU) with bladder cuff excision (BCE). Multiple methods of BCE are possible. We investigated whether any of three methods of BCE used at our institution is associated with disease recurrence or metastases.

Methods: We performed a retrospective review of RNU at our institution. Three BCE methods were used: open extravesical, open intravesical via cystotomy, and transurethral incision (TUI) using an endoloop through a laparoscopic port to secure the distal ureter. We defined recurrence as any urothelial recurrence and metastases as disease recurrence outside the urothelium.

Results: From January 2001 to January 2011, 112 patients underwent RNU (110 laparoscopic, 2 open) with complete data. Sixty-one, 30, and 21 patients underwent TUI, extravesical, and intravesical BCE respectively. After a median follow-up of 22 months (range 0-113), 36 (32.1%) patients developed recurrences (bladder = 34, contralateral UT = 2) and 18 (16.1%) metastases. Recurrence rates were 26.7%, 38.1%, and 32.8% in the extravesical, intravesical, and TUI groups respectively (p=0.682). Factors associated with recurrence or metastases in a univariate regression analysis were a history of bladder cancer, smoking, positive margins, lymph node status unknown (compared to negative), and concomitant CIS. In a multivariate analysis, stage, positive margins, and CIS were associated. The method of BCE was not associated with oncologic outcomes.

Conclusions: These three methods of BCE appear to be equally oncologically valid. A limitation of this study is its retrospective design. Ideally, prospective studies are needed to best assess whether a particular method is superior, but the rarity of UTUC makes prospective studies unlikely. Multi-centre trials could further validate the various methods.

MP-03.02

Regional Differences in Practice Patterns and Associated Outcomes for Upper Tract Urothelial Carcinoma in Canada: Outcomes from the Canadian Upper Tract Collaboration

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Introduction and Objectives: We aim to delineate regional differences in practice patterns for upper tract urothelial carcinoma (UTUC) and relate these to patient outcomes.

Materials and Methods: A multi-institutional radical nephroureterectomy database was created with information on all patients treated with nephroureterectomy for UTUC between 1994 and 2009 from 10 academic centres in Canada. The centres were divided into three regions across Canada. Primary study variable was geographical region within Canada. Secondary study variables were time from diagnosis to surgery, open versus laparoscopic nephroureterectomy, management of the distal ureter, performance of lymphadenectomy and administration of chemotherapy and/or radiation therapy. Outcome measures were overall survival, disease-specific, and recurrence-free survival. Cox proportional multivariable linear regression analysis was used for analysis.

Results: There was a significant difference between the regions for time from diagnosis to surgery date (p=0.001), type of surgery (open vs. laparoscopic, p<0.01), and management of distal ureter (p=0.001) in 1029 patients. Multivariable linear regression analysis demonstrated that tumor location, stage, grade, and salvage radiation therapy were significant in association with overall survival.

Conclusions: There are practice pattern differences between regions within Canada. However, there is no association with a change in overall survival when demographic, clinical and pathological data are considered.

MP-03.03

Impact of Body Mass Index (BMI) on Outcomes of Patients with Upper and Lower Urinary Tract Cancers Treated by Radical Surgery: Results from a Canadian Multicentre Collaboration

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Introduction and Objectives: To evaluate the effect of body mass index (BMI) on outcomes after radical cystectomy (RC) and radical nephroureterectomy with bladder cuff excision (RNU) in a contemporary group of patients from a Canadian multicentre collaboration.

Methods: Data was collected from eight participating Canadian centres on patients who had undergone RC or RNU from 1998 to 2008. Patients without BMI data were excluded from analysis. Various clinico-pathologic parameters among the three subsets of patients (BMI <25 kg/m^2, 25-30 kg/m^2, >30 kg/m^2) were analyzed. Kaplan-Meier method was used to determine any difference in overall (OS), disease-specific (DSS), and recurrence-free survival (RFS) across the three distinctive weight classes. Multivariate analyses models were also constructed to assess the impact of BMI on survival.

Results: Data on BMI was available on 847 patients who had undergone RC as well as 664 patients who had undergone RNU. There was no difference in histology, pathologic stage, grade and margin status among the three subsets of patients undergoing either type of surgery. However, RC patients with lower BMIs (<25 kg/m^2) were significantly older, had more nodal metastasis and trended towards higher pathological stage while RNU patients with lower BMIs (<25 kg/m^2) were significantly older and received

less adjuvant chemotherapy compared to those with BMI >30 kg/m^2. After adjusting for different variables on multivariate analysis, BMI was not an independent prognostic factor for OS and DSS in both surgical groups. Although BMI >30 kg/m^2 was not associated with worse RFS in the RC group, it was associated with worse RFS in the RNU group.
Conclusions: Increased BMI does not seem to influence survival in patients undergoing RC. BMI >30 kg/m2 is associated with worse RFS in patients undergoing RNU.

MP-03.04

A Population-based Study of Surgeon Characteristics Associated with the Uptake of Contemporary Techniques in Renal Surgery

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Introduction and Objectives: Despite current evidence, we have witnessed a slow uptake of new standards in the surgical management of renal tumors. We sought to evaluate surgeon-level characteristics associated with the uptake of laparoscopy, partial nephrectomy (PN), and adrenal-sparing approaches in the surgical management of renal tumors.
Methods: Using the Ontario Cancer Registry, we identified surgeons treating renal cell carcinoma (RCC) in the province of Ontario, Canada, between the years of 2002 to 2004. We then classified individuals within this cohort as either high or low utilizers of laparoscopy, PN, or adrenal-sparing approaches. Further variables analyzed included academic status, surgeon graduation year, and surgical volume status. We then utilized univariable and multivariable logistic regression models to assess predictors of uptake.
Results: We evaluated 108 surgeons for their uptake of both laparoscopy and adrenal-sparing approaches and 94 surgeons for their uptake of PN. Regarding laparoscopy, we identified 32 surgeons (30%) as high users based on a cut-off of using laparoscopic approaches in at least 50% of their radical nephrectomies for tumors 7cm or smaller. Predictors of uptake of laparoscopy included graduation year after 1990 (OR 4.81, 95% CI 1.57-14.8) and high surgeon volume (OR 4.33, 1.60-10.4). We identified 41 surgeons (44%) as high users of PN based on a threshold of performing PN for >33% of their cases for T1a tumors. The only significant predictor of uptake of PN was academic status (OR 5.83, 1.96-17.3). We identified 69 surgeons (65%) as high users of adrenal-sparing approaches but did not identify any significant predictors for uptake in this group.
Conclusions: We identify unique factors contributing to the uptake of distinct surgical techniques in the management of RCC. This information sheds light on the underlying mechanisms and helps us understand how to further encourage the dissemination of these practices.

MP-03.05

Association between Comorbidity and Survival after Radical Nephroureterectomy: Results from the Canadian Upper Tract Collaboration

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Introduction and Objectives: The role of comorbidity as an independent prognostic factor for survival after radical nephroureterectomy (RNU) for upper tract urothelial cancer (UTUC) has not been studied. Here we examined the associations between comorbidity and survival outcomes.
Methods: Institutional radical nephroureterectomy databases containing detailed information on UTUC patients treated between 1994 and 2009 were obtained from 10 academic centres in Canada. Data were collected on 1029 patients and combined into a relational database formatted with patient characteristics, pathologic characteristics, and survival status. Comorbidity burden was classified as low (CCI ≤2) or high (CCI >2) using the Charlson Comorbidity Index (CCI). The outcomes were overall survival (OS), disease-specific survival (DSS), and recurrence-free survival (RFS). The Kaplan-Meier method and Cox proportional regression models were used to analyze survival data.
Results: Comorbidity data was evaluable for 322 out of 1029 patients (31%). The median follow-up duration was 2.5 years (IQR, 0.6 to 6.2 years). 101 (31%) and 221 (69%) patients had low and high comorbidity burden, respectively. The predicted 5-year OS (86% vs. 66%, log-rank p<0.01), DSS (89% vs. 76%, log-rank p=0.02), and RFS (62% vs. 42%, log-rank p<0.01) rates differed between patients with low and high comorbidity burden. Univariable Cox regression analysis showed that high comorbidity burden was associated with poorer OS (HR 2.45, 95% CI 1.43 to 4.17, p<0.01), DSS (HR 2.20, 95%CI 1.13 to 4.29, p=0.02), and RFS (HR 1.85, 95%CI 1.28 to 2.68, p<0.01). However, multivariable Cox regression analysis showed that comorbidity burden was not independently associated with OS (HR 1.74, 95%CI 0.80 to 3.81, p=0.160), DSS (HR 1.87, 95%CI 0.70 to 4.99, p=0.21), or RFS (HR 1.37, 95%CI 0.82 to 2.30, p=0.24).
Conclusions: Comorbidity burden was not independently associated with survival outcomes after RNU for UTUC.

MP-03.06

Ipsilateral Adrenalectomy at the Time of Radical Nephrectomy – Does It Impact Overall Survival?

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Introduction and Objectives: Despite current evidence supporting ipsilateral adrenal gland-sparing approaches during radical nephrectomy (RN), such practices remain underutilized. The long-term consequences of an iatrogenic solitary adrenal gland are poorly understood. We performed a population-level analysis to assess the impact of ipsilateral adrenalectomy on overall survival.
Methods: Using the Ontario Cancer Registry (OCR), we identified 1,651 patients in the province of Ontario, Canada with pT1a renal cell carcinoma (RCC) who underwent RN between1995 and 2004. We linked individual patient information with pathologic data from abstracted pathology reports and determined whether the ipsilateral adrenal gland was removed at the time of RN. We utilized univariable and multivariable (adjusting for age, gender, tumor size, and tumor grade) Cox proportional hazards models and Kaplan-Meier curves to assess predictors of overall and cancer-specific survival.
Results: The overall rate of ipsilateral adrenalectomy at the time of RN was 30%. Median follow-up for the cohort was 109 months. Adrenal removal was associated with worse overall survival; 10-year mortality 26% compared to 20% for those in whom the adrenal gland was left in situ. Factors predictive of worse overall survival on multivariable analysis were increasing age (hazard ratio (HR) 1.07 per year, CI 1.06-1.08), high-grade tumors (HR 1.38, 1.00-1.90), and having undergone ipsilateral adrenalectomy (HR 1.23, 1.00-1.50). Ipsilateral adrenalectomy was not predictive of cancer-specific survival (HR 1.18, 0.78-1.79).
Conclusions: We demonstrated a significant association between ipsilateral adrenalectomy and overall survival. Our findings further support the importance of adrenal-sparing approaches at the time of RN.

MP-03.07
Oncolytic Virotherapy Combined with Targeted Therapy for the Treatment of Renal Cell Carcinoma

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Introduction and Objectives: In the present study, we assessed the utility of combining sunitinib with reovirus (RV), an oncolytic virus that has been demonstrated to mediate both innate and adaptive anti-tumor immune responses in addition to its direct oncolytic effects.

Methods: In vitro, a panel of renal cell carcinoma (RCC) cell lines were treated with escalating doses of RV, sunitinib or a combination of these agents. Cytotoxicity, viral progeny and apoptosis was subsequently quantified by WST-1, plaque titration and TUNEL assays, respectively. Natural killer (NK) cell and cytotoxic T lymphocyte (CTL) migration towards reovirus infected cells was assessed utilizing 3µm pore transwell plates. Synergy was assessed via the Chou and Talalay method. In vivo, 8-9 week old Balb/c mice were inoculated with 2.5x106 RENCA cells subcutaneously to establish a syngeneic immunocompetent murine model of RCC and treated with RV (i.t or i.v), sunitinib (i.p) or a combination of these agents.

Results: RV replicated and induced a cytotoxic response in all tested cell lines (RENCA, 786-0, A498, ACHN). The addition of sunitinib to reovirus infected RCC cells lead to a synergistic cytotoxic response [CI <1] and did not effect viral replication. RV infection of RCC cells enhanced both NK and CTL migration relative to irradiated virus control. In vivo, intratumoral RV administration significantly decreased tumor burden and enhanced overall survival [177 vs. 44 mm^2, p=0.001]. The combination of sunitinib with intravenously delivered RV facilitated an enhanced anti-tumor effect relative to either agent used as a monotherapy.

Conclusions: Our results suggest that RCC is sensitive to RV oncolysis both in vitro and in vivo. Moreover, we have demonstrated that combination therapy with sunitinib enhances this therapeutic effect. To our knowledge, this is the first study to report these findings. Thus, our novel therapeutic strategy warrants further investigation for use against RCC.

MP-03.08
Clinical Role of the SWI/SNF Complex Gene PBRM1 in Clear Cell Renal Cell Carcinoma

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Introduction and Objectives: Recently, the SWI/SNF chromatin remodeling complex gene PBRM1 was identified as the second major cancer tumor suppressor gene in clear cell renal cell carcinoma (ccRCC), with mutations in 41% of cases. We have conducted a pilot study to assess the relationship of PBRM1 mutation on various clinicopathological parameters and outcome in ccRCC patients at the University Health Network.

Methods: Our cohort consisted of 20 patients who underwent surgery for ccRCC between 2005 and 2006, and who had consented to have tumor tissue frozen for future study. DNA was extracted from tumor and normal tissue and PCR performed using barcoded PBRM1 primers that covered the whole gene. 20 samples were pooled and processed with the Illumina Miseq sequencer. Mutations detected were confirmed by conventional sequencing. Associations between mutation and clinicopathological variables were tested using Fisher's exact and Wilcoxon rank sum tests. The association between PBRM1 mutation and time-to-progression was tested using the log-rank test; the progression-free survival was estimated using the Kaplan Meier method.

Results: PBRM1 mutations, including frameshift insertions and deletions and single nucleotide changes were seen in 14 (70%) of patients. Patients with the mutations were more likely to have a smaller tumor size and a low Fuhrman grade (p=0.05 for both). Also, the TNM stage distribution after treatment showed that patients with the mutation were more likely to have localized disease. Three (50%) of the patients without mutation and 4 (29%) of the patients with mutation had progressed by last visit. The 1-year progression free survival was 40% vs. 75% among patients without and with the mutation, respectively (log-rank p=0.25).

Conclusions: ccRCC patients with PBRM1 mutations may have a better natural history. Further studies with bigger samples are needed in order to confirm these findings. These are underway.

MP-03.09
Canadian Kidney Cancer Information System (CKCis): a Prospective Platform to Better Understand Outcomes of Patients with Kidney Cancer

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Introduction and Objectives: In the face of rapid evolution in treatment, outcomes of kidney cancer patients need to be reported with as little or no delay on as large a population cohort as possible. We present the development of a Canadian multicentre prospective database.

Methods: An evaluation of major kidney cancer databases in Canadian institutions was performed to obtain a baseline inventory. Twelve Canadian centres were then selected to participate in this project; each represented by a urologist and a medical oncologist Governance rules were developed and approved. Predefined research questions were formulated. Essential data needed to answer these research questions as well as future research questions was selected and approved by the group and appropriate data fields were created for the database. The eCancerCare platform was used to create a centralized database with a secure web access. An initial pilot phase was performed in five institutions. The project has now rolled out to all 12 centres.

Results: During the pilot phase, 428 patients were enrolled into CKCis. 104 (24.3%) patients underwent a biopsy in order to confirm histological diagnosis. Resection of the primary renal tumor was performed in 324 patients, 5 had thermal ablation and 5 underwent resection of metastasis. Systemic therapy was used in 60 patients. During this follow-up period, 2 patients died of their disease, 99 are alive with disease and the remaining group are alive with no evidence of disease. A total of 2658 imaging studies were performed in the follow-up of these patients.

Conclusions: The CKCis represents an important tool in the prospective and continuous evaluation of outcome for patients with kidney cancer. Its development will help strengthen collaboration between Canadian institutions and promote the development of kidney cancer research.

MP-03.10
Validation of a Partial Nephrectomy Bench Model Developed via a Novel Material Engineering Process

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Introduction and Objectives: We previously determined the mean tear strength and resistance of human kidneys and used this data to develop a high-fidelity partial nephrectomy model with similar tissue characteristics to that of a human. Here we aimed to test the validity of this new bench model.

Methods: A questionnaire evaluating face and content validity was distributed to urology staff, fellows and residents. The questionnaire assessed the utility of the model as a surgical education tool using a 5-point scale. It asked participants to score the anatomical representation of the kidney model and the cutting, suturing, knot-tying and tissue tearing characteristics compared to a human kidney. Participants' opinion of the model's value was assessed. Participant level of training and surgical experience were also collected.

Results: 20 participants assessed the model and completed the questionnaire (8 staff, 4 fellows, 5 senior residents and 3 junior residents). 18

participants (90%) agreed or strongly agreed that the model was a good representation of a human kidney and tumor and two (10%) participants were neutral in opinion. 16 (80%) agreed or strongly agreed that cutting the model was similar to that of human kidney tissue, 2 were neutral and 2 disagreed in opinion. The median suturing score (out of 5) on the model were as follows: needle insertion=4, needle driving=3.5, knot/tying=4 and tissue tear strength=4. Overall, 19 (95%) agreed or strongly agreed that the model would help in laparoscopic training and 15 (75%) thought the same for open surgical training. All would recommend use this model for resident training. There were no statistically significant difference ($p>0.05$) in responses between staff and trainees.
Conclusions: Our partial nephrectomy model engineered using actual measures of tear strength and resistance of a real kidney demonstrates good face and content validity. Both experts and novice felt that this model was realistic and had potential educational utility.

MP-03.11
Laparoscopic Partial Nephrectomy for ≥4 cm Renal Masses
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Introduction and Objectives: Laparoscopic partial nephrectomy (LPN) is frequently used for the management of cT1a renal masses. While data on safety and long-term oncological outcomes of LPN for T1a tumors is widely available, it is lacking for >T1a lesions. We report our experience with LPN for ≥4 cm renal masses from a Canadian tertiary centre.
Methods: Between January 2003 to July 2011, 53 consecutive LPN for ≥4 cm renal masses were performed. Demographic, pathological and clinical data were obtained from a prospective database.
Results: Mean patients age was 60 years (62% male). Median tumor size was 4.8 (4-11) cm. The median surgical time was 145 minutes, and the median estimated blood loss was 100 ml. The median WIT was 24 minutes. Four (7.5%) cases required conversion to open surgery. One case was converted to total nephrectomy for clinical and pathological evidence of T3 disease. Surgical margin was positive in one case (1.9%). Four (7.5%) patients developed a urine leak postoperatively managed with a ureteric stent. Four (7.5%) patients developed postoperative bleeding requiring selective angioembolization. The median hospital stay was 4 days. There was no statistically significant difference between preoperative and postoperative estimated glomerular filtration rate and mean arterial blood pressure, $p=0.5$ and 0.1, respectively.
Conclusions: LPN for ≥4 cm renal masses is a safe and feasible approach. The perioperative morbidity appears to be equivalent to other standard approaches. Although LPN for ≥4 cm is technically challenging, in well selected patients and in experienced hands, it has acceptable surgical outcomes with no impact in renal function or blood pressure.

MP-03.12
Defining Small Renal Masses "trifecta" after Laparoscopic Partial Nephrectomies
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Introduction and Objectives: Treatment decision for small renal masses (SRM) is getting more complex with the development of minimally invasive surgery techniques, the acknowledged importance of renal function (RF) and the well-established risk of death from RCC. While a number of studies have addressed separately the morbidity, the oncological and the renal function (RF) outcomes after partial nephrectomy (PN), the % of patients with a successful combination of the three outcomes (SRM trifecta) is unknown. The objective of this study was to define the % of patients fulfilling the SRM trifecta after laparoscopic PN (LPN) using different SRM trifecta definitions.
Methods: Between 2003 and 2008, 318 patients underwent LPN at CHUQ for a SRM. 179 met inclusion criteria. After data collection, we generated many definitions of SRM trifecta combining a number of oncological, RF and mordidity outcome criteria.
Results: Median patient age, ASA score, BMI, tumor size (mm) and preoperative eGFR were 59,2,28,25 and 83, respectively. Mean follow-up was 44 months. Using the following SRM trifecta definition: absence of recurrence, eGFR ≥60 at last follow-up and absence of ≥ IIIb Clavien-Dindo complications, 77.7% of patients achieved the SRM trifecta : 96.7, 83.2 and 96.1% achieved the oncological, RF and morbidity criteria, respectively. In univariate analysis, patients who reached trifecta were younger, had a smaller BMI, a better ASA score and a smaller tumor size ($p<0.05$). Using other definitions, between 20.7 and 98.3% fulfilled the trifecta.
Conclusions: After LPN, we show that long-term RF was the most frequent criteria responsible a patient's failure to achieve our proposed SRM trifecta. These results demonstrate that significant morbidity rarely occurs after LPN and that laparoscopic radical nephrectomy should not be justified based on morbidity or oncological outcomes. Moreover, we set the basis for SRM trifecta definitions in order to compare LPN success with other surgical approaches.

MP-03.13
Fuhrman Grade Does Not Improve the Discriminant Ability in Patients with Papillary Renal Cell Carcinoma
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Introduction and Objectives: Fuhrman grade (FG) categorizes renal cell carcinoma (RCC) into a four-tier grading system. Previous investigators suggested that FG is not applicable in the setting of papillary RCC (pRCC) for prediction of cancer-specific mortality (CSM). We tested this hypothesis in a national database.
Methods: We relied on the SEER database to identify an overall population of 4767 patients with papillary RCC who were treated with partial or radical nephrectomy between years 1988 and 2008. Univariable and multivariable Cox regression analyses for prediction of cancer-specific mortality (CSM)-free survival were fitted. The discrimination accuracy was calculated using the area under the curve (AUC). In addition to the conventional four-tiered FG system, we also assessed whether the 3-tiered FG system (I–II vs. III vs. IV) and the 2-tiered FG system (I–II vs. III–IV) may increase prognostic ability.
Results: The overall 5-year CSM-free survival rate was 91.2% (95% confidence interval: 90.1–92.4). In univariable analyses, FG II, III, and IV were associated with a 1.8- ($p=0.003$), 4.3- ($p<0.001$), and 16.0-fold higher rate of CSM than their FG I counterparts ($p<0.001$). Univariable AUC for FG (71.4%) was the third most informative after tumor size (AUC: 75.0%) and tumor stage (AUC: 74.0%). In multivariable analyses, FG II, III, and IV were associated with a 1.3- ($p=0.3$), 1.8- ($p=0.03$), and 3.5-fold higher rate of CSM than their FG I counterparts ($p<0.001$). The AUC for prediction of 5-year CSM after adjustment for all other covariates resulted in 85.3 vs. 84.3% with and without the consideration of FG (+1.0%). Similar AUC values were obtained regardless of the FG system used: 3-tiered, 84.9% vs. 84.9%, 2-tiered.
Conclusions: It appears justified to use FG in pRCC patients. Also, based on the lower predictive accuracy when the modified FGS were used, it appears justified to continue using the conventional FG model.

MP-03.14
Comparative Study for Carbonic Anhydrase-ix, Vascular Endothelial Growth Factor and Platelet Derived Growth Factor Receptor-alpha Immunohitochemical Expression in Renal Cell Carcinoma
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Introduction and Objectives: Approximately 60% of sporadic ccRCC cases harbor a mutated VHL gene. VHL gene is involved in the regulation of the hypoxia induced factor1-α (HIF1-α), dysregulation of this

pathway results in high expression of carbonic anhydrase-IX (CA-IX), vascular endothelial growth factor (VEGF) and platelet derived growth factor receptor (PDGFR-α) among other target proteins. Our objectives were to compare between the patterns of immunohistochemical (IHC) expression of CA-IX, VEGF and PDGFR-α in renal cell carcinoma (RCC) and evaluate their significance in relation to the different clinicopathological variables in ccRCC.
Methods: The clinical data of 50 patients with RCC who underwent either radical or partial nephrectomy in the Centre hospitalier de l'Université de Montréal were collected. A tissue microarray containing 150 cores representing the 50 patients was constructed. The specificity of the antibodies used was validated by Western blot technique. Scoring of the IHC staining was done by a pathologist.
Results: IHC staining for VEGF and PDGFR-α was cytoplasmic while for CA-IX it was membranous. We noted a significant difference in the IHC expression of CA-IX, VEGF and PDGFR-α between normal kidney tissue and RCC ($p<0.001$) while between ccRCC and papillary RCC, only CA-IX and PDGFR-α showed significant difference ($p<0.001$). In ccRCC, an inverse correlation was observed between the percentage of CA-IX + cells and the intensity of VEGF staining ($p=0.014$). Significant association was found only between CA-IX and Fuhrman nuclear grade and tumor size ($P= 0.049$, $p=0.001$ respectively) and between VEGF and stage ($p=0.035$).
Conclusions: In ccRCC, the IHC expression of CA-IX and VEGF are more correlated to the clinicopathological variables than PDGFR-α. Combining these biomarkers together could improve their correlation with clinical parameters and their potential prognostic ability.

MP-03.15

Percutaneous Renal Cryoablation: Results from a Prospective Study

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Introduction and Objectives: Management for small renal tumors is evolving; with minimally invasive surgery assuming a leading role. Within this field, cryoablation is one alternative in appropriately selected cases. Herein we report our experience with renal cryoablation.
Methods: Prospective data has been collected from August 2006 including patient demographics and tumor characteristics. Follow-up data includes radiologic surveillance by CT scans performed at 3 months and annually thereafter. Renal function and haemoglobin pre- and post-treatment are compared. Cancer specific survival and overall survival are reported.
Results: A total of 170 patients are included in the prospective study. Mean patient age is 64 years. Mean tumor size is 3.1 cm (range 2.0 to 5.9 cm). Pathology from biopsies include renal cell carcinoma in 77% of cases (62% clear cell, 9% chromophobe, 6% papillary and one wilms tumor), 9% oncocytoma and 14% missed or no biopsy performed. 8 patients (5%) required repeat treatment resulting in complete resolution for residual disease. Loss of enhancement/involution of tumor has been achieved in all other cases. Mean follow-up is 30 months (3-62 mo.). There was no significant difference between pre- and post-renal function and haemoglobin. There was one postoperative death on day 2. Two patients required blood transfusion for delayed bleeds. Cancer specific survival is 100% and overall survival is 97%.
Conclusions: Percutaneous cryoablation is a safe and effective form of definitive treatment in the evolving management of small renal masses.

MP-03.16

Contrast-enhanced Ultrasound for Follow-up after Radiofrequency Ablation of Small Renal Masses

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Introduction and Objectives: Radiofrequency ablation (RFA) is a treatment option for small renal masses (SRMs). Post-RFA imaging with contrast-enhanced computed tomography (CE-CT) or magnetic resonance imaging (MRI) is necessary to evaluate the success of treatment and to monitor for recurrence. Neither modality is optimal; CE-CT exposes patients to ionizing radiation and potentially nephrotoxic and immunogenic contrast, while contrast-enhanced MRI is costly and poses a risk of nephrogenic systemic fibrosis. Ultrasound, though minimally morbid, fails to delineate enhancement. Contrast-enhanced ultrasound (CE-US) is a new modality employing gas-filled microbubbles to visualize enhancement in real time. We compared the diagnostic accuracy of CE-US to CE-CT for post-RFA monitoring of SRMs.
Methods: This is a prospective partially blinded single-centre pilot trial. After RFA for SRMs, patients underwent standard monitoring with CE-CT at 3 and 6 months, and every 6 months thereafter. Patients underwent CE-US within 14 days of each CE-CT. Two radiologists interpreted CE-CT and CE-US independently; each was blinded to results of the alternate imaging modality. The diagnostic accuracy of CE-US and CE-CT were compared.
Results: 13 patients enrolled and underwent RFA for SRMs from January 2010-2012. After a median follow-up of 18 months, 2 patients had CE-CT evidence of tumor recurrence; in both of these patients, CE-US also demonstrated tumor recurrence as interpreted by a blinded radiologist. In the other 11 patients all CE-CT and CE-US were independently interpreted as negative for recurrence.
Conclusions: In this pilot trial, there was perfect concordance between CE-CT and CE-US in detecting recurrence after RFA of SRMs. CE-US may be a viable, low cost, minimally morbid alternative to CE-CT and MRI for monitoring after RFA of SRMs. Larger studies are needed to validate the results of this pilot study.

MP-03.17

Prophylactic vs. Selective Ureteral Stenting in Preventing Ureteric Complications Post Renal Transplant: A Retrospective Review

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Introduction and Objectives: The use of prophylactic ureteric stents to prevent vesicoureteric complications after renal transplantation remains controversial. At our centre prior to Sept. 2008, stents were placed when deemed necessary by the surgeon (selective), since then, stents were placed in all patients (prophylactic) undergoing transplantation. Our objective was to evaluate the role of prophylactic versus selective stenting in the development of postoperative ureteric complications.
Methods: A retrospective review of 588 patients who underwent renal transplantation from Jan. 2006-May 2011 was completed. The primary outcome was the rate of ureteral complication (development of ureteric obstruction or uretero-vesical anastomotic leak). Secondary outcomes were the rate of urinary tract infections (UTI) and forgotten stents (FS). Using the Chi square test, we compared our primary and secondary outcomes across the selective and prophylactic cohorts. Logistic regression was used to compare the two cohorts while adjusting for potential confounders.
Results: The selective cohort consisted of 258 patients and the prophylactic cohort 330 patients. The two groups were comparable for age and performing surgeon, but not for gender and donor type (live/deceased). Unadjusted analysis demonstrated that the prophylactic group had a significantly lower rate of ureteral complication compared to the selective group (2.7% vs. 9.3%, OR 0.27, $p=0.0006$). After adjusting for differences in gender and donor type, the prophylactic group was still associated with a lower risk of ureteral complication (OR 0.25, $p=0.0006$). There was no significant difference in the rate of UTIs (20.9% vs. 16.7%) and FS (4.2% vs. 3.9%) between the prophylactic and selective groups, respectively.
Conclusions: Our retrospective review found that prophylactic stenting significantly reduced the rate of postoperative ureteral complications compared to selective stenting, without an increase in UTIs or FS.

MP-03.18

Supplemental Hydrogen Sulphide Reduces Graft Inflammation and Modulates Inflammatory and Anti-apoptotic Gene Expression in Renal Grafts Transplanted Following Prolonged Cold Storage

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Introduction and Objectives: Ischemia and reperfusion injury (IRI) is inherent in organ transplantation and is detrimental to graft function and survival. Hydrogen sulphide (H_2S) is a newly characterized endogenous molecule shown to protect against ischemic tissue injury. We have previously demonstrated that H_2S treatment during prolonged cold organ preservation mitigates renal IRI and improves early graft function. The current study aimed to characterize specific mechanisms underlying these protective effects of H_2S.

Methods: Bilaterally nephrectomized Lewis rats underwent renal transplantation (RTx) with left kidneys obtained from syngeneic donors that were flushed, at the time of procurement, with either cold (4°C) UW solution (UW group) or cold UW solution + 150 µM NaHS (H_2S group) and stored for 24 hours at 4°C in the same solution. Sham operated rats were also followed. Renal grafts were obtained between post-RTx day 3 and 5 and were placed half in formalin and half stored at -80°C. Formalin specimens underwent immunohistochemical staining with antibodies against specific markers of neutrophils (myeloperoxidase; MPO) and macrophages (CD68). Renal grafts stored at -80°C were analyzed via qPCR for expression of pro-inflammatory genes (IFN-γ, TNF-α and ICAM-1) and anti-apoptotic genes (ERK-1 and ERK-2).

Results: H_2S treated renal grafts contained significantly fewer MPO-positive and CD68-positive cells compared to UW grafts, which had significantly greater numbers of both cell types compared to Sham ($p<0.05$). Relative expression of ERK-2 was significantly increased ($p<0.05$) in the H_2S group compared to UW, while ERK-1 was unchanged between groups. As well, expression of IFN-γ, TNF-α and ICAM-1 was markedly decreased in H_2S treated grafts compared to UW.

Conclusions: These apparent anti-inflammatory and anti-apoptotic effects of H_2S likely contribute to the overall mechanism by which H_2S protects against cold IRI during renal transplantation.

MP-03.19

Does Donor Side Affect Outcomes? A Comparison of Right versus Left Allografts in Deceased Donor Renal Transplantation

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Introduction and Objectives: In deceased donor renal transplantation, the right kidney with its short renal vein potentially poses a challenge of more difficult vascular anastomoses in the recipient, including the possible need to lengthen the renal vein with inferior vena cava or shorten and reconstruct the renal artery. To our knowledge, differences in allograft outcome based on donor side have not been previously reported. Our objective was to review all deceased donor transplants (DDRT) performed at our centre over the past 5 years to determine if allograft donor side is associated with a greater risk of vascular complication.

Method: A retrospective review of all DDRT performed from Jan. 2006-May 2011 was completed. Our primary outcome was graft loss secondary to a vascular complication. Secondary outcomes were the need for renal vein lengthening and arterial reconstruction. Primary and secondary outcomes were compared across left and right-sided allografts using the Chi square test.

Results: Of the 356 DDRT performed, 237 (66.6%) were right and 119 (33.4%) were left allografts. The right and left cohorts were comparable for age, surgeon and recipient operative side. There was no statistically significant difference in the rate of vascular complications resulting in graft loss between the right and left cohorts (3.8% vs. 1.7%). There was a significantly greater likelihood of renal vein lengthening in the right cohort (5.2% vs. 0%, $p=0.01$), but no difference in need for arterial reconstruction (18.2% vs. 24.8%) in the right vs. left cohorts, respectively.

Conclusions: Retrospective review of DDRT from our centre, which performs a high proportion with right allografts, showed no significant difference in the rate of vascular complications causing graft loss between right and left kidneys. Although technically more challenging, right allograft kidneys are not associated with greater risk of technical failure when performed in a high volume centre.

MP-03.20

Detrimental Effects of Prolonged Warm Renal Ischemia Reperfusion Injury Are Abrogated by Supplemental Hydrogen Sulphide: an Analysis Using Real-time Intravital Microscopy

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Introduction and Objectives: The expanding deficit of healthy kidney donors has led to a surge in the use of kidneys obtained from donors after cardiac death (DCD), which are associated with prolonged warm ischemia and reperfusion injury (IRI). Hydrogen sulphide (H_2S) has been demonstrated to mitigate short courses of IRI in various organ systems. We aimed to determine the protective role of supplemental H_2S in a murine prolonged warm renal IRI model using real-time intravital microscopy.

Methods: Lewis rats were subjected to 1h of ischemia and 2h of reperfusion during intraperitoneal treatment with PBS (IRI, n=10) or 150 µmol/L of H2S (IRI + H_2S, n=12) and compared to Sham (n=9). We assessed renal and hepatic function with serum creatinine, alanine aminotransferase, and aspartate aminotransferase. Intravital microscopy (IVM) was used to assess renal and hepatic microcirculation. Kidneys were analyzed via histology and real-time PCR for inflammation and apoptosis.

Results: Compared to Sham, serum creatinine rose to 72.8 ± 2.5 µmol/L in the IRI group but only to 62.8 ± 0.9 µmol/L with IRI+H_2S ($p<0.05$). The surge in alanine and aspartate aminotransferases with IRI was similarly decreased with H_2S supplementation. IVM revealed increased renal capillary perfusion, decreased leukocyte infiltration and decreased hepatic sinusoidal diameter with H2S+IRI. Histological and real-time PCR analysis revealed improved acute tubular necrosis and apoptosis scores as well as down-regulation of inflammatory cytokines IL2 and IFNG, and upregulation of anti-apoptotic genes BCL2, ERK1, and ERK2 following H_2S supplementation.

Conclusions: These findings are the first to show the real-time protective role of supplemental H_2S in prolonged periods of warm renal IRI through anti-inflammatory and anti-apoptotic effects. The protective effects of H_2S suggest potential clinical applications in both DCD models of renal transplantation and oncological practices requiring vascular clamping.

MP-03.21

En Bloc Adult Organ Transplantation

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Introduction and Objectives: Dual transplantation has been used to optimize the donor pool in kidney transplantation. Herein we describe and provide follow-up of a simplified technique permitting dual en-bloc (DEB) transplantation of adult organs using single in situ arterial and venous anastomoses.

Methods: Eighteen adult DEB transplants were performed at our centre between 2001 and 2009. Additionally, one en bloc kidney/pancreas transplant was performed in a recipient with limited arterial access for grafting. All donors satisfied expanded criteria donor (ECD) demographics. Adult

DEB implants had donor IVC connected to recipient external iliac vein and "Y" arterial interposition graft anastomosed to the recipient iliac artery. Ureters were conjoined prior to implantation as a single patch into the recipient bladder. Duodenum from the pancreatic allograft was connected to recipient jejunum.

Results: Mean follow-up was 20 months (range 1-96 months). Mean operative time was 206±57minutes in DEB renal transplants. Delayed graft function rate was 28%. At 12-months follow-up, mean serum creatinine was 157±69 µmol/L in evaluable DEB renal transplant recipients. Three year overall and graft specific survival were 89% and 78%. No intraoperative complications occurred. However, one delayed postoperative thrombosis occurred in a severely atherosclerotic arterial branch of one kidney from an ECD adult pair (2.6% of units). Ureteral complications occurred in 5% of transplants. In the en bloc kidney/pancreas recipient with inadequate left iliac arterial conduit, both organs functioned immediately, and 1 year serum creatinine was 96 µmol/L and HbA1c was 5%.

Conclusions: Adult dual en-bloc renal transplantation is safe and effective. By employing techniques used to conjoin organ vasculature ex vivo, the number of in situ anastomoses is reduced, minimizing operative ischemic time and potential for complications associated with extensive dissection. Furthermore, contralateral vascular conduits are spared for potential future use.

MP-03.22

Maximal Kidney Length Predicts Need for Native Nephrectomy in Patients with Autosomal Dominant Polycystic Kidney Disease Undergoing Renal Transplantation

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Introduction and Objectives: Native nephrectomy (NX) in patients with sutosomal fominant polycystic kidney fisease (ADPKD) is performed on a case-by-case basis. Relative indications include: recurrent infections, pain, bleeding, space requirements for transplantation. The purpose of our study was to determine if kidney size can be used to predict need for NX (pre-, post-, or concomitant with transplantation).

Methods: We performed a retrospective analysis of all ADPKD patients who underwent renal transplantation (TX) at our centre between January 2000 and March 2010. Maximal and mean kidney length, kidney length:patient height ratio, predicted kidney weight: patient weight ratios, body mass: kidney mass index ratios were assessed for ability to predict need for NX. Kidney size was obtained from pre-TX imaging reports and corroborated with post-NX surgical pathology reports. Size parameters were assessed for their potential predictive ability by way of ROC curve analysis.

Results: Sixty-nine patients met our inclusion criteria, of which 15 (22%) underwent native NX within a mean of 1.15 years (95%CI 0.56 – 1.74) of TX. No significant differences were found between demographic variables of the NX and Non-NX groups. Maximal kidney length predicted need for NX to a greater degree than any other parameters. The median kidney length in the NX group was 25.0 cm (95%CI 21.0 – 30.0), while the corresponding length in the Non-NX group was 19.6 cm (95%CI 18.5 – 20.1) (p=0.001). An ROC curve analysis revealed an AUC of 0.772 (95%CI 0.665 – 0.864) (p<0.0001). A criterion of <25 cm revealed Specificity of 79.6% (95%CI 66.5 – 89.4) and Sensitivity of 40.0% (95%CI 16.3 – 67.7) for NX, while a criterion of <19.1 cm revealed a Specificity of 100% (95%CI 78.2 – 100.0) and a Sensitivity of 44.4% (95%CI 30.9 – 58.6) for Non-NX.

Conclusions: Maximal kidney length in patients with ADPKD is associated with eventual need for native NX and may be of clinical use in risk stratification.

MP-03.23

Risk Stratification and Management Strategy for Undetected Thrombophilia in Pediatric Renal Transplant Recipients

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Introduction and Objectives: Vascular thrombosis is responsible for 4-8% of renal transplant graft loss in children. No accepted, standardized pre-transplant thrombophilia workup or post-transplant management regimen exist.

Methods: All pediatric renal transplant patients listed since 10/2005 were evaluated for hypercoagulability risk factors using the following thrombophilia panel: Protein C level and activity, Protein S level and activity, PT20210A Mutation, Lupus Anticoagulant Panel (repeated twice), Factor V Leiden Deficiency, MTHFR gene Mutation, Homocystinemia, and Elevated Factor VIII. Based on these studies, patients were classified as low, moderate, high or no risk for thrombosis and post-transplant anticoagulation was determined (Table 1).

Results: Between 2005 and 2011, 64 pediatric renal transplant patients were evaluated. 15 underwent transplant prior to initiating a thrombophilia protocol. 49 underwent thrombophilia workup and were stratified based on these results. Of those, 40 have gone on to receive a kidney transplant and 9 remain listed. 13 were stratified high risk, 5 moderate risk, 27 low risk, and 4 no risk. The most common thrombophilia abnormality was MTHFR gene mutation (44%) which differs from patients in DVT studies where the most common mutations are Factor V Leiden Deficiency and PT20210A Mutation. Prior to initiating the protocol, 3/15 (20%) transplant recipients experienced a vascular thrombosis complication. Since initiating the protocol, 0/40 recipients have experienced a thrombotic complication, there was one hematoma requiring exploration in the protocol group.

Conclusions: Thrombophilia screening and anticoagulation treatment can prevent adverse vascular events. A high rate of thrombophilia was unmasked in this group of pediatric end-stage renal disease patients. Using a standardized workup and a prophylaxis regimen protocol, a lower complication rate of thrombosis was seen.

Table 1. MP-03.23

Risk Level	Risk Category	Thrombophilia	Management
High Risk	1	Personal H/o Thrombosis Evidence of Thrombophilia (other than MTHFR)	Postoperative Heparin Therapeutic LMWH (6 mos)
Moderate Risk	2	Evidence of Thrombophilia (other than MTHFR)	Postoperative Heparin Therapeutic LMWH (3 mos) Prophylactic LMWH (3 mos)
Low Risk	3	MTHFR Hyperhomocystinemia	Prophylactic LMWH (3 mos)
No Risk	4	No evidence of Thrombophilia	No Treatment

Moderated Posters 4: Voiding Dysfunction
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MP-04.01
The Role of Dutasteride in Preventing BPH Clinical Progression in Asymptomatic Men with an Enlarged Prostate

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Introduction and Objectives: Prostatic enlargement is a risk factor for acute urinary retention (AUR), need for surgery, as well as developing lower urinary tract symptoms (LUTS). Treatment with 5-alpha reductase inhibitors has been studied in men with moderate-severe LUTS[1-3]. Our study aims to assess the role of dutasteride in preventing clinical progression in asymptomatic men with larger prostates.

Methods: Using data obtained from the REDUCE study, we assessed the outcomes of men with a prostate size >40 mL and baseline International Prostate Symptom Score (IPSS) <8. Men treated with any medications for benign prostatic hyperplasia (BPH) at time of study entry or who did not complete the end-of-study IPSS questionnaire were excluded. We compared the risk of BPH clinical progression at four years between those randomized to dutasteride versus placebo. BPH clinical progression was defined as a >4 point worsening on IPSS, AUR related to BPH, urinary tract infection, or BPH related surgery. A multivariable logistic regression analysis (MVA) assessed the effect of dutasteride on BPH clinical progression adjusting for age, IPSS, prostate volume, post-void residual, and peak urinary flow rate.

Results: Our study cohort consisted of 1617 men; 825 on placebo, 792 on dutasteride. A total of 464 patients (29%) experienced BPH clinical progression; 297 (36%) on placebo, 167 (21%) on dutasteride (p<0.001). The relative risk reduction (RRR) was 44% and the absolute risk reduction was 15%. Among the 76 patients (4.7%) who had AUR and the 46 patients (2.8%) who had BPH-related surgery, the RRR for dutasteride was 79% and 81%, respectively. On MVA, dutasteride significantly reduced BPH clinical progression with an odds ratio of 0.47 (95%CI 0.37-0.59, p<0.001).

Conclusions: This study is the first to explore the benefit of treating asymptomatic or mildly symptomatic men with enlarged prostates. In this cohort, dutasteride significantly decreased the incidence of BPH clinical progression.

MP-04.02
Comparison of Ultrasound and Fluoroscopic Imaging for Urodynamic Assessment of Non-neurogenic Voiding Dysfunction in Males

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Introduction and Objectives: Ultrasonography is becoming an attractive modality in the assessment of voiding dysfunction. The goal of this study was to compare imaging findings of ultrasound and fluoroscopy in the urodynamic assessment of non-neurogenic male voiding dysfunction.

Methods: Males requiring urodynamic investigation for non-neurogenic voiding dysfunction were prospectively recruited. All patients underwent urodynamics using both fluoroscopy and ultrasound imaging. Fluoroscopy was performed during filling and voiding phases. Ultrasound study was performed on a SonoSite Titan ultrasound machine using a 5-2 MHz convex transducer. Transabdominal ultrasound was performed to image the bladder and kidneys during the filling phase. Intravesical protrusion of the prostate (IPP) and anterior bladder wall thickness measurements were carried out at a bladder volume of 200 ml. Imaging findings were compared with urodynamic results.

Results: 160 male patients (age 27 to 92, mean 66.3 yrs) were studied. Of the 160 patients, 13 were unable to void and 10 had poor visualization of the prostatic urethra on fluoroscopy. 84 patients were urodynamically diagnosed with bladder outlet obstruction (BOO). Receiver Operating Characteristic plot (ROC) analysis demonstrated that IPP was predictive of BOO (AUC=0.90, p<0.0001) whereas bladder wall thickness measurement was not predictive of BOO (AUC=0.61, p=0.05). IPP cutoff of 8.5 mm had a sensitivity of 83% and specificity of 91% for BOO in men. All patients with IPP of >12.5 mm were obstructed. 2 patients with sphincter active voiding were diagnosed fluoroscopically.

Conclusions: Ultrasonography is a feasible alternative imaging modality in urodynamic assessment of non-neurogenic male voiding dysfunction. Ultrasonographic IPP was predictive of BOO in our study. The role of IPP warrants further investigation.

MP-04.03
Does Independently-interpreted Retrograde Urethrography Accurately Diagnose and Stage Anterior Urethral Stricture Disease?

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Introduction and Objectives: The retrograde urethrogram (RUG) is an essential tool in the preoperative evaluation of anterior urethral strictures. This study aims to assess the accuracy and adequacy of RUG interpretation between the primary physician performing the procedure and the independent physician interpreting the films.

Methods: A retrospective review was performed on a cohort of 397 patients undergoing anterior urethroplasty over a seven-year period. Preoperative RUG findings (stricture presence, location, and length) as reported by both the primary physician performing the urethrogram and the independent interpreter were abstracted from the medical records. This data was compared to the gold standard of intra-operative stricture location and length. RUG adequacy was defined as comment on the presence, location, and length of urethral stricture.

Results: Only 49% (196/397) of independently-reported RUG studies were deemed adequate and 87% of independently-reported studies correctly diagnosed the presence of a stricture. When assessing stricture location, 49% of independently-reported studies correctly identified the location of the stricture compared to 96% of primary physician-reported cases (p<0.001). The mean stricture length reported by the independent observer was 3.23 cm compared to 4.18 cm by the primary physician and 4.56cm intra-operatively. The differences between independently-reported, primary physician-reported, and intra-operative lengths were all statistically significant (p<0.001). Upon linear regression analysis, the independently-reported length showed a 0.47 R2-coefficient of correlation to the intra-operative length (p<0.001) compared to a 0.93 R2-coefficient of correlation between the primary physician-reported length and the intra-operative length (p<0.001).

Conclusions: Our study suggests that independently-reported RUGs are neither adequate nor accurate for use in preoperative staging of anterior urethral stricture.

MP-04.04

Do Cuff Size/Reservoir Size Impact Erosion, Revision, Infection and Outcome Rates in Patients Who Underwent AUS Placement for Stress Urinary Incontinence after Primary Treatment for Prostate Cancer

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Introduction and Objectives: Urinary incontinence is a common complication after radical prostatectomy and radiation therapy (RT). The AUS (artificial urinary sphincter) is considered the gold standard for patients who develop urinary incontinence post prostatectomy or after RT for prostate cancer (PC). We compared AUS done at our institution for urinary incontinence status post PC treatment and their complication rate. We looked at, if cuff size and reservoir size made a difference in terms of erosion, infection , revision and dryness at follow-up.

Methods: A retrospective database review was conducted of 54 patients who underwent AUS placement for stress urinary incontinence after primary treatment for PC between June 2002 to April 2011. Patients were divided based on cuff size and size of reservoir. This data were then compared with respect to erosion, infection, revision and dryness at follow-up.

Results: Total no. of erosions, infections, revisions were 13%, 13% and 33.3%. When these results were stratified based on cuff size small (4 cm≤) vs. normal, then: infection 23.5% vs. 7.4%, p=0.186, erosion 18.8% vs. 11.1%, p=0.655, revision rates 41.2% vs. 28.6%, p=0.348 and dry at follow-up 66.7% vs. 73.7%, p=0.704. When these results were stratified based on pressure of reservoir 51-60 vs. 61-70, then: erosion 23.1% vs. 9.5% p=0.348, infection 30.8% vs. 4.5%, p=0.052, revision 38.5% vs. 30.4%, p=0.624, dry at follow-up 25% vs. 13.3%, p=0.589. Subanalysis evaluated the effect of prior RT on: erosion 18.2% vs. 15.4% p=1.000, infection 41.7% vs. 8% p=0.025, revision 33.3% vs. 40.7% p=0.734, dry at follow-up 73.7% vs. 28.6% p=0.069.

Conclusions: We found that cuff size did not make a difference on any parameters studied. If a smaller pressure reservoir was used, the rates of infection were lower, which was statistically significant (SS). Prior RT was a factor in increased infection rates which was SS and being dry at follow-up which approached SS. Patients who underwent RT, had smaller cuff size or a smaller pressure reservoir tended to have worse outcomes.

MP-04.05

The Sphincter Sum: a Practical and Effective Tool for Evaluating Patients with Post-prostatectomy Incontinence

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Introduction and Objectives: The AdVance Male Sling (American Medical Systems, Minnetonka MN) has become an established treatment option for post-prostatectomy incontinence. To our knowledge the optimal preoperative selection criteria for this procedure have yet to be defined. We describe the sphincter sum as a cornerstone of our current selection process for this procedure and correlate with subjective surgical outcomes.

Methods: A retrospective chart review of 80 consecutive male sling patients was performed. The external urinary sphincter in all patients was evaluated preoperatively with flexible cystoscopy. Based on level of coaptation, presence of scars and degree of fixation, we assigned a score from 1 (completely fixed open) to 5 (appears normal) at rest and with active contraction. The two scores were totaled to give the sphincter sum which ranges from 2 – 10. Patients were categorized into 2 groups for comparison, those with "optimal" features (sphincter sum >8) and those with "adverse" features (sphincter sum ≤7). A telephone survey was performed with questions about degree of improvement, pad use, quality of life (QOL) pre and postoperatively.

Results: 65 of 80 subjects responded to the telephone survey and were included in the study. 44 patients had "optimal" sphincter features while 21 had "adverse" features. The subjective success rate was significantly higher in the "optimal" group, 89% vs. 62% (p= 0.024). The subjective dry rate was also significantly higher in this group, 64% vs. 33% (p= 0.03). Patients with sphincter sum >8 reported significantly lower levels of ongoing pad use and significantly lower levels of QOL impairment from residual incontinence.

Conclusions: The best results with the AdVance male sling are realized in patients with sphincter sum >8 indicating a high degree of residual external urinary sphincter function. We find the sphincter sum to be an effective tool for evaluating prospective patients for this procedure.

MP-04.06

Revision Urethroplasty for Recurrent Urethral Stricture: a Comparative Analysis of Efficacy and Outcomes

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Introduction and Objectives: Urethroplasty is a cost effective treatment of urethral stricture with 5-year stricture-free rates over 80%. What to offer patients with failures after urethroplasty remains a question. The purpose of this study is to compare clinical factors, type of urethroplasty, and patency rates in revision compared to urethroplasty naïve patients.

Methods: Retrospective analysis of 541 urethral reconstructions performed by a single surgeon from Aug '03 to Mar '11 was done. Age, stricture length, location, etiology, comorbidities, previous intervention and type of surgery performed were examined. The primary outcome was cystoscopic urethral patency with secondary measures of bothersome LUTS, UTI or chordee. Statistical analysis was Fischer's, Chi-squared, and unpaired t-test when appropriate.

Results: 466 (86.1%) patients met our criteria and had complete follow-up. 96 (20.6%) patients had a previous urethroplasty. Revision patients had longer strictures (6.0 vs. 4.6 cm, p<0.0001), occurred with increased frequency in the penile urethra (57.3 vs. 7.8%,p<0.0001) and were more often associated with Lichen sclerosus (23.5 vs. 8.6%, p<0.01). Revision patients were significantly more likely to undergo a staged procedure or urethrostomy-based procedure (47.9 vs. 4.3%, p<0.0001). Patency did not significantly differ between repeat and naïve urethroplasties (92.8 vs. 93.5%, p=0.9). Patients with revision experienced more chordee (13.4 vs. 1.9, p<0.0001), but did not differ significantly in occurrence of UTI (4.1 vs. 2.7%, p=0.32) or bothersome LUTS (8.2 vs. 10.8%, p=0.6).

Conclusions: Revision urethroplasty is an effective treatment option for recurrent stricture after urethroplasty. Patency rates are gratifying (92.8%) and comparable to urethroplasty naïve patients. Patients presenting for revision are more likely to have longer strictures, strictures in the penile urethra or lichen sclerosus. Patients undergoing revision urethroplasty experience higher rates of chordee.

MP-04.07

Primary Realignment versus Suprapubic Cystostomy for the Management of Posterior Urethral Distraction Defects: a Systematic Review and Meta-analysis

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Introduction and Objectives: The early management of posterior urethral distraction defects associated with blunt trauma is controversial. Options include primary realignment (PR) and suprapubic cystostomy (SPC). Early realignment may reduce stricture incidence, but some authors have raised concerns regarding increased rates of impotence and incontinence. A systematic review was conducted to compare PR with SPC for the management of posterior urethral distraction defects with regards to rates of stricture, impotence, and incontinence.

Methods: Two electronic databases (MEDLINE and EMBASE) were searched with the assistance of a librarian. Title, abstract, and full text screening was carried out by 2 independent reviewers, with discrepancies resolved by consensus. Narrative reviews, surveys, and historical articles were excluded. Only studies reporting a direct comparison of PR versus SPC for management of posterior urethral distraction injuries associated with blunt trauma in adults were included. Quality assessment of the included articles was performed in duplicate. Stricture incidence was evaluated for all included studies, as were impotence and incontinence rates when reported. All outcomes were treated as dichotomous data with calculation of odds ratio, and were pooled using a random effects model with Review Manager 5.1.

Results: Our comprehensive search yielded 161 unique articles. Nine papers were included in the meta-analysis. Stricture rate was significantly lower in the PR group (OR = 0.15, 95%CI 0.04 to 0.55, $p<0.01$). There was no significant difference between the two interventions with regards to impotence (OR = 1.19, 95%CI 0.73 to 1.92, $p=0.49$) or incontinence (OR = 0.75, 95%CI 0.38 to 1.48, $p=0.41$).
Conclusions: PR appears to reduce the incidence of stricture formation following posterior urethal distraction defect associated with blunt trauma, as compared to SPC, without increasing rates of impotence or incontinence.

MP-04.08

The Mesh Wallstent (UroLume) in the Treatment of Detrusor External Sphincter Dyssynergia in Men with Spinal Cord Injury

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Introduction and Objectives: To evaluate the long-term efficacy and safety of the UroLume stent for the treatment of detrusor sphincter dyssynergia (DSD) in spinal cord injured (SCI) patients.
Methods: Twenty-four spinal cord injured patients with neurogenic bladder and DSD associated with high detrusor pressures and incomplete emptying on preoperative video-cystometrograms (VCMG) were retrospectively reviewed. 11 patients were on clean intermittent catheterization (CIC) and 13 with indwelling Foley's catheter. All patients underwent Urolume stent insertion according to standardized protocol. Postoperative patient and physician satisfaction, complications and re-obstruction rates were also analyzed. Paired t-test is used and p value <0.05 was taken as significant.
Results: The mean follow-up was 4.1 (2.5-11) years. The mean age was 46 (33-58) years. 87.5% had a cervical level injury. The mean duration of neurological disability prior to intervention was 9.2 (2-25) years. None of the patients had previous sphincterotomy. The mean postoperative stay was 3.7 (1.8-5.6) days. Mean time for removal of suprapubic tube was 28.7 (11.3-26.1) days. Mean residual volume was 502 (281-923) ml before treatment, 260 (14-530) ml ($p<0.02$) at 3 months, 260 (47-473) ml ($p<0.03$) at 1 year, and 270 (92- 448) ml ($p<0.03$) at 10 years. There was a 55% decrease in incidence of autonomic dysreflexia at 1 year, and among 11 patients with autonomic dysreflexia preoperatively, 4 (36%) patients continued to complain of mild, and 1 (9%) of severe dysreflexia at one year postoperatively. None of the patients required an indwelling catheter or CIC at 1 year, however 20.8% required either an indwelling catheter (4 patients) or CIC (one patient) at 5 years due to poor bladder emptying. The overall complication rate was 54%.
Conclusions: The treatment of DSD in SCI patients with Urolome stent is safe and effective. However, common complications were observed including the need for re-stenting.

MP-04.09

Surgical Treatment of Male Incontinence Using the Argus Male Sling: Our First Five-Case Experience

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Introduction and Objectives: Male incontinence, often as a result of prior prostate therapies such as radical prostatectomy, TURP, radiotherapy, or cryotherapy, affects quality of life. Pad costs, social isolation and negative body image are just some of the detrimental effects of incontinence. Recently, the Argus Male Sling has come to Canada and we report our first 5 cases performed in Calgary.
Methods: All five patients received urodynamics, cystoscopy and preoperative assessment with 24 hr pad testing, questionnaires (IPSS, ICIQ-UI, UDI-6), and a nursing visit. On a single day, all 5 patients underwent implantation of the Argus sling. Operative times, postoperative course including hospital stay, clinic visits and nursing calls were all recorded. At this time, the preoperative data and postoperative data up to 1 month was available.
Results: All 5 had prior radical prostatectomy. 1 man had a prior male sling procedure. The average age was 69.6 yrs. No significant change in PVR was recorded at 1-month (preop: 35.6 and 1 month: 69.6 cc). No change in voided volume was noted but the peak flow did drop from 21.2 cc/sec to 9.6 cc/sec. Degree of bother as scored on the IPSS moved from 4 preop to 0.8 postoperative ICIQ-UI dropped from 13 to 3.6. UDI-6 dropped from 10 to 3.4. Preoperative 24 hr pad weight was 5.6 oz and postoperative 0 oz (no pads used). 3 patient required in and out catheter postoperative and perineal pain was the most common complaint.
Conclusions: The Argus male sling is a new device to Canada. At the time of preparation, our 1 month data supported its role in the treatment of male incontinence. Improvements in incontinence, degree of bother, and pad usage were excellent. We report our experience with this device to review our own outcomes and provide data and guidance to other urologists considering the Argus male sling in the management of male stress incontinence.

MP-04.10

A Potential Gold Standard for Reconstruction of Long Segment Bulbar Urethral Strictures - Intermediate Outcomes of the Dorsal Onlay Augmented Anastomosis with Buccal Mucosa Graft

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Introduction and Objectives: Long segment bulbar urethral strictures remain somewhat of a reconstructive dilemma. Endoscopic procedures alone have poor outcomes and generally, these strictures are not amenable to anastomotic repair; thus tissue transfer is typically required. The objective of this study is to assess the intermediate-term results of a dorsal onlay "augmented anastomosis" using buccal mucosa to reconstruct long segment bulbar urethral strictures.
Methods: 164 patients prospectively underwent open reconstruction for long segment bulbar urethral strictures from Nov. 2003 to Jan. 2011. Buccal mucosa graft and dorsal onlay "augmented anastomosis" was utilized in all cases. Preoperatively, all patients underwent urethrography and flexible cystoscopy. Mean stricture length was 4.9 cm (range 3-12 cm). All patients were followed up with flexible cystoscopy and subjective symptom assessment at 6 and 12 months, with annual symptom assessments thereafter. Mean length of follow-up was 3.0 years. Stricture recurrence was defined as a segment <16 Fr caliber on cystoscopy, or intractable obstructive voiding symptoms.
Results: Postoperative complications included post-void dribbling (41.5%), urinary tract infection (3.7%), ejaculatory dysfunction (3.1%), transient orchalgia (10.4%), and donor site morbidity (4.3%). 96.3% (158/164) of patients had no evidence of cystoscopic stricture recurrence on follow-up. Six patients underwent direct vision internal urethrotomy for recurrence postoperatively and 5 are stricture free, ranging from 16 months-8 years post urethrotomy.
Conclusions: To date, this series represents the largest cohort of patients reconstructed with this technique. This 96.3% stricture free rate on cystoscopy will continue to be analyzed in the long-term. Using a buccal mucosa graft with a dorsal onlay "augmented anastomotic" repair yields excellent mid-term results and shows promise as a potential gold standard for reconstruction of long segment bulbous urethral strictures.

MP-04.11

Effect of Baseline Characteristics of Subjects with Overactive Bladder on Changes in Daytime and Nighttime Urgency Urinary Incontinence Episodes Following Antimuscarinic Treatment

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Introduction and Objectives: We assessed whether clinical and demographic characteristics are predictive of antimuscarinic efficacy for daytime and nighttime urgency urinary incontinence (UUI) episodes.

Methods: Subjects ≥18 y with overactive bladder (OAB; ≥1 UUI episode, ≥8 micturitions per 24 h) were randomized to receive the maximum approved doses of fesoterodine (FESO; 8 mg), tolterodine extended release (TER; 4 mg) or placebo (PBO) in a 2:2:1 ratio in two 12-week, double-blind, head-to-head trials. Subjects in the FESO group received 4 mg/d during the first wk and 8 mg/d thereafter. All subjects completed 3-day bladder diaries at baseline and wk 12. In a post hoc analysis of data pooled from these trials, changes from baseline to wk 12 in daytime and nighttime UUI episodes/24 h were analyzed using ANCOVA models including significant baseline values as covariates; treatment, study, country, gender, age, BMI, and prior antimuscarinic treatment (yes/no) as factors; and two-way interaction terms with treatment. Only subjects with daytime or nighttime baseline UUI >0 were included in the respective analyses.

Results: Greater baseline UUI severity was predictive of increased antimuscarinic efficacy for both daytime and nighttime UUI episodes. Age, prior antimuscarinic treatment and symptom bother also significantly predicted efficacy on both daytime and nighttime UUI. FESO 8 mg (n=1498) was more efficacious than TER 4 mg (n=1515) in reducing daytime UUI episodes in the overall population and in subjects with higher baseline UUI severity; there were similar trends for nighttime UUI episodes (FESO n=897; TER n=909).

Conclusions: Baseline UUI severity, age, prior antimuscarinic treatment, and symptom bother were predictive of antimuscarinic efficacy for both daytime and nighttime UUI episodes.

MP-04.12

The Selective b3-Adrenoreceptor Agonist Mirabegron Is Effective and Well Tolerated in Patients with Overactive Bladder Syndrome

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Introduction and Objectives: The efficacy and tolerability of mirabegron in a Phase III trial of patients with OAB in Canada and the United States are presented.

Methods: This 12wk, multicentre, randomized, double blind, parallel-group, placebo-controlled trial enrolled patients >18yrs with symptoms of OAB for >3mos. Patients who completed a 2wk, single-blind, placebo run-in, and experienced >8 micturitions/24h and >3 urgency episodes (with or without incontinence) over a 3 day micturition diary period during screening, were randomized to receive placebo or mirabegron 50 or 100mg once daily for 12wks. Co-primary endpoints were the changes from baseline to final visit in the mean number of incontinence episodes and micturitions/24h. Efficacy was assessed according to patient micturition diaries and safety assessments included adverse event (AE) reporting.

Results: 1328 patients were randomized and received study drug (placebo n=453; mirabegron 50 mg n=442; mirabegron 100mg n=433). Both mirabegron groups demonstrated statistically significant improvements compared with placebo in the coprimary and secondary efficacy endpoints at 4 and 12 wks. The incidence of treatment-emergent AEs was similar across the placebo and mirabegron 50 and 100 mg groups (50.1, 51.6 and 46.9%, respectively). The most commonly reported (>3%) AEs in any treatment group were hypertension (6.6, 6.1 and 4.9%, respectively), urinary tract infection (1.8, 2.7 and 3.7%), headache (2.0, 3.2 and 3.0%) and nasopharyngitis (2.9, 3.4 and 2.5%). The incidence of serious AEs was 2.0, 2.5 and 3.2%, and discontinuation rates due to AEs were 3.8, 4.1 and 4.4%, respectively.

Conclusions: In this study, mirabegron demonstrated statistically significant improvements in key OAB symptoms and was well tolerated in patients with OAB.

MP-04.13

Open-label, Ascending Dose Cohort Study of LiRIS (lidocaine-releasing intravesical system) in Women with Moderate to Severe Interstitial Cystitis

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Introduction and Objectives: LiRIS is a novel intravesical drug-delivery system which releases therapeutic amounts of lidocaine into the bladder over 2 weeks. This phase 1b open-label, ascending dose cohort study evaluated the tolerability, safety, efficacy and limited pharmacokinetics of LiRIS in women with moderate to severe IC.

Table 1. MP-04-12. Efficacy results: adjusted mean* (standard error) change from baseline

	Placebo	Mirabegron 50 mg	Mirabegron 100 mg
Co-primary endpoints			
Number of incontinence episodes/24h at final visit	-1.13 (0.112)	-1.47† (0.114)	-1.63† (0.117)
Number of micturitions/24h at final visit	-1.05 (0.132)	-1.66† (0.133)	-1.75† (0.135)
Key secondary endpoints			
Volume voided/micturition at final visit	7.0 (2.41)	18.2† (2.44)	18.0† (2.47)
Number of incontinence episodes/24h at Wk 4	-0.72 (0.116)	-1.20† (0.119)	-1.18† (0.122)
Number of micturitions/24h at Wk4	-0.77 (0.127)	-1.19† (0.129)	-1.37† (0.131)

*Least squares mean adjusted for baseline, gender and geographical region ; $p<0.05$ versus placebo † with and ‡ without multiplicity adjustment.

Methods: 18 women with IC, meeting NIDDK criteria, having baseline bladder pain of at least 4 (0-10) were enrolled at 4 Canadian centres. Patients received either LiRIS 200 mg (cohort 1) or LiRIS 650 mg (cohort 2) for 2 weeks. LiRIS safety, efficacy, cystoscopic appearance of bladder pre-and post- LiRIS, and limited PK were collected.
Results: Both LiRIS 200 mg and LiRIS 650 mg were well tolerated. Clinically meaningful reductions were seen in pain (VAS 0-10 scale -4.9 for 200 mg; -3.6 for 600 mg), urgency (VAS 0-10 scale -6.5 for 200 mg; -3.5 for 600 mg), voiding frequency (-7 episodes per day) and disease questionnaires (ICSI 0 0-20 scale -5.4 for 200 mg; -4.5 for 600 mg). Cystoscopic exam showed improvement on Day 14 (LiRIS removal) compared with Day 1 (LiRIS insertion) including resolution of Hunner's lesions in 6 of 7 patients with baseline lesions. Global Response Assessment (7-item scale) showed an overall responder rate of 69% at Day 14 which was maintained with an overall responder rate of 69% two weeks later (Day 28). Extended follow-up suggests the pain response was maintained to Day 60. The adverse events were typical of those seen in patients with IC and consistent with a cystoscopic procedure. The majority of adverse events reported were mild to moderate in intensity with no LiRIS related serious adverse events. The systemic levels of lidocaine were very low; no adverse events were attributable to lidocaine exposure.
Conclusions: LiRIS 200 mg and LiRIS 650 mg was safe, well tolerated and showed preliminary efficacy including mucosal healing and extended duration of effect in patients with moderate to severe IC.

MP-04.14

Noninvasive Diagnosis of Painful Bladder Syndrome / Interstitial Cystitis Using Near Infrared Spectroscopy

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Introduction and Objectives: Painful bladder syndrome/interstitial cystitis (PBS/IC) is defined as a syndrome of urgency, frequency, and suprapubic pain in the absence of positive urine culture or obvious bladder pathology. Diagnosis of PBS/IC is currently based on clinical judgment of treating urologist after ruling out other urinary pathologies, using invasive cystoscopic and urodynamic (UDS) studies. One potential etiology of PBS/IC is bladder mucosa inflammation associated with abnormal angiogenesis and ulcerative lesions in bladder mucosa. Near infrared spectroscopy (NIRS) is a noninvasive optical technique to monitor tissue oxygenation and hemodynamics. The purpose of this study was to examine ability of NIRS to differentiate subjects identified as PBS/IC from other marked bladder conditions.
Methods: Twenty-four patients with lower urinary tract dysfunction were devided into 2 groups, PBS/IC (4 male aged: 27.5±8 yrs) and non-PBS/IC (8 male and 12 female aged: 47.7±4.8 yrs) after standard diagnostic investigations. Detrusor oxygen saturation percentage (TSI%), a direct index of tissue metabolism, were studied in all subjects using a NIRS instrument, simultaneous to UDS study. After one minute baseline measurement in supine rest position with empty bladder, the detrusor TSI% was recorded by the NIRS that was placed and fixed over the bladder. Statistical difference of the detrusor TSI% values between two groups were studied.
Results: Mean resting values of detrusor TSI% were significantly different (p<0.0005) between 2 groups (74.2%±4.9 in PBS/IC vs. 63.6%±5.5 in non-PBS/IC).
Conclusions: Noninvasive NIRS interrogation of the bladder demonstrated significant increase in detrusor oxygen saturation in patients diagnosed as PBS/IC. This observation may support previous reports that indicated bladder mucosa inflammation associated with abnormal angiogenesis and ulcerative lesions in bladder mucosa as the main etiology of the PBS/IC. This study presents potential application of SR-NIRS for noninvasive diagnosis of PBS/IC.

MP-04.15

Monitoring of Lower Urinary Tract Function in Patients with Spinal Cord Injury Using Near Infrared Spectroscopy

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Introduction and Objectives: : One of the most important conditions where there is loss of normal bladder function is spinal cord injury (SCI). Currently, evaluation of bladder function is limited to periodic invasive urodynamic testing (UDS). The purpose of this study was to assess the feasibility and usefulness of near-infrared spectroscopy (NIRS) in monitoring bladder function in patients with SCI during bladder filling and emptying and to investigate the correlations of NIRS measures with simultaneous UDS parameters. NIRS is a non-invasive optical method to study tissue oxygenation, hemodynamics and function by monitoring changes in the chromophore concentrations of oxygenated (O_2Hb), deoxygenated (HHb) and total hemoglobin (tHb).
Methods: 10 adult paraplegic patients with neurogenic bladder dysfunction who were referred for regular urodynamic evaluation were recruited. Changes in O_2Hb, HHb and tHb, and tissue saturation index (TSI%) in the detrusor were monitored and recorded by a wireless NIRS system during the urodynamic evaluation. Time points of urgency and urinary leakage were marked and patterns of change in NIRS parameters were compared to standard urodynamic pressure tracings.
Results: Strong consistency between changes in NIRS-derived tHb and changes in intravesical pressure were observed during filling across the subjects. During bladder filling a gradual increase in O_2Hb and tHb with minimal changes in HHb was observed. Interestingly, a drop in TSI% was detected seconds before strong urgency and urinary leakage.
Conclusions: Our preliminary data suggest a relationship between non-invasive NIRS measures and UDS parameters during bladder filling in SCI patients.

MP-04.16

The Signal Transduction of Skin Electrode Can Launch on the Bladder of Diabetic Rabbits and Ameliorate Its Hypomotility

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Introduction and Objectives: Vesica and urethra dysfunction caused by the damage of vesical peripheral nerve below spinal neuron is known as peripheral neurogenic bladder (PNB). The patients of PNB mainly present hypocontraction and over dilatation of bladder and even uroschesis. So we investigate if the signal of skin electrode can be conducted to bladders of diabetic rabbits and improve their vesical hypomotility.
Methods: 30 of male New Zealand rabbits were randomly divided into Group DM (diabetes mellitus, induced by alloxan) and Group C (control). Four weeks after modeling, saved rabbits (9 in Group DM and 10 in Group C) were stimulated by skin electrode on the projection area of bladder with three levels of exporting voltage (5.84V, 8.00V, 11.00V) to observe changes of vesical signals and pressure.
Results: The total attenuation percentage of signals was 99.88% (SD=0.00%) in Group C, and 99.93% (SD=0.00%) in Group DM. Although attenuation percentage (AP) within each group did not depend on the strength of exporting voltage (EV), AP in Group DM was larger than that in Group C (p<0.01). Received vesical signals increased with the strength of EV (p<0.01), and were all weaker in Group DM than in Group C (p<0.01) when EV were the same in both groups. Meanwhile, vesical pressure of rabbits in both groups increased with vesical signals (p<0.05), and were all smaller in Group DM than in Group C (p<0.01). Linear correlation existed between vesical pressure and signals with a coefficient of 0.869 (p<0.01) in Group C and 0.750 (p<0.01) in Group DM.
Conclusions: Signals from skin electrode could be conducted to bladder to increase vesical pressure after significant attenuation in both Control group and DM group, so this could be used as the therapy of hypodynamic PNB such as diabetic cystopathy due to its non-invasion and effectiveness.

MP-04.17

Cost-effectiveness of Sacral Neuromodulation in Refractory Overactive Bladder: A Canadian Perspective

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Introduction and Objectives: A significant number of patients with refractory overactive bladder (OAB) and urgency incontinence will fail conservative treatment with optimized medical therapy (OMT) and may benefit from minimally invasive procedures including sacral neuromodulation (SNM) or botulinum toxin (BonT-A) injection. The goal of this study was to estimate the cost-effectiveness of SNM vs. OMT and BonT-A.

Methods: An economic Markov model with Monte Carlo simulation was used to assess the incremental cost-effectiveness ratio (ICER) of SNM vs. BonT-A and OMT. The model calculated the ICER in deterministic (base-case) and probabilistic (sensitivity) analysis from a provincial payer's perspective over a 10-year time horizon with 9-month Markov cycles. Other utilization data were acquired from recent publications and from an expert panel of 7 Canadian surgeons. Cost data were derived from provincial health insurance policy, drug benefit formulary, and hospital data.

Results: The annual (year 1-10) incremental Quality-Adjusted Life Years (QALY) for SNM vs. BonT-A was 0.05-0.51 and SNM vs. OMT was 0.19-1.76. The annual incremental cost of SNM vs. BonT-A was $7,237 in year-1 and -$9,402 in year-10 and was between $8,878 to -$11,447 vs. OMT. In the base-case deterministic analysis, the ICER for SNM vs. BonT-A and OMT were within the acceptable range ($44,837 and $15,130 respectively) at the second year of treatment, with SNM being dominant in the consequent years. In the base-case analysis the probability of ICER being below the acceptability curve (Willingness-To-Pay = $50,000) in Canada was >99% for SNM vs. BonT-A at year 3 and >95% for OMT at year 2.

Conclusions: SNM is a cost-effective treatment option for the management of patients with refractory OAB when compared to BonT-A and OMT. From a Canadian payers' perspective, sacral neuromodulation should be considered as first line treatment option in patients with refractory overactive bladder.

MP-04.18

Sacral Neuromodulation Failures

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Introduction and Objectives: Sacral neuromodulation (SNM) is a validated treatment option for refractory voiding dysfunction. It does not work for all patients, and/or there can be complications that require its removal. There are no studies examining the status of patients who have had a sacral neuromodulator removed. The goal of this study is to examine the current treatment(s) and quality of life of patients who have had a sacral neuromodulator removed. Reasons for device removal and attitudes towards SNM will also be described.

Methods: Patients treated by SNM in Halifax between the years of 1995-2008 by a single urologist were identified. 96 patients had a sacral neuromodulator placed for refractory voiding dysfunction and of these, 22 patients subsequently had the device removed. There were no exclusion criteria. Reasons for device removal, current treatments, and attitudes toward SNM were assessed by chart review and questionnaire answers. Current quality of life was assessed by the ICIQ-LUTSqol questionnaire.[1]

Results: A 45% participation rate (10/22) was achieved. Reasons for device removal were device pain (7), and lack or loss of effect (3). Subsequent treatments are ileocystoplasty (2), urinary diversion with cystectomy (3), oral anticholinergics (4), opioid analgesics (3) or observation (2). Average score on the ICIQ-LUTSqol questionnaire was 53 out of 76 (range 22-65), with an average bother score of 6.7 out of 10 (range 0-10). When asked if they would consider SNM again, responses were "yes" (5), "maybe" (2), and "no" (3).

Conclusions: Sacral neuromodulation offers a less invasive option for patients with refractory voiding dysfunction. However, patients should be counseled about the possibility for device complications necessitating removal. Many of these patients are subsequently treated by more invasive surgical interventions, yet continue to have a poor quality of life. Many patients would consider trying SNM again.

MP-04.19

A Cost-effectiveness Analysis of Tension-free Vaginal Tape vs. Burch Colposuspension for Female Stress Incontinence

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Introduction and Objectives: Stress urinary incontinence (SUI) represents a common and debilitating problem among adult women. Multiple methods to treat SUI exist, including the commonly performed tension-free vaginal tape (TVT) and Burch colposuspension (BC). In this study, we sought compare the cost-effectiveness (CE) of TVT to BC for treating SUI.

Methods: A Markov decision model was created to simulate treatment of SUI with TVT vs. BC. Of note, primary failure with TVT or BC was treated with a second TVT. Costing data were obtained from the Medicare Resource Based Relative Value Scale (RBRVS). Data regarding the success of TVT vs. BC were obtained from the peer-reviewed literature, as were corresponding utilities for different continence states. Sensitivity analyses (SA) were performed. The model was evaluated using Treeage Pro 2011 software (Treeage Software Inc., Williamstown, MA).

Results: At 10 year follow-up, TVT was more cost-effective (CE=85.27) than and dominated BC (CE=117.96, Table 1). Sensitivity analysis demonstrated that TVT was more cost-effective than BC irrespective of cost of procedure but that if the probability of success after TVT fell below 67%, then BC would become the more cost-effective strategy (CE=118.02 vs. 120.72).

Conclusions: Our study demonstrated that TVT was more cost-effective than BC as a treatment for female SUI. The clinical effectiveness of the two treatments impacts their CE more than their respective procedural costs. These results should be validated and confirmed in large, prospective trials.

Table 1. MP-04.19

Category	Effectiveness (QALY)	Incremental effectiveness (QALY)	Cost ($)	Incremental cost ($)	Incremental cost/incremental effectiveness ($/QALY)	Avg CE ($/QALY)
TVT	5.79	0.00	$493.45	0	0	85.27
Burch colpsuspension	5.78	-0.01	$681.93	$188.48	-32957.53	117.96

QALY: quality adjusted life-years; TVT: tension-free vaginal tape.

MP-04.20

Urinary Tract Mesh Erosion Following Female Pelvic Surgery

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Introduction and Objectives: Synthetic mesh is commonly used in the treatment of stress urinary incontinence (SUI) and pelvic organ prolapse (POP). Mesh erosion into the urinary tract is a rare but serious complication. The purpose of this study was to describe the management of mesh erosion into the urinary tract and to report the outcomes of a large cohort at our tertiary centre.

Methods: A retrospective review of women presenting to our centre between 2003-2011 with mesh erosion into the urinary tract was completed. Data was recorded and analyzed using SPSS version 15.0™.

Results: Forty patients (mean age = 57) presented with erosion into the bladder (n=16, 40%) and/or urethra (n=24, 60%). Mesh erosion was a result of SUI surgery in 85% of patients and POP surgery in 15%. Mean time from mesh insertion to diagnosis of erosion was 72.4 mos (3-360mos). Twenty percent had undergone a previous attempt at mesh removal. Mesh erosion was treated with cystoscopy +/- laser (n=12), transvaginal excision (n=17), and open retropubic surgery (n=7). One patient refused treatment and 3 were pending surgery at the time of this review. Ten patients (25%) required more than one surgery to remove mesh. Twenty-three patients (57.5%) had recurrent SUI and 12 (30%) required surgery to correct recurrent SUI (pubovaginal sling with rectus abdominis fascia). Of these, one was repeated and 66.7% were successful (i.e. no SUI). Patients with urethral erosion were more likely to develop recurrent SUI than those with bladder erosion, (p=0.012). Overall, 52.5% had voiding dysfunction at last follow-up. Mean follow-up was 16.1 mos from diagnosis of erosion and 12.2 mos from mesh removal.

Conclusions: This is the first report of a large cohort of patients with mesh erosion into the urinary tract. Mesh erosion results in increased morbidity requiring surgery to remove mesh and often surgery to correct recurrent SUI. Voiding dysfunction is common following treatment of mesh erosion.

MP-04.21

Long-term Outcomes of Pessary Use in Women with Pelvic Organ Prolapse

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Introduction and Objectives: The main objective of this retrospective study is to evaluate whether long-term use of vaginal pessaries is an appropriate conservative treatment for women with pelvic organ prolapse (POP).

Methods: From 1998 to 2010, 429 women with POP had a pessary trial. A pessary maintenance regime was chosen at one-month follow-up, and additional visits were then scheduled yearly. Data collected included information concerning pessary use, incidence of vaginal erosions or other associated morbidities, and subjective satisfaction rate.

Results: Average age at presentation was 71.1 ± 9.7 years old. 62% (n=258) of women had a successful pessary trial, defined as a one-month use of the pessary with subjective improvement of symptoms and no significant complication. Median duration of pessary use was 35 months (1-136). The satisfaction rate was 96%. Pessary self-maintenance regime, compared to maintenance by nurses, was associated with a prolonged pessary use (p=0.021). The overall erosion rate was 16%. Multivariate analysis demonstrated that erosions are associated with older age (p=0.011), constipation (p=0.018), and use of topical estrogen (p=0.001). The severity of vaginal atrophy increased with older age (p<0.001) and older patients were therefore more likely to use topical estrogen cream p<0.001). Both the severity of vaginal atrophy and intensive estrogen treatment before pessary trial were associated with a higher rate of erosions (p<0.001 and p=0.04). 66% (n=170) of women who underwent a successful pessary trial are still using a pessary.

Conclusions: Vaginal pessaries appear to be an appropriate treatment option for troublesome POP. These results show that patient's satisfaction is excellent. Regular maintenance and follow-up are essential, especially as the occurrence of vaginal erosions is difficult to predict. Erosions do not seem totally preventable by the use of topical estrogen.

MP-04.22

Management and Outcomes of Complex versus Simple Female Urethral Diverticula

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Introduction and Objectives: Urethral diverticula (UD) are an uncommon presentation in urology, and their diagnosis and management can be challenging. Misdiagnosis and/or ineffective treatment can lead to significant complications. While appearing as small benign cystic masses, many UD can be larger and more complex, completely encircling the urethra. Complete excision of these may require mobilization of the urethra from under the pubis, and more challenging closure of the urethra. This study evaluates the management and outcomes of these complex cases.

Methods: A retrospective review of all patients presenting with UD between 2002 and 2011 was carried out. Complex cases were defined as those requiring circumferential dissection around the urethra, and those recurring after prior excision attempts.

Results: 21 cases were available for review, and of these 12 (57%) were considered complex. Mean follow-up was 17.5 weeks. 11 cases were complex based on being circumferential, and 2 were recurrences. Presentation, management and outcomes are detailed in Table 1. In the complex group, 6 (50%) had preoperative stress incontinence (SUI), and 2 of these had fascial slings placed at the time of surgery. Of the remaining 4 patients, 2 had persistent SUI postoperatively. No recurrences, voiding dysfunction, or fistulae have been observed.

Conclusions: Many patients presenting with urethral diverticula are found to have complex masses completely encircling the urethra. These cases require more extensive dissection to achieve complete excision, and tissue interposition is often required. The risk of de novo SUI is low, and for patients with pre-existing SUI the decision to perform concomitant sling placement must be individualized as it is not always necessary.

Table 1. MP-04.22. Presentation, Management and Outcomes of Simple Versus Complex Urethral Diverticula

	Simple (9)	Complex (12)
Age (mean)	41.7	42.8
BMI (mean)	28.1	30.2
Preoperative SUI	0	6 (50%)
Operative time (median; min)	83 (40–120)	180 (120–480)
Martius flap	0	12 (100%)
Catheter duration (mean; days)	3	6.3
Concomitant sling	0	2 (16.7%)
Postoperative de-novo SUI	1 (11.1%)	0
Postoperative persistent SUI	n/a	2 (33.3%)
Complications	0	Hematoma and wound dehiscence (1), transfusion 2 units PRBCs (1), labial skin blister (1)

BMI: body mass index; SUI: stress urinary incontinence; PRBCs: packed red blood cells.

MP-04.23

Developing a Multi-disciplinary Lower Urinary Tract Centre: the vesia [Alberta Bladder Centre] Experience

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Introduction and Objectives: To deal with waitlists for lower urinary tract care, we have created vesia [Alberta Bladder Centre], a multi-disciplinary team composed of urology, uro-gynecology, pelvic floor physiotherapy, specialized family practitioners and nursing. Patients are triaged within the centre to see the earliest available appropriate care provider.

Methods: A review of the first year (2011) of practice at vesia [Alberta Bladder Centre] was conducted using all available sources of data. All practitioners share a common electronic medical record (EMR). Every patient encounter including phone calls is captured and available for review. The patient visits include: office visits, uroflow studies, ambulatory urodynamics, nursing assessments, pelvic floor physiotherapy. Visits to our website (vesia.ca) will also be captured since its launch.

Results: In 2011, 9434 patient visits were logged at vesia. 3498 patients were seen by a provider other than a urologist. Wait-list time for an office appointment with an urologist dropped from 9 months on average for most benign conditions to 2 months. Two specialty-trained primary care physicians working completed 910 patient encounters, while 359 assessments were performed by our "in house" pelvic health physiotherapist. Our full-time RN recorded 1830 patient encounters in 2011, including uroflow studies, urodynamics, teaching sessions and postoperative assessments. As a result, our in-hospital urodynamics wait-list fell from 10 months to 1 – 2 months within the first 6 months of opening.

Conclusions: vesia [Alberta Bladder Centre] is a new model to treat lower urinary tract disorders. In our first year of operation we were able to provide an additional 3498 patient assessments beyond our usual capacity as solo urology practitioners. The focus on patient education through websites, patient handouts, and on-site nursing care, and the ability to triage patients to the most appropriate practitioner makes this an attractive model.

Moderated Posters 5: Pediatric Urology
June 26, 2012, 1450-1600

MP-05.01
Impact of Side of Allograft Placement and Location of Arterial Anastomosis on Delayed Renal Function after Pediatric Renal Transplantation

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Introduction and Objectives: It has been suggested that renal allograft vascular reconstruction is easier to perform in the right iliac fossa rather than the left because of a more superficial orientation and relatively simpler exposure of the iliac vessels. Our goal was to compare the impact of side and location of the arterial reconstruction on early graft function.

Methods: Medical records of 95 children who underwent renal transplantation between 2006-2011 were retrospectively reviewed. Demographics, warm ischemia time, side and location of vascular anastomosis, nadir and time to reach nadir creatinine were captured.

Results: Mean age at the time of transplantation was 10.5 years (17 months-17years). Out of 95 transplants (63 males-32 females), 54 (56.8%) were cadaveric and 41 (43.2%) were living-related. In 73 cases (76.8%), the graft was placed on the right side vs. 22 (23.2%) on the left. On the right side, the kidney was anastomosed to the external iliac artery (EIA), common iliac artery (CIA) and Aorta (Ao) in 16.5% (n=12), 69.8% (n=51) and 13.7% (n=10) respectively; with a similar distribution on the left side: 22.8% (n=5) to EIA, 68.2% (n=15) to CIA and 9% (n=2) to Ao. Mean ischemia time was 10 minutes longer on the left side compared to the right (47.5 vs. 38.3 minutes, p=0.003). However, this was not associated with statistically significant differences on time to reach nadir creatinine (p=0.32) and mean nadir creatinine (p=0.11). When patients were grouped by location of the anastomosis, there was no difference in warm ischemia time, mean time to nadir creatinine and mean of creatinine nadir (p>0.05).

Conclusions: We found a significant increase in the warm ischemia time when the kidney was transplanted on the left side. Although these findings suggest a more challenging vascular anastomosis on this side, longer warm ischemia time was not associated with delayed renal function. Overall, location of arterial anastomosis did not have any impact on renal function outcomes.

MP-05.02
Minimally Invasive Open Technique for Management of Upper Pole Ectopic Ureter in Children with Duplicated Systems

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Introduction and Objectives: Duplex systems with upper pole ectopic ureters may be associated with an increased incidence of urinary tract infections, urinary incontinence, hydroureteronephrosis, and vesicoureteric reflux (VUR). Surgical management options are aimed at reducing these complications. Distal ureteroureterostomy (U-U) is one such modality which is minimally invasive yet relatively under-utilized. We report our prospective analysis with this technique.

Methods: Since 2009, we have prospectively followed all children who underwent distal ureterouretostomy (U-U) for upper pole ectopic ureters associated with a duplex collecting system and no VUR. Age at surgery, operative time, postoperative complications, length of surgical incision and hospital stay, as well as time to resolution of hydroureteronephrosis were analyzed. One surgeon stented all anastamoses whereas the other did not based on their routine practice without any selection bias. All cases were performed through a small transverse inguinal incision.

Results: U-U was performed on 17 patients with a median age at surgery of 13 months (1-60). Median followup was 12 months (6-27). Mean operative time was 87 min (70-115). One patient required readmission after discharge for febrile urinary tract infection with stent migration outside of the urethra. Another child returned to hospital for severe stent colic. Mean postoperative hospital stay was 18 hours. One patient spent 4 days in hospital for a presumed viral infection. All patients showed complete resolution of their hydroureteronephrosis. Time to resolution of hydroureteronephrosis was 5 months (3-9). No complications were observed in children who had stentless U-U.

Conclusions: Distal U-U via a small inguinal incision is an effective minimally invasive option for management of ectopic upper pole ureters without lower pole VUR. It can be performed on an outpatient basis in most patients. Nonstented patients fared well with no complications.

MP-05.03
Observation versus Immediate Intervention in Ureteropelvic Junction Obstruction: Does It Matter?

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Introduction and Objectives: Ureteropelvic junction syndrome is a common cause of antenatal hydronephrosis. Controversy exists over the indications for pyeloplasty, as well as its timing and renal functional outcome. The objective of this study is to assess whether a period of observation with selective intervention adversely affects ultimate renal function as compared to early pyeloplasty.

Methods: Retrospective review of patients diagnosed with unilateral severe high-grade antenatal hydronephrosis (SFU 3 or 4) between 1998 and 2008 was performed. Children were categorized into those who received pyeloplasty based on the initial evaluation (early) versus those that underwent a period of observation with later pyeloplasty due to functional deterioration (delayed). All patients received an initial postnatal MAG-3 renal scan postnatally, and at least one more postoperatively. The main outcome variable is percent renal function of the affected kidney. Statistical analysis used T-test to assess for differences between groups, and bivariate analysis to determine if surgical timing had an effect on ultimate renal function.

Results: One hundred fifty three patients were identified with unilateral severe antenatal hydronephrosis. Of these, 77 children underwent pyeloplasty [45 immediate, 32 delayed]. Mean age at surgery was 5.9 weeks (+\-8weeks) in the early group and 50 weeks (+\-55.8 weeks) in the delayed group. Mean initial renal function was similar between groups [early 44.3 +\-1.4%, delayed 44.9+\-1.7%, p=0.56]. Postoperative mean renal function was also similar [early 42.2 +\-1.6%, delayed 44.9+\-1.9%, p=0.28]. On linear regression analysis, the timing of surgery did not have a significant effect on ultimate renal function.

Conclusions: In cases of unilateral severe hydronephrosis, immediate pyeloplasty does not appear to confer any significant benefit in terms of renal functional preservation over a strategy of observation and selected intervention for functional decline.

MP-05.04

A Prospective Study Using a New Bulking Agent for the Treatment of Pediatric Vesicoureteral Reflux: Bulkamid®

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Introduction and Objectives: Vesicoureteral reflux (VUR) is a prevalent disease in the pediatric population and the use of endoscopic treatment has become the first line of therapy, especially for low grade reflux. Commercially available products offer short term good success rate but their price are becoming an issue. Our objective was to evaluate the success of endoscopic treatment for VUR in children using hydrogel agent (Bulkamid®), which is actually approved for periurethral injection. It has been documented to maintain its volume a long time after the injection.

Methods: We performed a single centre, single surgeon prospective off-label study using Bulkamid®; an hydrogel agent consisting of 97,5% water and 2.5% cross-linked synthetic polymer presented in a 1.0 ml syringe, to treat VUR. All patients underwent endoscopic subureteral double HIT technique injection. Every patient had a 3-month postoperative ultrasound and voiding cystourethrogram (VCUG) to confirm the absence of de novo hydronephrosis and correction of VUR (grade 0).

Results: A total of 34 patients underwent Bulkamid® injection between March and November 2011. Median age at surgery was 43 months (range 10 mo to 21 yo). Eight males and 26 females were included for a total of 58 refluxing ureters. Bilateral reflux was identified in 22 patients. Nine patients had duplex systems and 2 of them had reflux in both renal moieties. Reflux grade was I in 7, II in 18, III in 17, IV in 11 and V in 5 ureters. Mean volume injected was 1.07 ml. Success rate for grade 1 to 3 was 79% and overall, it was 76%.

Conclusions: Our short-term data demonstrated an interesting success rate principally for low grade reflux with the off-label use of this newly approved product. It was easily injected and the technique did not require any modification. Another interesting aspect of this product is his lower cost compared to other available bulking agents.

MP-05.05

Does Routine Ultrasounds Change Management in the Follow-up of Patients with Vesicoureteral Reflux?

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Introduction and Objectives: Little data exists regarding whether U/S findings alter management plans beyond history and physical examination in VUR patients. We sought to evaluate the impact of follow-up U/S on the change in clinical management.

Methods: A prospective analysis of consecutive children with a diagnosis of VUR, seen in clinic with a routine follow-up U/S, within 4 months (Nov 2010-Feb 2011). Variables collected included: demographic data, VUR history, dysfunctional voiding symptoms, along with concurrent U/S findings. Change in management at the time of visit was defined as a new prescription, nurse counselling for voiding dysfunction, surgery, or further investigations (i.e. DMSA). On U/S, change was considered to be a change in grade of hydronephrosis or new renal scarring.

Results: The study included 114 consecutive patients. The mean age was 4.5 yrs old, mean age at diagnosis was 1.7 years, with the average child followed for a mean of 2.8 years. A change in management with stable U/S findings occurred in 14 patients, in which the change included ordering a DMSA in 9 (64%), nurse counselling for dysfunctional voiding in 3 (21%), and surgery in 2 patients (14%) patients. Overall a change on U/S was seen in 4 patients (3 with worsening hydro and one with suspected new scars). One of these received a change in management in the form of a repeat DMSA to look for worsening renal scarring. Further, when all the collected variables where analyzed for influencing change of management, only a history of urinary tract infection since the last follow-up visit was significant ($p<0.001$).

Conclusions: The only variable showing a significant effect on change in management was a history of UTI since last visit, reflective that clinical decisions were based on recent history rather than U/S findings. In an era of restricted resources coupled with the limitations of U/S to evaluate renal scarring, the value of follow-up U/S for children with VUR may need to be revisited.

MP-05.06

Methodological Quality Assessment of Randomized Controlled Trials in Hypospadias Literature

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Introduction and Objectives: To assess the overall quality of published randomized trials in hypospadias literature and to determine factors associated with better reporting quality.

Methods: Two independent investigators searched MEDLINE for all English-written hypospadias RCTs published between 1990-2011. Title,

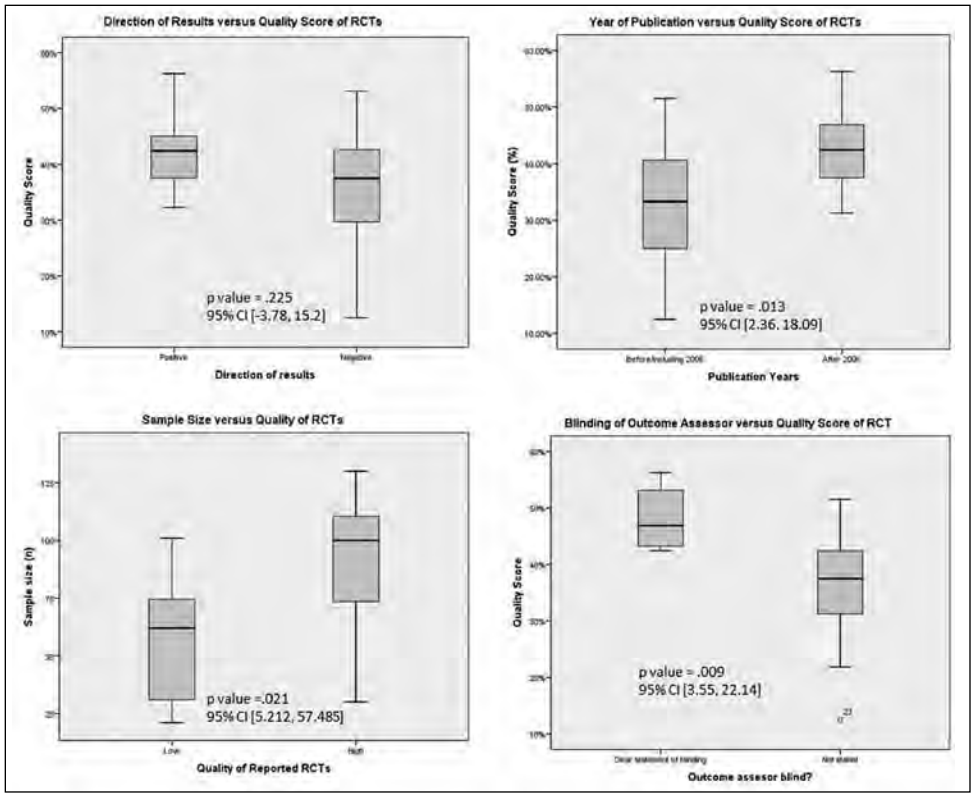

Fig. 1. MP-05.06.

authors, institutions, year and journal of publication of the included trials were concealed prior to article assessment. The quality of each study was assessed by reporting a quality percentage score based on items from the revised CONSORT statement. Studies were rated as either high (OQP >70%), moderate (OQP 40-70%) or low reporting quality (OQP ≤40%). Year of publication (before or after 2006), blinding of outcome assessor, statistical significance and sample size (n>50) were evaluated separately by using a 4-point key Methodologic Index Score (MIS; range, 0-4).
Results: We retrieved 23 relevant RCTs that included 1652 patients with an overall quality percentage (OQP) range of 13-56% (median=39%). Over 80% of studies failed to adequately report randomization strategy, allocation concealment, blinding, baseline characteristics and sample size calculations. Blinding of outcome assessor and p value significance were reported only in 5 (22%) and 7 (30%) of the trials, respectively. Median MIS was 2 (range:0-4). Univariate analyses showed that publication after 2006 (p<0.01), RCT sample size >50 (p=0.03), p value significance level (p<0.01) and blinding of outcome assessor (p<0.01) were significantly associated with better quality of RCTs. On multivariate linear regression, only blinding of outcome assessor and sample size >50 remained as an independent and significant predictors of improved MIS (Fig. 1).
Conclusions: Although the overall quality of reporting of hypospadias RCTs has improved over time, description of key methodologic issues remains poor. This may lead to biased interpretation of hypospadias trial results.

MP-05.07
Is There a Role for Prophylactic Antibiotics after Stented Hypospadias Repair?
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Introduction and Objectives: Evidence supporting post operative prophylactic oral antibiotics (POA) in routine stented hypospadias repair is lacking. In light of emerging resistance patterns, drug side effects, parental anxiety, and rising health care costs, we seek to clarify to role of POA in preventing post operative infections in this population.
Methods: After ethics board review, we studied the records of all consecutive patients undergoing stented primary or redo hypospadias repair by a single surgeon from Jan 1 - Aug 31, 2011. All patients received single dose antibiotics on induction. Prior to April 1st, all patients received POA while stented. We compared this group to the non-POA group (surgery after April 1st). Primary outcomes included urinary tract infection (UTI) defined by positive urine culture, and skin infection. These events were captured using a province-wide database from our institution's Infection Control Board for surgical site infections. Secondary outcomes included rates of fistula, dehiscence and meatal stenosis.
Results: During this period, 60 patients underwent hypospadias repair, 53 of which were stented. Mean age at surgery was 20.7 months, and mean follow-up was 8.2 months. 48 (90%) had a tubularized incised plate repair, and the remaining cases were done by glanular approximation (1) or staged approach (4). 17 (32%) received POA, and 36 (68%) had no POA. 1 patient in the POA group had post operative UTI. No UTIs occurred in the non-POA group (p=0.3). 1 patient from each group was treated for skin infection by their pediatrician (p=0.53). 2 patients in the POA group had fistula (10%), and 4 (6%) non-POA patients had fistula or stenosis (2 pts each), (p=0.9).
Conclusions: In our cohort, there was no clear difference in UTI, skin infection, or complication rates between the two groups. These results suggest that POA may be unnecessary in routine stented hypospadias repair. Further prospective study is needed to clarify these risks and benefits.

MP-05.08
The Effect of Androgen Stimulation on Postoperative Complication Rates after Penoscrotal Hypospadias Repair: a Systematic Review and Meta-analysis
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Introduction and Objectives: We conducted a systematic review and meta-analysis to summarize the effect of preoperative androgen therapy (AT) on postoperative complication rates after proximal hypospadias repair.
Methods: Electronic databases and grey literature were comprehensively searched between 1990 and 2010. Eligibility criteria were applied. Title, abstract, and full text screening was carried out by 2 independant authors and discrepancies were resolved by consensus. Heterogeneity between studies was tested using Cochran's Chi2 test and quantified by calculating I2. Quality appraisal of included studies classified studies as high, moderate or low scientific quality. Meta-analysis was performed when appropriate. A fixed effects model was used in the absence of heterogeneity and a random effects model was used when heterogeneity was present using Review Manager 5.1.
Results: Our search yielded 640 citations, of which 5 met inclusion criteria and were included in the final analysis. The 5 studies assessed postoperative complications based on preoperative AT: one was a randomized control trial (RCT) of patients with distal/midshaft hypospadias and 4 were observational studies of proximal hypospadias. In a pooled analysis of patients (n=301) with proximal hypospadias, the use of preoperative AT was associated with increased risk of postoperative complications [OR=1.63, 95%CI 0.94-2.83] with I^2 of 0%. The RCT (n=75) showed a decreased risk of postoperative complications in patients with distal/midshaft hypospadias treated with AT [OR=0.28 (0.07, 1.15)].
Conclusions: It appears that stimulation with androgens prior to hypospadias repair leads to increased complication rates in patients with proximal defects. These findings should be interpreted with caution due to limitation inherent to meta-analysis of small observational studies. A well-designed, prospective study is needed to verify these findings and to further examine the relationship between AT and hypospadias repair outcomes.

MP-05.09
Clitoroplasty and Vaginoplasty in Adolescents and Adults with Disorders of Sex Development (DSD): Lessons Learned
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Introduction and Objectives: Optimal timing for feminizing genitoplasty(FG) in patients with DSD is controversial. Early FG has recently been challenged for ethical issues. In addition, outcome data on post-pubertal surgery for DSD is scarce. Herein we report the experience with 19 patients who underwent FG in adolescence or early adulthood.
Methods: Retrospective, multicentric review of teenage and adult DSD patients who underwent surgical repair in the last 12 years. Age, diagnosis, surgical details and complications were obtained. Some patients self-reported on sexual activity, opinion on timing of surgery and postoperative clitoral sensitivity.
Results: Diagnosis was congenital adrenal hyperplasia in 15 patients (13XX and 2XY), partial androgen insensitivity in 3 and XX-DSD of unknown etiology in 1 patient (total=19). Mean age was 22 years (14 -37) and follow-up 8 years(1-12). Nine patients had undergone clitoroplasty (CL) alone in early childhood. Surgical procedures included isolated CL in 3, CL+vaginoplasty in 8 (1 redo CL), vaginoplasty alone in 8 and concurrent bilateral orchiectomies in 5 pts. Post-pubertal CL and vaginoplasty

were technically more demanding than when done in childhood. 10/19 patients (4 early, 6 late CL) with available information reported good clitoral sensitivity and ability to reach orgasm. Five patients strongly regretted not having earlier intervention in childhood and 5 developed significant loss of libido after orchiectomies. There were no major surgical complications. Most patients who underwent vaginoplasty had postoperative dilations and none developed severe stenosis. Ten patients are known to be sexually active and satisfied.
Conclusions: Post-pubertal FG is feasible although technically more difficult. Based on our data, both early and late CL can maintain clitoral sensitivity and ability to achieve orgasm. Although some patients in this series regret not having earlier repair, the question about ideal timing for FG remains unanswered.

MP-05.10
Correlation of Ultrasound (US) with Laparoscopy (LAP) in Kuwaiti Patients (pts) with Unilateral Non-palpable Testicles (NPT): Impact of Weight (WT) and Contralateral Testicular Size
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Introduction and Objectives: LAP is the gold standard in managing NPT. The value of preoperative US is debatable with possible value in obese pts and in measuring contralateral descended testicular size, where hypertrophy may be predictive of absent testicle. Herein, we examine the current predictive accuracy of US compared to LAP considering body wt and contralateral testicular size.
Methods: This is a single centre prospective study of a cohort of Kuwaiti pts managed for unilateral NPT over 1 year. All underwent preop US for ipsilateral localization and contralateral size. Pts with testicles rendered palpable under anesthesia were excluded. Wt was recorded and a subanalysis for obese pts (wt >95th percentile on wt-for-age curve) was done. Contralateral size was compared to size of an age matched control group and correlated to LAP outcome.
Results: Analysis was completed on 67 pts. On US, 26 testicles were localized and 41 were not visualized. On LAP, 30 testicles were localized and 37 confirmed absent; hence, 4/30 testicles were missed by US. Three of 4 missed testicles by US were in obese pts ($p< 0.05$). Nine obese pts were identified in the cohort; hence US had a sensitivity of 66% for obese pts. Contralateral hypertrophy significantly correlated with absent testicle on LAP with a (mean± SD) testicular length of 11.8 ± 1.7 mm vs. 17.0 ± 1.9 mm and a (mean ± SD) testicular volume of 0.33± 0.12 mL vs. 0.76± 0.27 mL, in the localized testis vs. the absent testis groups, respectively ($p<0.05$). Of note, control group measurements were 12.6 ± 2.0 mm for length and 0.30 ± 0.13 mL for volume. Overall, no testis was found by LAP for a contralateral cut-off length of 16 mm.
Conclusions: Though US cannot replace the diagnostic certainty of LAP, it localizes NPT in the majority of pts. Its accuracy declines in obese pts, limiting its value. Contralateral size may be a useful predictor of LAP outcome. Whenever available preoperatively, the results of an US may aid in counselling pts with NPT.

MP-05.11
Attempt at Fertility Preservation in Two Children with Paratesticular Rhadomyosarcoma
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Introduction and Objectives: Rhadomyoscarcoma is one of the most common forms of childhood tumor. They occur less than 4% of the time in the paratesticular region. Ultrasound is the modality of choice in differentiating between intratesticular and extratesticular lesions. Complexity arises when the ultrasound misdiagnoses the tumor as epididymitis or orchitis. Tumors may expand and require radiation which can impact fertility. We report two cases of children who required scrotal radiation due to positive margins and underwent testicular fixation in the inguinal region prior to radiation.
Methods: Information was collected on two patients with similar presentations of paratesticular rhabdomyosarcoma who underwent testicular fixation prior to radiation.
Results: Patient A presented with an embryonal paratesticular rhabdomyosarcoma. The child required radiation therapy for positive margins and underwent surgery prior to radiation to move the right testicle into the groin to avoid the radiation field. Following chemotherapy and radiation the testicle appeared viable and was returned to the scrotum. Patient B presented with a paratesticular rhabdomyosarcoma with intraabdominal lymphadenopathy. Chemotherapy was initiated for Stage IV disease. Sperm banking was discussed and he was referred for radiation. This patient was unable to provide a semen sample and prior to the initiation of radiation, his testicle was moved in the same fashion in an attempt to preserve fertility.
Conclusions: Clinical outcomes for pediatric patients with testicular tumors can be very good with early detection and multimodal therapy. While chemotherapy may damage germ cells, radiation will exacerbate it. As survival improves it becomes important to consider fertility preservation. We report two cases of surgery to fix the remaining testicle in the inguinal region to avoid the radiation field. This is a feasible choice however the long term fertility results are yet to be determined.

MP-05.12
Urodynamic Improvements after Medical Treatment of Partial Bladder Outlet Obstruction in an Animal Model
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Introduction and Objectives: Anticholinergic medication remains the standard for symptomatic treatment for partial bladder outlet obstruction (pBOO), however it is unclear if it prevents deterioration to end-stage bladder. In-vitro work has demonstrated the involvement of novel signaling pathways in bladder fibrosis, including the mTOR / MAPK pathway, which is suppressed by rapamycin. We aimed to assess the long-term urodynamic effects of oxybutinin and compare it to rapamycin in an animal model.
Methods: Following approval from the University of Alberta Animal Care & Use Committee, female Sprague-Dawley rats underwent surgical induction of pBOO. Three experimental groups were used: control, daily oral oxybutynin (3mg/kg) and daily oral rapamycin (2mg/kg). Rats were maintained and monitored up to 12 weeks, where urodynamics were performed and organs harvested.
Results: Oxybutynin treatment resulted in a 10-fold increase in bladder capacity versus controls (3.36 ± 0.53 cc vs. 0.36 ± 0.08 cc, $p<0.01$). Similar changes were seen in maximum detrusor pressure with oxybutynin treated rats compared to controls (46.5 ± 7.8 cm H_2O vs. 17.3 cm H_2O ± 4.04, $p<0.01$). No significant differences in bladder capacity or pressure were seen with rapamycin. Bladder weights were significantly different between control and oxybutinin treated rats (326 ± 30.5 mg vs. 875 ± 318 mg, $p=0.04$), as well as with rapamycin treated rats (227 ± 70 mg, $p=0.08$). Bladder wall thickness was also significantly different between control and oxybutynin treated rats (0.51 ± 0.02 mm vs. 0.71 ± 0.05 mm, $p=0.01$), and rapamycin treated animals (0.39 ± 0.01 mm, $p=0.01$).
Conclusions: Daily treatment with oxybutinin results in an increase in bladder capacity but pressures and thickness remain elevated. Rapamycin treatment results in significantly lighter and thinner bladders. Further work will determine if this data is related to deterioration to fibrotic changes and progression to the end-stage bladder.

MP-05.13
Outcomes Following Fecal Continence Procedures in Patients with Neurogenic Bowel Dysfunction
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Introduction and Objectives: Fecal incontinence in children and adults with congenital anomalies can negatively impact quality of life. Although conservative management is effective for the majority of our patients,

surgical intervention may be considered. Both the Malone antegrade continence enema (MACE) and the cecostomy button have recently become very popular. This study aims to review our results and compare the outcomes between the two procedures.
Methods: A retrospective chart review of all patients who underwent either a MACE or cecostomy followed through either the pediatric or adult spina bifida clinics was performed. Regression analysis was used to determine whether there was a difference in continence and failure rates between the two groups, controlling for gender and age at procedure. Continence was defined as the ability to wear underwear with no accidents when well.
Results: Forty-four patients were identified who had either procedure for fecal continence. Twenty-one patients underwent MACE and 23 patients underwent cecostomy. The rate of fecal continence achievement was 85.7% for MACE and 95.7% for cecostomy. For cecostomy, 8.7% switched the initial procedure, compared to 14.3% with MACE. Complication rates were 52.2% for cecostomy vs. 61.9% with MACE. Common complications for MACE were pain (28.6%) and difficulty (23.8%) with catheterizing; for cecostomy, it was difficulty flushing (21.7%).
Conclusions: There is no significant difference ($p>0.05$) between MACE and cecostomy button with respect to achieving fecal continence. Both groups do well and few patients stop using their chosen method to attain continence. Both methods present unique challenges, including difficulty catheterizing with the MACE and difficulty in flushing via the cecostomy tube. At this point there is no clear preferred method, suggesting that patients and their families need to understand the differences and make a personal choice.

MP-05.14

Onabotulinumtoxin A Endoscopic Detrusor Injection for the Treatment of Neurogenic Bladder in Children: Effect of Dose Adjustment, Multiple Injections and Avoidance of Reconstructive Procedures

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Introduction and Objectives: Treatment for neurogenic bladder (NGB) has been expanded with the introduction of intra-detrusor onabotulinumtoxin A injections. Herein we review our experience with this procedure for cases in which maximal anti-cholinergic therapy failed or was not tolerated.
Methods: We prospectively enrolled 17 patients who underwent onabotulinumtoxin A injections over a 4-year period. Demographic information, number of injections, and dose of onabotulinumtoxin A employed were captured. Children were monitored with baseline and post-injection renal ultrasound, urodynamics, and assessed for side effects, satisfaction and symptom improvement.
Results: A total of 43 sessions were performed with injections repeated every ~6 months. Mean patient age was 10.7 years (3-17). Following the first injection, mean bladder capacity adjusted for age and compliance improved by 27% ($p=0.039$) and 45.2% ($p=0.041$). After subsequent injections, with a higher mean dose of 21.1 units these values increased to 35.7% ($p=0.043$) and 55.1% ($p=0.091$) respectively. Clinical improvement of ≥50% was seen in 10 children (76.9%). However, 3 patients in whom the dose of onabotulinumtoxin A was reduced to 200 units all complained of recurrent symptoms. Fourteen children (82.3%) avoided surgical reconstruction as a second line of treatment. No complications or upper tract deterioration were found associated to this procedure.
Conclusions: Intra-detrusor onabotulinumtoxin A injection is a promising intervention for management of NGB in selected children who would have otherwise been candidates for surgical reconstruction. Our data demonstrates improvement in symptoms and urodynamic parameters. Although an optimal dose has not been determined for pediatric patients, we found better response with treatment close to 10 units/kg.

Moderated Posters 6: ED, Peyronie's Disease, Infertility
June 26, 2012, 1450-1600

MP-06.01
Antinuclear Antibody Titres Are Not Significantly Altered in Peyronie's Disease

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Introduction and Objectives: Peyronie's disease is a fibrotic, multifocal structural degeneration of the penile tunica albuginea, and is one of the most common causes of pathological penile bending acquired chordee. Fibrosis is a prominent feature in PyD and is characterized by a process of replacement of normal tissue by mesenchymal cells and the extracellular matrix produced by these cells. The excessive deposition of collagen gives rise to a plaque, which is initially fibrotic, and then, over time, can become calcific. The aim of this study was to evaluate any relationship between the antinuclear antibody and PyD.

Methods: We recruited 100 consecutive patients diagnosed with PyD by clinical and ultrasound examinations (group A). Another 30 healthy individuals who had no curvature of the penis, congenital or acquired, and who offered no history of trauma, served as the control group (group B). Basic laboratory investigations were obtained. Antinuclear antibody titres (ANA) together with serum total testosterone (TT), free testosterone (FT), and sex hormone binding globulin (SHBG) were all obtained.

Results: Demographic parameters were comparable in both groups. Serum TT and FT were significantly lower in group A than group B. No similar findings were obtained regarding SHBG. The normal titer of ANA is 1:40 or less. Higher titers are indicative of an autoimmune disease. ANA antibody may positive in 5% of individuals. Only 8 (8%) and 3 (10%) patients had positive ANA positive titres in groups A and B, respectively. All 11 patients expressed a speckled pattern in their positive ANA titres.

Conclusions: We have not found any significant association of the ANA titres in patients with PyD. Low testosterone blood levels may be associated with PyD.

MP-06.02
A Novel Rat Model for Peyronie's Disease That Demonstrates Durability and Functional Detriments

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Introduction and Objectives: Peyronie's Disease (PD) is a benign disease of localized fibrous plaque formation affecting approximately 5% of the male population with a significant impact on sexual health. The development of suitable animal models for PD has met with difficulty including spontaneous resolution of the plaque, no demonstrable deficit in penile pressures and no gross deviation. A durable and practical animal model for further study does not exist and we present our novel animal model.

Methods: Our model used intratunical tetradecyl sulphate (TS), a sclerosing agent, with transforming growth factor beta-1 (TGFb1), compared to the accepted model of TGFb1 intratunical injections. 14 male Sprague-dawley rats were injected with TS, TGFb1 or both (9, 3 and 2 respectively) and repeated 1 week later. Rats were then sacrificed at 1, 3 and 6 weeks in the TS group, 6 weeks in the TGFb1, and 9 weeks in the combined group. Functional and histological analysis was performed in all groups.

Results: Histological plaques were identified in all groups. The combined group demonstrated gross curvature and palpable scar at 9 weeks. Gross curvature and palpable plaque was noted at 3 and 6 weeks in the TS alone group. The TGF-b1 group did not demonstrate detriments in penile pressures or gross curvature. Functional detriments were seen in the TS alone and combined groups, trending towards worse maximal penile pressures detriments in the combined group.

Conclusions: Combination TS with TGFb1 appears to be a superior model for severe PD in the rat as we observed gross deviations and deleterious effects on penile pressures which have not been previously reported. Previous animal models spontaneously resolved by 9 weeks whereas our model has demonstrated durability up to 9 weeks. We present an animal model of severe PD which better emulates the human condition as compared to previous animal models.

MP-06.03
Efficacy and Histologic Changes of Repeated Saline or Intralesional Verapamil Injections and Traction Therapy in an Animal Model of Peyronie's Disease

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Introduction and Objectives: Peyronie's disease (PD) is a benign disease of localized fibrous plaque formation affecting approximately 5% of the male population with an impact on sexual health. Intralesional verapamil has demonstrated clinical benefits, but the histological effects of treatment have not been investigated. Further, traction therapy has been proposed in the literature to provide benefit to PD, and this has not been studied histologically.

Methods: 12 male Sprague-dawley rats were injected with tetradecyl sulphate and transforming growth factor beta-1 with repeat injections 1 week later to induce PD-like plaques. The group was then divided into controls (2), traction (2), intralesional saline (3), and verapamil (5) therapy. Intralesional therapy was performed 3 times per week for 2 weeks at week 4. Traction therapy was applied by placing 2 horizontal mattresses outside the plaque on the tunica at weeks 4 and 6 to apply tension on the plaque. Functional and histologic analysis was performed.

Results: Controls demonstrated gross curvature and palpable scar at 9 weeks with detriments in penile pressures. Saline showed slight improvements in penile pressures over controls, with further improvements with verapamil and traction therapy. Gross curvature improved only in the verapamil group. Subjective plaque softening was seen in all treatment arms. Trichrome stains demonstrate increased disorganized collagen most pronounced in the controls, with improvements in the saline, verapamil and traction arms.

Conclusions: All treatment arms demonstrated histologic and subjective improvements, and a trend towards functional improvements towards the verapamil and traction arms. Gross improvements of curvature were seen only in the verapamil group. This supports the pharmacologic role of calcium channel blockade above and beyond the role of mechanical plaque disruption in plaque remodeling and the role of traction as monotherapy and possibly an adjunct.

MP-06.04

Do Patients Know Their Nerve-sparing Status Following Radical Prostatectomy?

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Introduction and Objectives: Nerve-sparing (NS) techniques during radical prostatectomy (RP) have been shown to improve potency and quality of life. Patients with erectile dysfunction following surgery should therefore take into account whether NS was performed in managing their expectations and satisfaction after surgery. Our aim was to determine patients' knowledge regarding their nerve-sparing status (NSS) and what factors during their clinical treatment were predictive for this.

Methods: 111 consecutive patients attending the Erectile Dysfunction Clinic at Princess Margaret Hospital in Toronto, ON with a prior RP were surveyed from December 2010 to June 2011 prospectively. Patients were questioned whether they had undergone a NS procedure. Complete clinical data, including patient demographics, clinical notes, surgeon, consent for surgery, approach, NSS, pathological stage and grade, salvage radiotherapy, and length of follow-up were collected. Operative reports were used to determine the NSS of each patient.

Results: 45 of 111 (40.5%) patients had no knowledge of their NSS. Factors predictive for a patient having knowledge of their NSS were a younger age at surgery (p=0.0289), NS technique mentioned in preoperative clinic note (p=0.0206), NS included in consent for surgery (p=0.0002), concomitant nerve graft (p=0.0107), and having a NS (unilateral or bilateral) procedure (p=0.0005). 45 of 61 (73.8%) patients correctly identified the type of procedure they had undergone. This included only 18.7% of patients undergoing a non-nerve-sparing procedure, compared to 60.1% with unilateral and 45.2% with bilateral.

Conclusions: Following RP, a significant proportion of patients with erectile dysfunction have no knowledge of whether they underwent a NS procedure. We have identified certain variables that can be optimized in the clinical setting to better inform patients about their surgery and hopefully improve postoperative expectations and quality of life.

MP-06.05

Erectile Function Recovery Following Nerve Sural Grafting in Open Radical Prostatectomy

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Introduction and Objectives: Nerve grafting had been proposed as an alternative technique to confer a greater chance of erectile function (EF) recovery after non-nerve sparing or unilateral nerve sparing RP. We report our experience with interposition of unilateral and bilateral sural nerve graft (SNG), analyzing the success rate and identified the potential independent predictor factors of EF.

Methods: We retrospectively reviewed the records of 66 pts with cT2b -cT3a disease underwent RP with neurovascular bundle wide excision and unilateral or bilateral SNG from 2002 to 2010. Pre-and postoperative IIEF questionnaires were assessed. EF recovery was defined as postoperative IIEF-EF domain score ≥22 Cumulative EF recovery rates were assessed using Kaplan Meier curves. Potential predictors were explored using a Cox regression models.

Results: Clinical characteristics of population are lised in Table 1. Of the 66 patients, 43 (65%) received unilateral SNG and 23(35%) bilateral. The preoperative IIEF-EF was 23.37±1.64 score. Median follow-up was 52 months (22-83). The cumulative EF recovery was 58% 35% 27% at 12, 24, 36 months and no significant differences were reported among groups (p=0.271). The postoperative IIEF-EF score was 12.92±4.94 vs. 14.82±5.27 (p=0.216) in unilatral and bilateral SNG achieved a score domain ≥22 in 12 (27%) patients and 4 (18%) patients respectively, 58% and 65% patients decided to use of PDE-5I and had significantly higher EF recovery vs. patients not received therapy (43% vs. 17% p=0.009) Age at surgery (p=0.006), Hypertension (p=0.027), PDE5-I use (p=0.009) and pre-IIEF-EF (p=0.005) were significant predictors of EF recovery after surgery. Positive surgical margins were reported in 15%.

Table 1. MP-06.05

Characteristics	USNG (n=43)	BSNG (n=23)
Age yr		
≤60	19(44)	15(65)
>60	24(56)	8(5)
Pre PSA ng/ml	7.42±3.94	7.03±3.65
C. Stage		
T2b	38(88)	21(91)
T3a	5(12)	2(9)
Pre-Gleason score		
≤6	14(32)	6(26)
7	20(46)	13(56)
≥8	9(22)	4(18)
Preoperative IIE-EF		
1-10 (Severe)	-	-
11-17 (Moderate)	-	-
18-21 (Mild-Moderate)	8(19)	-
22-25 (Mild)	35(81)	23(100)
≥26 (No ED)	-	

Note: n=number; % percentage; Mean± standard deviation; USNG: unilateral sural nerve graft; BSNG: bilateral sural nerve graft; PSA: prostate-specific antigen; EF: erectile function.

Conclusions: Recognizing the limitations of a non-randomized, retrospective cohort our results concur with the recommendation of careful patient selection according to preoperative characteristics to improve success rates for EF recovery following SNG.

MP-06.06

Resident Training Laboratory, Held in Conjunction with Conference, Meaningfully Impacts Resident Technical Skills and Perceptions for Penile Implant Surgery

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Introduction and Objectives: The three-piece penile prosthesis is considered the gold standard for first or second-line treatment resistant erectile dysfunction or at the patient's preference as treatment for erectile dysfunction. Access to this treatment may be limited by the lack of availability of a prosthetic-urology trained surgeon. The Sexual Medicine Society of North America (SMSNA) provides a hands-on training course as part of the annual SMSNA Fall meeting for residents.

Methods: Twenty-nine residents completing the 2010 course, representing a broad United States geographic distribution, completed the course and a post-course multipart questionnaire. The penile prosthesis component consisted of 24 questions (the majority Likert-scaled 1-10), addressing previous training, course experience and future practice or further needs.

Results: The majority of residents were in the 4th year of residency. Cumulative exposure to 3-piece IPP was 236, 334, and 53 cases as primary surgeon, first assist, and observer respectively. Individually, 8 residents had no primary surgeon exposure, and 15/29 had 5 or less cases as first assist. 7 and 5 residents had experience with 2P and malleable devices. Self-assessed improvements in skills and procedural 'comfort' increased for 23/29 (with 5/6 high volume residents without increase reporting that exposure to new technical aspects will likely be incorporated into their surgical practice). Decision-making and trouble shooting was positively impacted in over 90% of trainees. Post-residency likelihood of penile prosthetic surgery, further prosthetic training, and need for SUPS-like mentorship was also measured.

Conclusions: Data supports that single-day, hands-on training meaningfully impacts resident perception and comfort with IPP procedures, as

well as encouraging further training opportunities. Given the costs and personnel resources involved in these sessions, the measurable impact on trainees supports continued courses.

MP-06.07

Robotic-assisted versus Pure Microsurgical Vasectomy Reversal: Prospective Control Trial

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Introduction and Objectives: Microsurgical vasovasostomy is a technically demanding procedure. Our goal was to compare robotic assisted vasovasostomy (RAVV) and vasoepididymostomy (RAVE) to standard microsurgical vasovasostomy (MVV) and vasoepididymostomy (MVE).

Methods: A prospective control trial of 152 vasectomy reversal cases performed from Aug 2007 to Jan 2012 by a single fellowship trained microsurgeon. The primary end point was operative duration. The secondary endpoint was total motile sperm count at 2, 5, 9 and 12 months postoperatively. Case breakdown was as such: 64 cases bilateral RAVV, 43 cases RAVE on at least one side, 28 cases bilateral MVV, and 17 cases MVE on at least one side. Selection of approach (robotic vs. pure microscopic) was based on patient choice. Preoperative patient characteristics were similar in both groups. The same suture materials and suturing techniques (2 layer 10-0 and 9-0 nylon anastomosis for vasovasostomy; 10-0 nylon double armed longitudinal intussusception technique for vasoepididymostomy) were used in both approaches.

Results: Median clinical follow-up was 17 months (range 1 – 50 months). 96% patency was achieved in the RAVV cases and 80% in MVV (>1 million sperm/high power field). Median operative duration was significantly decreased in RAVV at 90 min (40-180) compared to MVV at 120 min (60-180), p=0.0002. RAVE at 120 min (60-180) was significantly faster than MVE at 161 min (120-240), p=0.0005. Mean postoperative total motile sperm counts were not significantly higher in RAVV/RAVE versus MVV/MVE, but the rate of postoperative sperm count recovery was significantly greater in RAVV/RAVE.

Conclusions: The use of robotic assistance in microsurgery may have potential benefit over MVV and MVE with regards to decreasing operative duration and improving the rate of recovery of postoperative total motile sperm counts. Further evaluation and longer follow-up is needed to assess its clinical potential and the true cost-benefit ratio.

MP-06.08

Cost-effectiveness of Varicocelectomy and Percutaneous Embolization in the Management of Varicocele-associated Infertility

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Introduction and Objectives: Varicoceles are a common cause of male infertility. Several approaches to varicocele correction have been described. The purpose of our study was to compare the cost-effectiveness of non-microsurgical varicocelectomy (NMV), microsurgical varicocelectomy (MV) and percutaneous embolization (PE) in the management of varicocele-associated infertility.

Methods: A Markov decision analysis model was developed to estimate the costs and pregnancy rates associated with each treatment strategy. Recurrences following NMV and MV were re-treated with PE while recurrences following PE could be re-treated with either repeat PE, NMV or MV, resulting in five treatment strategies (Fig. 1). Pregnancy rates and recurrence rates for each procedure were estimated from the literature. Base costs of each procedure were obtained from institutional data and the Ontario Case Costing Initiative. Surgeon and anesthesia fees were derived from the Ontario Health Insurance Plan schedule of benefits. Univariate and probabilistic sensitivity analyses were performed to determine the effects of different parameters on the outcome of our model.

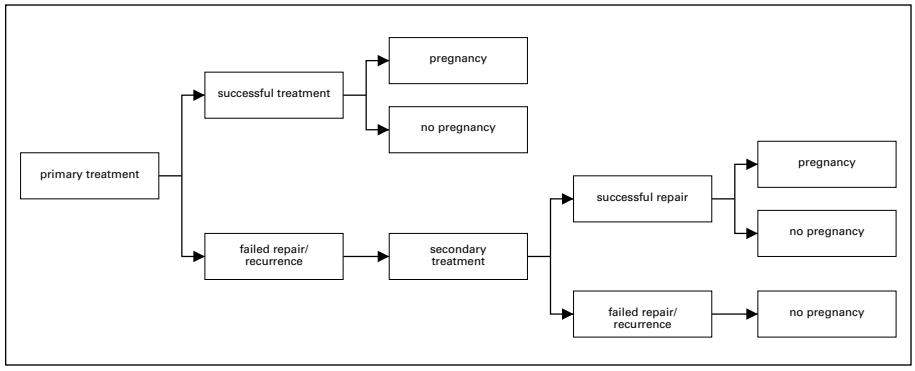

Fig. 1. MP-06.08.

Results: Primary treatment with MV was the most cost-effective strategy at $5402 Canadian dollars (CAD) per single pregnancy. Though primary treatment with NMV was the least costly approach, it yielded the fewest pregnancies. Primary treatment with PE was the least cost-effective strategy, at approximately $7300 CAD per single pregnancy. Probabilistic sensitivity analysis reinforced MV as the most cost-effective strategy at a willingness-to-pay threshold above $4100 CAD per pregnancy.

Conclusions: Microsurgical varicocelectomy is the preferred primary treatment strategy of varicocele-associated infertility, yielding the most pregnancies at an acceptable incremental cost. Primary treatment with percutaneous embolization is the least cost-effective approach and its use should be reserved for surgical failures.

MP-06.09

Use of Clomiphene Citrate for Male Idiopathic Infertility: Interim Analysis of a Prospective Study

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Introduction and Objectives: Clomiphene citrate (CC) is an estrogen receptor blocker used in the infertile male population. The theorized mechanism of action of CC is to augment follicle stimulating hormone (FSH) and luteinizing hormone (LH) which act in the testicle to increase sperm and testosterone production, respectively. The objective of this study is to determine the effect of CC administration on serum gonadotropins, testosterone and estradiol as well as semen parameters.

Methods: This interim analysis of a prospective study included males with idiopathic infertility. Twenty men were started on oral CC supplementation at a dose of 25 mg daily. Baseline serum FSH, LH, testosterone, estradiol, prolactin and semen analysis were analyzed. Repeat serum and semen analysis were collected at approximately 4 and 12 weeks after starting CC administration, respectively.

Results: All 20 men had repeat hormone levels performed, while 16 had repeat semen analysis available. The mean (SD) FSH increased from 4.8 (2.7) to 11.2 (7.9) IU/L (p=0.0003) with mean LH rising from 6.1 (5.3) to 10.1 (7.6) IU/L (p=0.0003). Mean (SD) testosterone levels increased from 10.8 (3.9) to 20.0 (9.7) nmol/L (p=0.00005) while estradiol increased from 106.7 (45.0) to 204.6 (112.2) pmol/L (p=0.002). Mean (SD) total sperm counts increased from 30.6 (33.1) to 58.4 (48.2) x 10^6 sperm (p=0.03). Semen volume, morphology, motility and serum prolactin were not significantly affected. Sperm counts were improved in 14 patients (88%) after CC treatment, and no patients became azoospermic. No apparent deleterious effects of CC were noted during follow-up.

Conclusions: Clomiphene citrate appears to represent a safe and effective method to raise serum testosterone, gonadotropins and sperm counts in males with idiopathic infertility, although estradiol levels were also increased. Longer-term supplementation with CC would therefore require close patient monitoring.

Moderated Posters 7: Bladder
June 26, 2012, 1450-1600

MP-07.01
Safety of Intravesical Mycobacterial Cell Wall-DNA Complex Given Immediately Postsurgery in Patients with Non-muscle-invasive Bladder Cancer

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Introduction and Objectives: Intravesical chemotherapy is recognized as effective immediately after transurethral resection of bladder tumor/biopsy, whereas bacillus Calmette-Guérin (BCG) is contraindicated for ≤2 weeks postsurgery. Mycobacterial cell wall-DNA complex (MCC), exhibits a dual mechanism of action (chemotherapeutic and immunostimulatory effects) and shown to reduce non-muscle-invasive bladder cancer (NMIBC) recurrences after BCG failure. Clinical trial data in patients with BCG-refractory NMIBC were analyzed to determine whether MCC could be safely instilled immediately postsurgery.

Methods: Retrospective analysis identified patients who received an MCC dose immediately postsurgery. Patients received 6 weekly MCC instillations, followed by 3 instillations at 3, 6, 12, 18, and 24 months. At their discretion, some investigators instilled MCC ≤1 day postsurgery.

Results: 18 of 129 patients (14%) received a total of 32 instillations of MCC within one day of surgery. Adverse events (AEs) were experienced by 28% (5/18) of patients following 16% (5/32) of instillations (all in different patients and when MCC given on the day of surgery). In 4 of these 5 instillations, AEs consisted of hematuria, urinary frequency, dysuria, and suprapubic cramps. All were mild to moderate in severity and not treatment related. 1 patient experienced rigor, nausea, and headache with moderate severity after 1 instillation (possibly related to MCC). No AEs resulted in treatment discontinuation. 3 of the 5 patients received an instillation on the same day of surgery at another time without experiencing AEs. 39% (7/18) of the patients were disease free at 1 year.

Conclusions: MCC was well tolerated when instilled intravesically immediately postsurgery in this group of patients. Further investigation is needed to determine if MCC can be administered in the immediate postoperative setting to prevent reimplantation of circulating tumor cells and potentially impact the rate of recurrence.

MP-07.02
The Impact of Concomitant Carcinoma in Situ on Upstaging Following Radical Cystectomy for Bladder Cancer

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Introduction and Objectives: To evaluate the impact of concomitant CIS on upstaging and outcome in bladder cancer patients treated with radical cystectomy.

Methods: We collected and pooled a database of 2287 patients who have undergone radical cystectomy between 1998 and 2008 in 8 different centres across Canada. Collected variables included patient age, gender, tumor grade, histology and presence of concomitant CIS with either cTa-1 or cT2 disease.

Results: Upstaging following radical cystectomy occurred in 47% and 58% of patients with cTa-1 and cT2 disease, respectively. On univariate analysis, patient age (p=0.016), mixed tumor histology (p=0.07) and the concomitant presence of CIS with cT2 disease (p<0.0001) were independent prognostic factors for upstaging while concomitant CIS with cTa-1 disease trended towards more upstaging (p=0.053). On multivariate analyses, the presence of concomitant CIS with both cTa-1 and cT2 tumors was independently associated with disease upstaging (p=0.0001 and 0.019, respectively). The presence of concomitant CIS on cystectomy specimens was not significantly associated with OS, RFS or DSS.

Conclusions: These results show that while the presence of concomitant CIS is not prognostic on cystectomy after accounting for pathologic stage, its concomitant presence on TUR specimens is significantly predictive of a higher rate of upstaging following radical cystectomy.

MP-07.03
Young Age Predicts Favorable Disease Characteristics and Outcomes among Patients with Urothelial Carcinoma of the Bladder

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Introduction and Objectives: The clinical characteristics and outcomes of patients under the age of 40 with urothelial carcinoma of the bladder are not well understood. The purpose of our study was to better describe the initial disease characteristics and outcomes of young patients with urothelial carcinoma of the bladder.

Methods: This was a retrospective cohort study using the Surveillance Epidemiology and End Results (SEER) database. All patients diagnosed with urothelial carcinoma of the bladder from 1988 - 2008 were identified. Patients with non-urothelial histologies were excluded. Patients were categorized into age groups of <40, 40-49, 50-59, 60-69 and ≥70 years old. Differences between categorical variables were analyzed with Chi squared analysis. Disease specific mortality was calculated using multivariate cox regression analysis.

Results: Age <40 years old was associated with an increase in proportion of patients presenting with low grade and Ta tumors (Table 1). When controlling for stage, grade, sex and race, there was a stepwise increase in cancer specific mortality with advancing age at diagnosis compared to those <40 years (HR from 1.76 [CI 1.41 - 2.18] for those aged 50-59 up to a HR of 3.71 [CI 3.02 - 4.55] for those aged ≥70 years). The cumulative risk of progression from Ta low grade tumors to muscle invasion were <1.5% for all age groups, but there was a stepwise decrease in the cumulative risk with each younger age group (p<0.001). Younger age is associated with increased use of cystectomy (p<0.001) and decreased use of radiation therapy (p<0.001) in the group with muscle invasive disease.

Conclusions: Young patients with urothelial carcinoma of the bladder tend to present with more favorable pathological characteristics than older patients. They experience lower rates of progression to muscle invasive disease and have superior cancer specific survival rates when controlling for both stage and grade at presentation compared to older patients.

Table 1. MP-07.03. Patient characteristics

	Age				
	<40	40–49	50–59	60–69	≥70
Stage/Grade					
TaLG	1,536 (72.8%)	3,923 (56.4%)	10,210 (50.4%)	17,695 (45.6%)	37,061 (39.8%)
TaHG	137 (6.5%)	586 (8.4%)	1,853 (9.2%)	3,992 (10.3%)	10,800 (11.6%)
CIS	12 (0.6%)	60 (0.9%)	238 (1.2%)	523 (1.4%)	1,417 (1.5%)
T1LG	157 (7.4%)	562 (8.1%)	1,623 (8.0%)	3,376 (8.7%)	7,480 (8.0%)
T1HG	118 (5.6%)	696 (10.0%)	2,511 (12.4%)	5,411 (14.0%)	14,724 (15.8%)
T2	80 (3.8%)	663 (9.5%)	2,199 (10.9%)	4,550 (11.7%)	14,209 (15.3%)
T3/4	69 (3.3%)	464 (6.7%)	1,621 (8.0%)	3,222 (8.3%)	7,456 (8.0%)
Total	2,109	6,954	20,255	38,769	93,147

MP-07.04

Evaluation of the Survival Benefit of Multidisciplinary Care in High Risk Bladder Cancer

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Introduction and Objectives: The impact of multidisciplinary care (MDC) on outcomes in bladder cancer remains unexplored. We examined the survival benefit of MDC in a high risk bladder cancer cohort using population based data.

Methods: Using Surveillance, Epidemiology, End Results data linked to Medicare records, we identified patients with high risk, bladder cancer, who were diagnosed from 2004-2005 with follow-up through 2007. High risk patients included those treated with definitive surgery within 6 months of diagnosis or those managed non-surgically with at least muscle invasive disease. Patients were stratified into MDC groups based on specialty provider visit history: urology alone (U), urology and medical oncology (UM), and urology, medical oncology and radiation oncology (UMR). We further stratified the UM group based on a stricter definition of MDC: whether both consultations were within 1 month of each other (UM-1) or not (UM-2). Multivariable Cox proportional hazard regression models adjusting for demographic, socioeconomic and pathologic factors

Table 1. MP-07.04

	Multidisciplinary Care Group			
	U	UM-1	UM-2	UMR
Surgical Group (n=1001)	175 (17.5)	264 (26.4)	487 (48.7)	75 (7.5)
Stage				
Ta, Tis, T1	45 (25.7)	57 (21.6)	90 (18.5)	10 (13.3)
T2	87 (49.7)	88 (33.3)	182 (37.4)	27 (36.0)
T3	33 (18.9)	79 (29.9)	136 (27.9)	19 (25.3)
T4	10 (5.7)	36 (13.6)	75 (15.4)	18 (24.0)
Missing	0 (0)	4 (1.5)	4 (0.8)	1 (1.3)
Lymph Nodes				
Lymph Nodes Negative	83 (47.4)	123 (46.6)	214 (43.9)	25 (33.3)
Lymph Nodes Not Examined	76 (43.4)	93 (35.2)	179 (36.8)	37 (49.3)
Lymph Nodes Positive	13 (7.4)	42 (15.9)	84 (17.2)	13(17.3)
Total Missing	19			
Neoadjuvant Chemotherapy	2 (1.1)	18 (6.8)	26 (5.3)	13 (17.3)
Neoadjuvant Radiation	0 (0)	1 (0.4)	2 (0.4)	14 (18.7)
	U	**UM-1**	**UM-2**	**UMR**
Non-surgical Group (n=1583)	233 (14.7)	387 (24.4)	515 (32.5)	448 (28.3)
Stage				
T2	185 (79.4)	283 (73.1)	396 (76.9)	344 (76.8)
T3	12 (5.2)	23 (8.7)	34 (6.6)	26 (5.8)
T4	36 (20.6)	81 (20.9)	85 (16.5)	78 (17.4)
Initial Treatment				
Initial Chemotherapy	17 (7.3)	101 (26.1)	132 (25.6)	35 (7.8)
Initial Radiation	4 (1.7)	15 (3.9)	23 (4.5)	148 (33.0)
Initial Chemotherapy and Radiation	0 (0)	10 (2.6)	30 (5.8)	211 (4.7)
No Initial Therapy	212 (91.0)	261 (67.4)	330 (64.1)	54 (12.1)

U: urology; UM: urology and medical oncology; UMR: urology, medical oncology and radiation oncology.

Table 2. MP-07.04

	Cancer Specific Survival			Overall Survival		
Surgical Group	**HR**	**95%CI**	***p* value**	**HR**	**95%CI**	***p* value**
UM-1 (versus U)	1.77	0.95–3.27	0.07	1.51	0.91–2.50	0.11
UM-2 (versus U)	1.52	0.85–2.73	0.16	**1.61**	**1.01–2.57**	**<0.05**
UMR (versus U)	1.8	0.84–3.84	0.13	1.70	0.93–3.12	0.08
	Cancer Specific Survival			**Overall Survival**		
Non-Surgical Group	**HR**	**95%CI**	***p* value**	**HR**	**95%CI**	***p* value**
UM-1 (versus U)	**1.93**	**1.45–2.56**	**<0.0001**	**1.78**	**1.44–2.19**	**<0.0001**
UM-2 (versus U)	1.23	0.93–1.62	0.15	**1.33**	**1.09–1.62**	**0.006**
UMR (versus U)	**1.67**	**1.17–2.37**	**0.005**	**1.76**	**1.36–2.28**	**<0.0001**

U: urology; UM: urology and medical oncology; UMR: urology, medical oncology and radiation oncology; HR: hazard ratio; CI: confidence interval.

and stratified by surgical versus non-surgical management were used to estimate the hazard ratio for bladder cancer specific survival (CSS) and overall survival (OS) by MDC group.

Results: There were 1001 surgically and 1583 non-surgically managed patients. Tumor stage and treatment for each of the MDC groups are illustrated in Table 1. Patients with MDC received more chemotherapy than non-MDC patients, with no difference between the strict and loose MDC groups. Use of MDC was associated with decreased OS and CSS in non-surgical patients (Table 2).

Conclusions: Worse outcomes with MDC among patients treated non-surgically likely reflect a selection bias whereby lower risk patients are treated exclusively by urologists. MDC did not appear to consistently improve outcomes in surgically managed high-risk bladder cancer patients, possibly related to the low use of neoadjuvant chemotherapy in this cohort.

MP-07.05

Increased Expenditures on Follow-up Care after Definitive Surgery for Bladder Cancer

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Introduction and Objectives: We describe temporal changes in expenditures on outpatient postoperative care, and evaluate which aspects of care contribute most to increased expenditures. Temporal changes in survival were correlated to changes in expenditures.

Methods: Using Surveillance, Epidemiology, End Results data linked to Medicare records, we identified 2408 patients aged ≥66 years with bladder carcinoma treated with definitive surgery between 1992 and 2005. Geography and time (2011) standardized outpatient Medicare expenditures on urine, laboratory, imaging investigations, and physician visits were evaluated for two years after surgery. Expenditure trends were assessed with linear regression. Multivariable Cox proportional hazard regression models were used to estimate mortality hazard ratios by surgical year.

Results: The average per patient expenditures during 2 years of follow-up after surgery increased from $1352 in 1992/3 to $2865 for patients in 2004/5 ($p<0.0001$). Expenditures on physician visits ($84 to $232), urine ($19 to $49) and imaging investigations ($1213 to $2538) increased significantly ($p\leq0.0001$ for all), with no significant change in laboratory expenditures. Advanced imaging investigations appeared to drive the increased expenditures on follow-up care, with increased utilization also seen in these investigations ($p<0.05$ for all). After adjusting for demographic, socioeconomic, comorbid conditions, treatment and pathologic factors, improved mortality outcomes were seen from 2000-2005 (Table 1).

Conclusions: The increased utilization and associated costs of MRI and CT are largely driving the increased expense of follow-up care after surgery for bladder cancer. Increases in survival were seen in more recent years; whether this is the result of improved patient selection, treatment, or follow-up remains to be elucidated.

MP-07.06

Utilization of Perioperative Chemotherapy for Bladder Cancer: a Population-based Study

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Introduction and Objectives: Evidence from clinical trials and international guidelines support the use of perioperative chemotherapy for patients with muscle-invasive bladder cancer undergoing cystectomy, particularly in the neoadjuvant (NACT) setting. Here we describe delivery of perioperative NACT as well as adjuvant chemotherapy (ACT) in the general population of Ontario, Canada.

Methods: Electronic records of treatment were linked to the population-based Ontario Cancer Registry to identify all patients who underwent cystectomy for bladder cancer in Ontario 1992-2006. Utilization was compared across 3 study periods: 1992-96, 1997-01, 2002-06. Logistic regression was used to analyze temporal trends in the use of perioperative chemotherapy, while controlling for changes in case mix.

Table 1. MP-07.05. Multivariate Cox proportional hazards regression analysis for bladder cancer specific and overall survival.

	Bladder Cancer Specific Mortality		
Surgery Cohort	**HR**	**95%CI**	***p* value**
1992/3	Referent	–	–
1994/5	0.96	0.75-1.22	0.74
1996/7	0.98	0.77-1.26	0.90
1998/9	0.90	0.70-1.16	0.42
2000/1	**0.65**	**0.50-0.85**	**0.001**
2002/3	**0.74**	**0.58-0.95**	**0.02**
2004/5	**0.67**	**0.50-0.89**	**0.01**
Surgery Cohort	**Overall Mortality**		
	HR	**95%CI**	***p* value**
1992/3	Referent	–	–
1994/5	0.86	0.72-1.03	0.11
1996/7	0.94	0.78-1.14	0.52
1998/9	0.90	0.74-1.09	0.26
2000/1	**0.71**	**0.58-0.86**	**0.0005**
2002/3	**0.72**	**0.59-0.88**	**0.001**
2004/5	**0.74**	**0.59-0.91**	**0.006**

HR: hazard ratio; CI: confidence interval.

Results: In 1992-2006, 4886 patients underwent cystectomy and the absolute number of surgical procedures done yearly nearly doubled over the study period. The overall survival of patients treated with radical surgery did not vary over the three study periods with a 3- and 5- year survival of 47.9% (45.6-50.1) and 39.5% (37.1-41.9) respectively during the most recent era. Of those undergoing cystectomy in Ontario, 736 (16%) received perioperative chemotherapy; NACT and ACT were used in 142 (3%) and 623 (14%) of cases respectively. While the use of NACT did not change over the 3 study periods, utilization of ACT increased a small degree with time (10%, 15%, 16%; $p<0.001$). Use of perioperative chemotherapy varied widely across catchment areas of provincial cancer centres (11% to 22%, $p<0.001$).
Conclusions: Despite accumulating evidence and guideline development over the study period, chemotherapy remains underutilized in Ontario. The observed variations in use of chemotherapy across geographic regions and SES, may represent opportunities for further outcomes research as a natural experiment and possibly to target future interventions to optimize utilization.

MP-07.07
Utilization and Predictors of Neoadjuvant Chemotherapy for Muscle-invasive Bladder Cancer in the Veteran's Health Administration

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Introduction and Objectives: The adoption of neoadjuvant chemotherapy in bladder cancer as a clinical paradigm has been slow despite level 1 evidence supporting a survival benefit with its use. We report trends in utilization of neoadjuvant chemotherapy and evaluate predictors of its use in a comprehensive, contemporary cohort in the Veterans Health Administration (VA).
Methods: Using the VA Clinical Cancer Registry, we identified all patients with clinically localized muscle invasive bladder cancer from 1997 to 2007. Receipt of neoadjuvant chemotherapy had been evaluated prospectively by cancer registrars. Patients who did not undergo definitive local therapy and were treated initially with chemotherapy alone were assumed to have been treated with neoadjuvant chemotherapy without subsequent local therapy. The trend in neoadjuvant chemotherapy use was evaluated with a Chi-square test. Predictors of neoadjuvant chemotherapy were evaluated using a multivariable logistic regression model incorporating demographic, comorbid and pathologic factors.

Table 1. MP-07.07. Multivariable predictors of neoadjuvant chemotherapy utilization in the Veteran's Health Administration

	OR	95%CI	*p* value
Age (per year older)	1.02	1.00–1.03	0.04
Tumor Stage (reference Ta, Tis, T1)			
T2	3.32	2.14–5.14	<0.0001
T3, T4	2.17	1.35–3.51	0.002
Metastatic disease	2.55	0.92–7.07	0.07
Year of Diagnosis (reference 2003 and bfore)			
2004	1.67	1.10–2.52	0.02
2005	1.52	1.00–2.31	0.048
2006	2.06	1.41–3.01	0.0002
2007	2.83	1.97–4.06	<0.0001

OR: odds ratio; CI: confidence interval.

Results: There were 2297 and 2125 patients identified in the surgical and non-surgical groups, respectively. 4.8% and 8.3% of patients received neoadjuvant chemotherapy in the surgical and non-surgical group, respectively. Temporal trends in chemotherapy use showed an increase in neoadjuvant chemotherapy use over time ($p<0.0001$); however the usage of neoadjuvant chemotherapy remained <11%. On multivariable analysis, older patients with advanced, localized disease, who were treated in more recent years, were more likely to receive neoadjuvant chemotherapy (Table 1). Charlson comorbidity was not predictive of neoadjuvant chemotherapy use.
Conclusions: While overall use of neoadjuvant chemotherapy in the VA population for bladder cancer remains low, analysis of temporal trends show increasing utilization. At the patient level, receipt of neoadjuvant chemotherapy was largely dictated by locally advanced disease.

MP-07.08
Laparoscopic Radical Cystectomy - Is There Evidence of Learning Curve? Experience of 60 Consecutive Cases Performed in a High Volume Tertiary Cancer Centre

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Introduction and Objectives: Radical cystectomy is recognized as a highly morbid procedure. Laparoscopic radical cystectomy (LRC) is potentially less invasive in comparison with open cystectomy; however it is a technically challenging procedure with a significant learning curve. We describe our initial experience with LRC.
Methods: From May 2005 to November 2010 we performed sixty LRC for muscle invasive or non muscle invasive high grade bladder cancers. We compared our first 30 consecutive patients (group A) with the next 30 consecutive patients (group B). We prospectively collected patient demographic data, operative time, blood loss and length of stay along with complications recorded using the Clavien- Dindo classification.
Results: All procedures were completed laparascopically. One patient had a neobladder in group A while the other patients had an ileal conduit. The mean BMI was 27 and median ASA grade of 2 in both groups. On average 11 lymph nodes were removed. One patient in each group has positive surgical margin however both patients had T3 and T4 disease on histology. We noted improvement in all domains in consecutive group including complications recorded, as per Clavien-Dindo classification (Table 1).
Conclusions: Our results suggest that LRC is a safe procedure with outcome data comparable to open surgery. When we compared these 2 groups of patients it would appear that various outcome measures such as. Operative time, blood loss, length of stay and complications as per Clavien –Dindo classification do improve with increasing surgeon experience. The factors behind this improvement are uncertain but along with increased surgical experience factors such as improved patient selection may also be important. We would expect that our outcomes may well

Table 1. MP-07.08

	Group A	Group B
Grade 0	07	11
I	1	5
II	14	10
III	7	3
IV	1	1
V	0	0
Operative Time	465 min	398 min
Blood Loss	1100 ml	580 ml
Length of stay	22 days	16 days
Blood Transfusion	31 units	16 units

improve with increasing numbers and we continue our prospective audit of outcomes using the Clavien-Dindo classification.

MP-07.09

Hypoxia Is Independently Associated with Poor Outcome in Urothelial Bladder Cancer Patients Treated with Radical Cystectomy

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Introduction and Objectives: Intra-tumoral hypoxia has been reported to be an independent prognostic marker for disease-free and overall survival in many tumor types following radiotherapy or surgery. We therefore tested whether the expression of hypoxia-associated biomarkers was a prognostic factor in muscle-invasive bladder cancer (MIBC) treated by RC.

Methods: Two cohorts of MIBC patients (clinical T2/T3N0M0) treated with RC were studied following ethics approval (University of Toronto, Canada: n=99; University of Turku, Turku, Finland: n=186). An expert GU-pathologist reviewed all slides and tissue microarrays were constructed. Using semi-quantitative immunohistochemistry, the expression of the hypoxia markers HIF-1α, GLUT-1, CA-IX, as well as the Ki-67 proliferation marker, was determined by three independent reviewers. Mean expression was used for outcome analyses. The association between each markers and disease-specific survival (DSS) were determined using univariate and multivariate analyses.

Results: In univariate analysis, GLUT-1 was a significant of predictor of DSS in patients operated by RC (p=0.01). Ki-67 at a 5% cut-off was also significantly associated with DSS (p=0.028).In multivariate analysis, GLUT-1 was highly significant for predicting DSS (p=0.004) as were conventional parameters like node status or pathological stage. HIF-1α and CA-IX were not prognostic.

Conclusions: GLUT-1 and Ki-67 are promising biomarkers for predicting outcome in patients with MIBC treated with RC. Our results should be confirmed in large validation cohorts. Novel treatment strategies which combat tumor hypoxia should continue to be explored.

MP-07.10

Heat Shock Protein 70 (HSP70) as a Recurrence Marker for PT1 Bladder Cancer

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Introduction and Objectives: Heat shock proteins (HSPs) are overexpressed in a wide range of human cancers and are implicated in tumor cell processes and recognition by the immune system. As HSPs proteins are among the most immunogenic reported molecules and BCG therapy is immune dependent, the role of HSPs in patients with BC treated with BCG warrants investigation. We evaluated HSP70 expression levels and its relationship to pathological, clinical parameters and FGRF3 mutation and protein overexpression in primary T1BC treated with BCG.

Methods: 69 patients diagnosed with confirmed primary T1BC treated at the University Health Network, Toronto were studied. Microarrays were built and HSP70 protein expression was determined by standard immunohistochemistry. Slides were co-reviewed with an experienced uropathologist with staining scores dependent on the expression and intensity of the marker. HSP expression was correlated with pathological, clinical outcomes and with the expression of FGFR3. FGFR3 mutation status was examined by multiplex PCR-SNaPshot analysis. Kaplan-Meier method and multivariate Cox-regression analysis were used for data analysis.

Results: Mean age of patients was 71.1 years (±8.5). HSP70 was found to be expressed in 29/53 (55%) high-grade and in 9/14 (64%) low-grade tumors. Kaplan-Meier survival analysis demonstrated that the lack of HSP70 expression was a significant predictor for disease recurrence (p<0.05) but did not affect progression. In a multivariate model adjusting for grade, size and concomitant CIS, lack of HSP70 expression remained a significant predictor for recurrence (HR of 1.952, 95%CI 1.02-3.75; p=0.045). HSP70 was shown to correlate with FGFR3 expression and mutation (p<0.05).

Conclusions: HSP70 is a promising marker in T1 BC treated with BCG. Both HSP70 and FGFR3 may play an important prognostic role in T1 BC identifying a group at lower risk of recurrence.

MP-07.11

How Should Locoregionally Recurrent or Advanced Primary Malignancies of the Bladder or Ureter Be Managed? Potential Role of Multimodality Therapy Incorporating Surgery and Intraoperative Radiotherapy

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Introduction and Objectives: For patients with locoregionally (LR) recurrent or advanced primary tumors of the bladder or ureter, there are limited therapeutic options. This is to report outcomes of multimodality therapy incorporating maximal surgical resection and intraoperative electron radiotherapy (IOERT) for such patients.

Methods: From 1983-2009, a total of 17 consecutive patients, consisting of 11 with LR recurrence after cystectomy for bladder carcinoma, 4 with LR recurrence after nephroureterectomy for ureteral carcinoma, and 2 with advanced primary bladder carcinoma were treated with a multimodality therapy. 8 patients had received prior treatment for LR recurrence and the multimodality treatment was a second salvage attempt. 16 patients received perioperative EBRT as part of the multimodality treatment with a median dose of 50.4 Gy. Extent of surgical resection was R0 (n=7), R1 (n=1), and R2 (n=9). After maximal resection was achieved, IOERT was delivered to residual disease or the area at the highest risk of residual disease. The median IOERT dose was 12.5 Gy. Overall survival (OS) and relapse patterns were estimated from the date of resection and IOERT, using the Kaplan-Meier method.

Results: The median follow-up for surviving patients was 3.6 years (range 1.1-10). OS at 1, 2, and 5 years was 53%, 31%, and 16%. Central (within the IOERT field), LR (tumor bed or regional lymph nodes), and distant relapse at 2 years were 15%, 49%, and 67%, respectively. On univariate analysis, resection of all gross disease (R0-1) was associated with improved OS (p=0.03). Mortality within 30 days of surgery and IOERT was 0%. Two patients (12%) experienced NCI-CTCAE grade 4-5 late toxicity.

Conclusions: In our cohort, the multimodality approach incorporating IOERT yielded a low rate of central recurrence within the IOERT field with acceptable toxicity. However, LR and distant relapse were common, indicating a need for better patient selection, LR therapy, and systemic therapy.

MP-07.12

Tumor Stage on Re-staging Transurethral Resection Predicts Recurrence and Progression Free Survival of High Risk Superficial Bladder Cancer

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Introduction and Objectives: Debate in the management of high risk superficial bladder cancer between conservative (bladder-sparing) treatment and early cystectomy continues. Efforts are ongoing to determine helpful clinical and biological prognostic factors in decision making. Our objective was to evaluate the clinical variables that affect the outcome of patients with high risk superficial transitional cell carcinoma (TCC) who underwent re-staging transurethral resection (TUR) in terms of recurrence free-survival (RFS) and progression free-survival (PFS).

Methods: The clinical data of 348 patients with superficial bladder cancer treated in the division of urology in the Centre hospitalier de l'Université

de Montréal (CHUM) from 2004 to 2010 were reviewed. Of these, 59 patients with high risk superficial TCC who underwent re-staging TUR and were not upstaged to muscle invasive disease were included in this analysis (Table 1).

Results: On re-staging TUR, 30 patients had no residual tumor (pT0) and 29 patients had residual tumors. Of the 30 patients with pT0, 13 (43.3%) had tumor recurrence (median time to recurrence: 13.3 months) and 2 (6.6%) had progressed to muscle invasive disease (median time to progression: 23 months) (Table 2). Of the 29 patients with residual tumor on re-staging TUR, 23 (79.3%) had a recurrence (median time to recurrence: 5.4 months) and 9 (31%) had progressed to muscle invasive disease (median time to progression: 11 months). On multivariate analysis, re-staging TUR pathology and the regimen of BCG (induction versus maintenance) are independent predicting factors for RFS (p=0.001 HR: 1.85), (p<0.001 HR: 0.09) respectively while for PFS re-staging TUR pathology is the only independent predicting factor (p=0.019 HR: 1.89).

Conclusions: Presence of pT0 on re-staging TUR is associated with better RFS and PFS. Patients with persistence of superficial cancer on restaging TUR require close follow-up and in some cases could be considered for early cystectomy.

Table 1. MP-07.12. Pathology on initial TUR compared to the pathology on re-TUR

Initial pathology		Pathology of re-TUR			
	No. of patients	T0, n (%)	Ta low grade, n (%)	Ta high grade, n (%)	T1 high grade, n (%)
Ta low grade	6	2 (33%)	2 (33%)	1 (17%)	1 (17%)
Ta high grade	17	11 (64%)	1 (6%)	5 (29%)	0
T1 high grade	36	17 (47%)	0	4 (11%)	15 (42%)
Total	59	30 (51%)	3 (5%)	10 (17%)	16 (27%)

TUR: transurethral resection.

Table 2. MP-07.12. Correlation of pathology on re-TUR with tumor recurrence or progression

Pathology on re-TUR	No. of patients	Tumor recurrence n (%)	Median time to recurrence (months)	Tumor progression, n (%)	Median time to progression (months)
T0	30	13 (43.3%)	13.3	2 (6.6%)	23
Residual tumor on re-TUR	29	23 (79.3%)	5.4	9 (31%)	11
Ta low grade	3	3 (100%)	9.1	0	–
Ta high grade	10	8 (80%)	4.6	2 (20%)	31
T1 high grade	16	12 (75%)	6.1	7 (43.75%)	9.6
Total	59	36 (61%)	7.8	11 (18.6%)	13

TUR: transurethral resection.

Moderated Posters 8: Miscellaneous
June 26, 2012, 1450-1600

MP-08.01
Preliminary Results of the Resident Manpower Survey by the CUA Socioeconomic Committee: Are We Training too Many Urologists?

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Introduction and Objectives: Urology residency training positions have increased in the last 10 years. Data on potential employment is limited and out of date. This study aims to assess perceptions of current Canadian Urology residents with respect to future manpower issues. Information is intended to help the Socioeconomic committee of the Canadian Urological Association (CUA) address the concerns of residents. This is the first of a two-part survey; the second will assess the division heads' future demand for urologists.

Methods: In this study, a multiple-choice questionnaire was emailed to program directors and dispersed to residents in Canadian Urologic Surgery programs in 2011. Consent was obtained from the CUA.

Results: There are 155 potential respondents with a current response rate of 19%. Currently, 72% of residents intend to stay where they are training. A majority (65%) intends to have full or part-time academic affiliation. Eighty percent intend to complete a fellowship. Fifty two percent believe there are too few jobs. Sixty nine percent believe supply is greater than demand for urology residents. A significant majority at 76% and 81% feel the CUA and residency programs should limit training spots respectively. Further, 31% feel not secure and 45% somewhat secure about the future job prospects. An overwhelming majority (97%) believes the CUA should help residents find employment, and 87% believe CUA should help with practice management and billing.

Conclusions: The preliminary results of this survey suggest that there is a resident perception of too many urologists being trained in Canada, and that the CUA should be involved in limiting residency positions. There appears to insecurity about future employment and residents believe the CUA should have a role in addressing employment issues.

MP-08.02
Incorporating Patient Simulation into In-training Exams to Assess CanMEDS Competencies in Urology Residents

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Introduction and Objectives: As the Royal College of Physicians and Surgeons of Canada increasingly emphasizes a competency-based approach to resident education, residency programs must develop methods to directly evaluate CanMEDS roles. Incorporating patient simulation into assessments allows residents to demonstrate knowledge and skills in a safe, standardized environment. We developed a novel simulation station for use in a Urology in-training Objective Structured Clinical Exam (OSCE) to assess multiple CanMEDS competencies.

Methods: The OSCE was developed to assess the collaborator, communicator, and medical expert (including technical skills) CanMEDS roles. Residents had to interview a standardized patient and interact with a nurse to perform a cystoscopy and stent removal using a flexible cystoscope and bladder model. The bladder model was constructed with a papaya and double-J stent. Collaborator/communicator roles were assessed using global ratings, medical knowledge assessed using a checklist, and technical skills evaluated using a validated rating scale. Scores were compared between residents of different training levels to determine discriminative validity. We noted equipment costs and assessed resident satisfaction with qualitative interviews.

Results: Nine urology residents participated in the exam (PGY 3-5). The scenario was easily run in the allocated 15-minute time slot. Disposable equipment cost was $228 (papayas: $4, double-J stents: $214). Overall scores were similar between all levels. Technical skills scores were higher in PGY-5 residents (mean score 79%) as compared to PGY-3/4 residents (mean score 73%). Residents felt the station allowed for reasonable demonstration of competencies.

Conclusions: We successfully developed and implemented a novel OSCE station to assess multiple CanMEDS roles, including technical skills. This approach is feasible and relatively low cost, and could be adopted by Urology residency programs as part of routine assessment.

MP-08.03
The Newly Graduated Canadian Urologist: Underemployed and Overtrained?

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Introduction and Objectives: Newly graduated surgical specialists report difficulty obtaining employment. There is a perception among urology residents that fellowship training is becoming a requirement after residency, and that there are few job opportunities available upon graduation. The purpose of this study was to examine the postgraduate training patterns and employment choices of urology residents.

Methods: Canadian urology program directors were asked to complete a short summary of Canadian residents graduating from their programs between 1998-2009. Basic information on the fellowship, graduate degree(s), type of practice and location of practice was requested. Logistic regression models were used to evaluate for significant linear trends over time.

Results: Program director response rate was 100%. 258 Canadian urology residents graduated over the study period, with a median of 22 graduating/year. 72% of graduates completed a fellowship, of which 62% included protected research time. The most common subspecialty was MIS/endourology (39% of fellowships). There was a significant increase in fellowship training over time ($p<0.0001$) mostly due to an increase in MIS/endourology fellowships. 11% of residents obtained a graduate degree during residency or fellowship; the acquisition of graduate degrees increased significantly over the study period.

Almost all graduates are currently employed; 34% are academic urologists. Among all graduates, 50% are practicing within 100km of their residency training site, 16% are practicing in the United States and 22% are practicing in a rural location. There has been no significant change in these proportions over time.

Conclusions: Fellowship training, especially in MIS/endourology, has become more common. Graduate degrees are becoming a more common addition to urologists' training. At this point there is no evidence that there has been a significant change in a urology resident's ability to obtain employment upon graduation.

MP-08.04

Trends in Matching to Urology Residency in Canada: Are We Becoming Non-competitive?

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Introduction and Objectives: Urology is perceived as a competitive specialty choice. Declining undergraduate exposure and the preference for "lifestyle specialties" may jeopardize urology's popularity. Our objective was to assess trends in application & matching rates to urology compared to other surgical specialties.

Methods: We reviewed data collected by CaRMS and the Canadian Post-MD Education Registry since expansion in Canadian med school enrollment (2002-11). The following were examined: applicant preference, number of positions, gender patterns & match results. "Surgery" included Gen Surg, Ortho, Plastics, ENT and Urology.

Results: From 2002-11 CaRMS applicants increased from 1117 to 2528 (126%). The number of applicants selecting surgery 1st increased from 178 to 338 (90%). The number of surgery positions increased from 138 to 275 (100%). Urology positions increased from 15 to 31 (113%). Applicants to urology increased only 40% (30 to 42). The proportion of all CARMs applicants selecting urology as their 1st choice decreased from 2.7% (30) to 1.7% (42). The ratio of 1st choice urology applicants to positions decreased from 2 to 1.35. The probability of matching urology as 1st choice increased from 50% to 75%. Female medical graduates increased from 51% to 58%. The female applicants selecting surgery 1st increased from 21% (49) to 41% (173). In contrast, females selecting urology 1st rose from 13% (4) to 17 %(7).

Conclusions: Urology is becoming less competitive. Residency positions have doubled since 2002 while the number of applicants remains static. This trend was not reflected in other surgical subspecialities. Factors accounting for this may include poor undergraduate exposure, demand for specialties with controllable lifestyles, gender shifts in undergraduate medicine & lack of role models. The need for undergraduate exposure to urology and vetting of residency positions remains paramount.

MP-08.05

Video Laparoscopic Trainers vs. Less Expensive Simple Laparoscopic Trainers

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Introduction and Objectives: Advancement of laparoscopic simulation has led to more sophisticated, but generally more costly, surgical trainers. We assessed how sophistication affects laparoscopic simulator efficacy to explore cost-effective alternatives to expensive models. A systematic review and meta-analysis was conducted to compare video laparoscopic trainers (VLTs) and simple laparoscopic trainers (SLTs) (mirror trainers & home-made webcam trainers) with regards to teaching laparoscopic skills.

Methods: A comprehensive search of MEDLINE and EMBASE yielded 864 citations after excluding duplicates. Narrative reviews, retrospective studies, surveys and historical articles were also excluded. Three independent reviewers performed full-text screening with disagreements settled by group consensus. Five papers satisfied inclusion criteria (study examines laparoscopic procedures/tasks and includes a direct comparison between a VLT and a SLT) and were included in the analysis. Quality assessment of included studies was completed. The following characteristics were assessed in all included studies: tasks performed, performance on the VLT and performance on the SLT. We examined only continuous data with calculation of the standard difference in means (Std diff means). Performance times were pooled using a random effects model and a chi-square test was employed to test for heterogeneity.

Results: Meta-analysis of the included papers compared post-training performance time between VLTs and SLTs for 2 laparoscopic tasks: suturing and object transfer. The table below summarizes our findings. No statistical difference in performance was found between VLTs and SLTs. As well, a meta-analysis of the 7 laparoscopic tasks assessed in the study by Keyser et al favoured the VLT over the SLT (Std diff means -1.82, 95%CI -0.61 to 0.02, p=0.07) (Table 1).

Table 1. MP-08.05

Outcomes	Number of Studies (Number of Participants)	Absolute Effect[a] (95%CI)	Quality of Evidence[b]
Suturing Time	3 (74)	-0.410 (-0.908 to 0.089)	High
Object Transfer Time	4 (122)	0.358 (-0.377 to 1.093)	High
Task Completion Time (Keyser et al.)	1 (22)	-0.298 (-0.618 to 0.022)	High

a: Standard difference in means; random effects model; b: Quality of evidence based on the GRADE system; CI: confidence interval.

Conclusions: Our review shows that VLTs and SLTs are equally proficient in teaching laparoscopic skills, suggesting SLTs are a cost-effective alternative.

MP-08.06

Do Hunner's Ulcers Represent Bladder Ischemia?

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Introduction and Objectives: Interstitial cystitis/painful bladder syndrome (IC/PBS) is a chronic inflammatory disorder of unclear etiology. Patients can be subsetted on the basis of ulcerative and non-ulcerative patients. There is a paucity of data on the location of Hunner's ulcers within the bladder. Recent data from hyperbaric oxygen therapy for IC/PBS suggest a role for ischemia in Hunner's ulcers. We studied Hunner's ulcers to determine if they represent possible bladder ischemia

Methods: Consecutive patients undergoing cystoscopy and hydrodistension for IC/PBS being evaluated. Presence and location of ulcers were noted and compared for age, sex, duration of symptoms, daytime voiding frequency, nocturia, mean voided volumes, interstitial cystitis symptom index, problem index, pain, urgency frequency (PUF) scores, anesthetic capacity. Fisher exact test and unpaired t-tests were used for statistics

Results: There were 127 consecutive subjects studied, 14 with ulcers (11%) and 112 without ulcers (89%). Ulcer subjects were older, had more severe symptoms, and had smaller voided and anesthetic capacities compared to non-ulcer subjects. Of the 14 subjects with ulcers, 7 were on the lateral wall alone, 3 were on the posterior wall alone, 3 were multifocal on the lateral wall and dome, and 1 was multifocal and on the posterior wall, dome, and trigone

Conclusions: Hunner's ulcer patients have smaller anesthetic bladder capacities than non-ulcer patients. These decreased volumes are evidence of decreased compliance compared to non-ulcer patients. Ulcers occurred in older patients compared to non-ulcer patients. These findings are consistent with decreased perfusion. We propose that Hunner ulcers represent the ischemic bladder's response to IC/PBS disease.

Table 1. MP-08.07

RCT	Intervention	n	ICSI mean change difference (CI or *p*-value)	Pain mean change difference (CI or *p*-value)
	BCG	265	-0.18 (-0.42, 0.07)	0.28 (-0.52, -0.04)
	Amitriptyline	231	-1.5 (-2.5, -0.05)	-.04 (-1.0, 0.3)
	Mycophenolate mofetil	58	1.0 (-0.7, 2.6)	1.4 (0.2, 2.5)
	Alkalized lidocaine	102	-0.42 (-0.83, 0.0)	-0.40 (-0.81, 0.0)
	Chondroitin sulfate	65	-0.29 (-0.78, 0.20)	0.37 (-0.12, 0.87)
	Chondroitin sulfate	98	-0.10 (p=0.95)	-0.43 (p=0.53)
	Physical therapy	81	-1.0 (p=0.31)	-0.7 (p=0.27)
	Ca^{2+} Channel $\alpha_2\delta$ Ligand	161	-1.58 (-3.24, 0.09)	-0.82 (-1.72, 0.08)
Open Label	**Intervention**	**n**	**ICSI Δ from baseline (*p*-value)**	**Pain Δ from baseline (*p*-value)**
	Pentosanpolysulfate	380	-3.0 to -3.8 (p<0.001)	n/a
	Chondroitin sulfate	53	-5.0 (p<0.001)	-2.6 (p<0.001)
	Lidocaine eluting device	18	-4.5 to -5.4 (p<0.001)	-3.6 to -4.9 (p<0.001)
	UPOINT directed Study	78	ongoing	

ICSI: interstitial cystitis symptom index; CI: confidence interval; BCG: Bacillus Calmette-Guérin.

MP-08.07

Trials and Tribulations of a Canadian Interstitial Cystitis Research Clinic

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Introduction and Objectives: The clinical trial experience of the Queen's University Interstitial Cystitis Research Clinic in Kingston provides valuable lessons in management of patients with IC/Bladder Pain Syndrome.

Methods: Clinical treatment trials in IC/BPS undertaken over the past 8 years by our IC Research Clinic were critically reviewed for possible lessons learned.

Results: The Queen's University IC Research Centre designed, implemented and analyzed 12 national and international single and multicentre clinical trials involving 2,144 patients as either the PI or co-PI research site. Results of the various trials evaluating novel or innovative therapies are listed in Table 1.

Conclusions: Eight years of personal clinical trial experience has led us to conclude that there will never be a single successful therapy for all patients with IC/BPS. We believe that phenotypically directed multi-modal therapy will be the key to treatment success in this enigmatic condition.

MP-08.08

Cannabis (Marijuana) Use in Men with Chronic Prostatitis/Chronic Pelvic Pain Syndrome

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Introduction and Objectives: To examine the prevalence, indication, dose and frequency of cannabis use among men with CP/CPPS.

Methods: Parallel online and clinic questionnaire surveys were conducted to assess cannabis use among men with CP/CPPS. As a check on study generalizability, comparisons between the online data (n=365) and clinic data (n=60) showed no clinically meaningful differences in the outcome variables of quality of life (QoL), suicidal ideation, pain and urinary symptoms were evident between these groups.

Results: 49% reported cannabis use (n=206). 29% (n=59) of these men indicated use for pain relief and 71% (n=147) for recreation. The pain users (age 38 +/- 14), were younger than recreational users (42 +/- 12) and individuals who reported never using cannabis (45 +/- 13)(p=0.001). More pain users reported cannabis was of pain reduction benefit in comparison to recreational users (X^2=3.83, p=0.05). No differences were found between recreational and pain users in degree of side effects (X^2=4.43, p=0.22), reasons for stopping (X^2=4.84, p=0.18), or use frequency (X^2=5.48, p=0.07). There were no differences in dose smoked between the pain and recreational users (X^2=5.80, p=0.12), but a difference was found in dose eaten between these two groups (20% of pain users consume more than 1 gm per dose vs. only 7% of recreational users (X^2=12.51, p=0.002). Pain users reported more pain (F=4.04, p=0.05), poorer CP/CPPS QoL/impact (F=8.61, p=0.004), and more suicidal thoughts (F=6.59, p=0.01) than recreational users.

Conclusions: Cannabis use is prevalent (49%) in men with CP/CPPS, but not necessarily used for CP/CPPS symptoms. It is important that urologists understand the relevance of this data and question their patients on their use (and effect/impact on symptoms) of marijuana/cannabis. To our knowledge, this is the first study to attempt to document the prevalence and patterns of cannabis use in a CP/CPPS population.

MP-08.09

The Clinical Spectrum of Anterior Urethral Stricture: Detailed Analysis of a Large Single Institution Cohort

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Introduction and Objectives: It is generally assumed that patients with urethral stricture present primarily with lower urinary tract symptoms (LUTS). There is a paucity of data examining this clinical assumption. There is also no uniformly accepted clinical definition of urethral stricture or measure of treatment success. The objective of this study is to accurately delineate the clinical spectrum of anterior urethral stricture.

Methods: A retrospective analysis was performed on a cohort of 611 patients presenting with anterior urethral stricture over a 6-year period from July 2004 to June 2010. The primary (presenting) complaint and associated symptoms were classified according to one of ten clinical categories.

Results: The most common presenting complaint were LUTS as typically found in the AUA-SI (54.3%). Another 23.4% of patients presenting primarily with acute urinary retention. Symptoms other than LUTS or urinary retention accounted for 22.3% of presenting complaints. Additionally, 22.9% of patients experienced genitourinary pain, 50.7% of patients required emergent urologic treatment and 7.4% of patients presented with renal insufficiency or urethral abscess/necrotizing fasciitis directly related to urethral stricture.

Conclusions: Although many patients with urethral stricture present initially with LUTS or urinary retention, almost one-quarter of patients

present with a different primary concern. A patient-centred definition of urethral stricture should encompass more than the absence of LUTS or urinary retention. Urethral stricture is also not solely a "quality of life" condition as many patients present emergently or have a potentially life threatening condition directly related to the stricture.

MP-08.10

Impact of Radiotherapy on Surgical Repair and Outcomes in Patients with Rectourethral Fistula

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Introduction and Objectives: The majority of patients who present with rectourethral fistula acquired it as a complication of radiotherapy for prostate cancer or by iatrogenic injury of the rectum during prostatectomy. The study goal was to determine whether choice of operation and results following surgery for rectourethral fistula are influenced by prior radiotherapy.

Methods: Male patients who underwent surgery for rectourethral fistula from 1998-2010 were identified from a prospectively maintained database. Data regarding etiology, surgical treatment and outcomes were analyzed.

Results: Fifty patients were identified. Median age was 65 yrs and median follow-up of 17 months. The etiology of rectourethral fistula was XRT induced following therapy for prostate or rectal cancer in 29 patients. A total of 57 repairs were performed. XRT patients were approached transabdominally more often than non-radiated patients (91 vs. 9%). Primary fistula repair was more frequently attempted (76 vs. 24%) and more frequently successful in the non-XRT patients (81 vs. 10%). Patients with prior pelvic XRT were significantly more likely to receive permanent colostomy (71% vs. 4%) and cystectomy with conduit urinary diversion as part of management (76% vs. 24%). Of the 7 radiated patients who did not undergo cystectomy initially, 4 developed recurrent fistulas and received cystectomy and diversion. Of the 3 remaining patients with bladder preservation and XRT-induced rectourethral fistula, 2 patients demonstrated mixed urinary incontinence and total fill non-compliant bladders. The remaining patient developed total urinary incontinence.

Conclusions: Almost no patients with XRT-induced rectourethral fistula will avoid permanent supravesical urinary diversion or colostomy. Bladder preservation led to recurrent fistula and poorly functioning bladders in all cases. In contrast, most patients with fistula not caused by XRT can have a successful transperineal repair avoiding a permanent stoma.

MP-08.11

Comprehension and Preferences for Graphical Representations of Quality of Life after Prostate Cancer Treatment

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Introduction and Objectives: Integration of quality of life (QoL) measurement into clinical prostate cancer (PCa) practice may enhance communication, improve satisfaction with care, and affect the timing of delivery of secondary therapies for the side effects of PCa treatment. We developed graphical representations of prostate cancer QoL (dashboards) and compared patients' comprehension and preferences among four alternative formats to those of prostate cancer providers.

Methods: We conducted interviews with PCa patients and providers, assessing health literacy, subjective numeracy, and graphic literacy with validated instruments. We then presented both groups with the candidate dashboards and assessed participants' comprehension, confidence in interpretation, helpfulness rating, and rank order preferences.

Results: Our study has included 29 PCa patients and 24 providers. Patients had a mean age of 71 years and most had at least a college degree (76%). The health literacy (mean score 6.9±0.26 out of 7), numeracy (mean score 4.3±0.94 out of 6), and graphic literacy (mean score 11.4±1.4 out of 13) of our patient sample was high. Comprehension did not vary by dashboard format. The pictographs exhibited lower helpfulness ratings (p=0.001). Preference elicitation strongly favored the bar graph format in patients (rank 1/4 in 52% of interviews, p<0.001) but there was equal preference for the table, bar and line formats among providers (each ranked 1/4 in 33% of interviews). The pictograph tested poorly in both groups (rank 4/4 in 69% and 75% of patients and providers respectively).

Conclusions: Among a high literacy and numeracy sample of PCa patients, comprehension and preference ranking strongly favored bar graph formats for QoL dashboards, although providers had no definite preference. Inclusion of lower literacy patients may yield different results. Future work will determine if clinical integration of these dashboards is associated with improved health outcomes.

MP-08.12

Population-based Assessment of Enterocystoplasty Complications among Adult Patients

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Introduction and Objectives: Enterocystoplasty is procedure that can be used to treat several types of bladder dysfunction. Our objective was to conduct a retrospective, population-based cohort study to identify the rate of urologic surgical procedures after enterocystoplasty among adult patients, and determine whether there are significant predictors associated with them.

Methods: A retrospective, population-based cohort was assembled using administrative data records; adult patients who underwent an enterocystoplasty between 1993-2009 were included. Administrative data sources were used to measure our primary exposures (neurogenic bladder, and concurrent catheterizable channel or anti-incontinence procedure) and primary outcome (urologic surgical procedures after enterocystoplasty). Multivariable Cox proportional hazards models were used (covariates: age, gender, Charlson score, and socioeconomic status).

Results: We identified 243 patients: 61% had neurogenic bladders, 20% had a simultaneous incontinence procedure, and 18% had creation of a catheterizable channel. Median follow-up was 7.8 (IQR 4.0-12.2) years. The proportion of patients who required a subsequent urologic procedure was 40% (0.098 procedures per person year of follow-up). A simultaneous incontinence procedure at the time of enterocystoplasty was a significant predictor (HR 1.47, 95% CI 1.02-2.12, p=0.0414) of future surgical procedures. Cystolitholapaxy was the most common subsequent procedure (25% of patients); a catheterizable channel conferred a significant risk of cystolitholapaxy (HR 2.92, 95% CI 1.461-5.85, p=0.0024).

Conclusions: Repeat urologic surgery is common after enterocystoplasty. Patients who require a simultaneous incontinence procedure at the time of enterocystoplasty are more likely to require future surgery. Patients with catheterizable channels have a significant risk for subsequent cystolitholapaxy.

Moderated Posters 9: Basic Science
June 26, 2012, 1450-1600

MP-09.01
Knockdown of Integrin-linked Kinase Reduces Invasive and Metastatic Potential of Renal Cell Carcinoma by Impeding Epithelial to Mesenchymal Transition

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Introduction and Objectives: Integrin-linked kinase (ILK) is a serine/threonine kinase implicated in the regulation of cell growth and survival, cell cycle progression, epithelial-mesenchymal transition (EMT), invasion and migration, angiogenesis. However, the role of ILK has not been evaluated in renal cell carcinoma (RCC). We investigated the role of ILK on cancer progression and metastasis and therapeutic potential of ILK inhibition in RCC.

Methods: Non-cancerous renal tubular cells (HK-2) and RCC cells (UMRC-6, UMRC-3 and Caki-1) were used to examine baseline expression of ILK and EMT markers in RCC. RNAi using siRNA was used to knock down ILK in vitro. After transient transfection, crystal violet assay and cell cycle analysis using FACS were performed to check the effect of ILK on tumor growth. We examined changes of stress fibers and focal adhesion with phalloidin-rhodamine and vinculin antibody. Scratch assay and invasion assay were performed to evaluate EMT phenotypic behavior after ILK inhibition.

Results: ILK is less expressed in normal cells (HK-2) and low stage RCC cells (UMRC-6) but highly expressed in advanced and metastatic RCC cells (UMRC-3 and Caki-1). Advanced RCC cells also showed high expression or increased activity of molecular EMT markers including Snail, Zeb1 and decreased activity of E-cadherin and increased degradation of β-catenin. ILK knockdown inhibited tumor proliferation but the inhibition was moderate and cell cycle progression was not significantly affected. Knockdown of ILK reduced stress fiber formation and focal adhesions and also effectively impeded phenotypic EMT markers such as cell migration and invasion in Caki-1 and UMRC-3 cells.

Conclusions: ILK is highly expressed in advanced RCC and its high expression is related to EMT markers in RCC. Knockdown of ILK inhibited molecular and phenotypic EMT markers. These results suggest the therapeutic potential of ILK inhibition on invasion and metastasis of advanced RCC.

MP-09.02
Enhanced Tumor Oxygenation Following Short-term Sunitinib Therapy in a Renal Cell Carcinoma Model: An Unexpected Finding

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Introduction and Objectives: It has been shown in vivo that tyrosine kinase inhibitors such as sunitinib exert antiangiogenic effects directly on endothelial cells, but also by blocking compensatory changes in the activity of hypoxia-inducible factors (HIF), mainly HIF-1α. The present study utilized positron-emission tomography (PET) to elucidate the effect of short-term sunitinib therapy on tumor hypoxia.

Methods: Caki-1 tumors were grown for 4 weeks in Balb c/nu-nu mice both subcutaneously and within renal capsule. Both models were analyzed first with dynamic [18F]FAZA PET up to 3h post-injection (p.i.). In a second setup, mice bearing 2 subcutaneous Caki-1 tumors were sorted into 2 groups: a) receiving 40mg/kg/d sunitinib i.p. for 5 days prior to analysis with [18F]FAZA PET, b) vehicle control injections. Tumor uptake of [18F]FAZA and immunohistochemical tissue staining with pimonidazole and CD-31 were determined.

Results: Functional analysis of subcutaneous Caki-1 tumors with PET revealed a mean standardized uptake value (SUV) after 3h p.i. of 0.32±0.02 (n=6/3) for [18F]FAZA. Based on the clearance patterns, orthotopically grown tumors were not detectable with PET alone. The SUV3h for [18F]FAZA was significantly lower in sunitinib group compared to controls in the subcutaneous model: 0.23±0.02 vs. 0.42±0.05 (n=4/2). The time-activity curve indicated significant [18F]FAZA washout from treated tumors as compared to the control. This was confirmed by the biodistribution of [18F]FAZA, resulting in SUV3h of 0.29±0.03 in treated vs. 0.45±0.06 (n=8/4) in control mice. CD31 binding (%) was reduced in sunitinib treated groups: 1.8±0.1% vs. 0.6±0.1% (n=80/4).

Conclusions: A reduction of bound [18F]FAZA in this RCC tumor model following short-term TKI-therapy suggests improved tumor oxygenation. This was observed despite sunitinib causing a significant reduction in vascular density. The mechanism of this paradoxical observation warrants further investigation.

MP-09.03
Evasive Resistance to VEGF-targeted Anti-angiogenic Therapy Is Acquired by Activation Angiogenesis Pathways Independent of VEGF in Renal Cell Carcinoma

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Introduction and Objectives: Anti-angiogenic therapy provides significant growth inhibition in clear cell type renal cell carcinoma (CCRCC). However, evasive resistance develops in most responding cases due to unclear mechanisms. We investigated the mechanism of resistance to VEGF-targeted therapy in CCRCC both in vitro and in vivo.

Methods: Two different conditioned cell lines were developed from wild type Caki-1. Sunitinib-conditioned Caki-1 was developed by chronic exposures to sunitinib and hypoxia-conditioned Caki-1 was developed by chronic exposures to 1% hypoxia. We characterized these conditioned cells in vitro and response patterns to sunitinib were evaluated using subcutaneous xenograft models with parental and conditioned cells. In vivo angiogenesis assays were performed to characterize angiogenesis potentials. Finally, mRNA microarray was performed to find pathways that induce resistance to anti-angiogenic therapy.

Results: Sunitinib inhibited proliferation of HUVEC cells, but did not inhibit tumor proliferation in CCRCC cells at pharmacologically relevant doses. In vitro sunitinib-conditioned Caki-1 cells did not show obvious resistance to sunitinib compared to parental cells, but when tested in vivo these cells appeared to be highly resistant to sunitinib therapy. In contrast, hypoxia-conditioned Caki-1, although more resistant to hypoxia and showing increased vascularity by upregulating VEGF production, did not develop sunitinib resistance either in vitro or in vivo. Matrigel plug assay confirmed that tumor angiogenesis was relatively intact and less affected by sunitinib in xenografts of sunitinib-conditioned cells.

Conclusions: Resistance to VEGF-targeted therapy is acquired by activation of VEGF-independent angiogenesis pathways induced by interactions with VEGF-targeted drug but not by hypoxia. Our results suggest that more broad inhibitions of tumor angiogenesis are required to prevent development of resistance to anti-angiogenic therapy in CCRCC.

MP-09.04

Quantitative Proteomic Analysis of Exosome-enriched Extracellular Microvesicles Obtained Following an *in vitro* Model of Urinary Tract Obstruction

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Introduction and Objectives: An *in vitro* model of urinary traction obstruction (UTO) using renal proximal tubule cells (NRK-52E) subjected to mechanical stretch has helped to elucidate the molecular pathology of UTO. Because renal proximal tubule cells have been suggested to release protein-containing extracellular microvesicles (exosomes) into the urinary space, the goal of this study was to confirm production of exosomes by NRK-52E cells and characterize changes in protein abundance that result from UTO simulation using quantitative proteomics.

Methods: NRK-52E cells were subjected to 24 hours of stretch-relaxation, with a maximum of 20% maximal biaxial stretch on a FX-4000 Flexercell Strain Unit. The efficacy of UTO simulation was measured by cell death ELISA, and extracellular microvesicles were isolated by ultracentrifugation of the cell culture media. Relative protein abundance was measured by spectral counting following mass spectrometry using a ThermoFisher LTQ linear ion trap mass spectrometer with 5 replicate analyses.

Results: Microvesicle production was confirmed by electron microscopy and immunoblotting for known the exosomal proteins Annexin 1 and CD81. Stretched cells showed an average of a 3 fold increase in cell death. Histone proteins had the most significant changes in abundance, but other proteins, gelsolin, nebulin, haptoglobin, an integral membrane serine 2 protease, Fibronectin 1 and polyubiquitin were also noted to be increased in abundance in stretch cell extracellular microvesicles. Significance testing was conducted using a student's t-test.

Conclusions: We show that renal proximal tubule cells generate extracellular microvesicles whose protein profile is altered following an *in vitro* model of UTO. Quantitative proteomic analysis demonstrates proteins important in apoptosis, the cytoskeleton, and cellular response to oxidative stress are altered in abundance after mechanical stretch, providing insight into the pathophysiology of UTO.

MP-09.05

Rat Bone Marrow Derived Mesenchymal Stem Cell Therapy in a Parkinsonian Animal Model of Detrusor Overactivity

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Introduction and Objectives: We have previously shown that cellular therapy can induce a transient urodynamic improvement in a rat model of Parkinson's disease where bladder dysfunction is induced by a unilateral injection of 6-hydroxydopamine (6-OHDA) into the medial forebrain bundle (MFB). Our goal was to test the hypothesis that transplantation of rat bone marrow mesenchymal stem cells (rBMSC) in substantia nigra (SN) can produce longer lasting improvements of cystometric bladder dysfunction if the cells are protected by microencapsulation (ErBMSC).

Methods: Female Sprague-Dawley rats underwent a unilateral stereotactic injection of 6-OHDA in the MFB. Two weeks following the lesion, a treatment injection was performed in the ipsilateral SN of vehicle, 100,000 GFP positive rBMSC, or 100,000 ErBMSC. Animals were evaluated by cystometry at four different time points after treatment: 7, 14, 28, and 42 days. Urodynamic parameters were compared using a two-way ANOVA.

Results: Overall, transplantation of ErBMSC resulted in lower bladder capacity than vehicle treatment and rBMSC (0.65 vs. 0.95 and 0.87 mL respectively, $p<0.01$), but also a lower residual volume than rBMSC (0.078 vs. 0.160 mL, $p<0.05$). The ErBMSC animals had a lower threshold pressure (TP) at 28 days and a lower level of spontaneous activity (SA) at 42 days compared to vehicle-treated animals (TP: 20.85 vs. 43.84 cm H2O; SA: 7.71 vs. 22.43 cm H2O, $p<0.05$). At 42 days, the rBMSC group had a lower TP (16.65 vs. 37.10 cm H2O, $p<0.05$), intermicturition pressure (11.70 vs. 39.57 cm H2O, $p<0.01$), SA (3.57 vs. 22.42 cm H2O, $p<0.01$) and area under the curve (12.46 vs. 39.91, $p<0.01$) than vehicle-treated animals.

Conclusions: We confirmed persistent urodynamic effects of the 6-OHDA lesion up to 42 days after vehicle injection. Lasting urodynamic improvements at 42 days after treatment was observed more markedly in animals treated with rBMSC alone. Microencapsulation of the rBMSC did not improve these effects.

MP-09.06

Intrathecal Cannabinoid Agonist Effects in Cystometric Evaluation of Normal Rats

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Introduction and Objectives: Systemic administration of cannabinoid receptor agonists affects bladder function possibly by binding to peripherally located cannabinoid receptors. Intrathecal cannabinoids have been shown to produce antinociception in several neuropathic pain animal models. Our goal was to determine the effects of cannabinoid receptor agonists administered intrathecally on the cystometric bladder function of normal rats.

Methods: Female Sprague-Dawley rats underwent a bladder catheter and a polypropylene intrathecal catheter insertion prior to cystometric evaluation. Urodynamic parameters were recorded in awake animals at baseline, and after sequentially administering vehicle and incremental dosages of drug. The drugs delivered in two different groups were methanandamide (5, 10, 20, 40 µg), a selective CB1 agonist, and WIN 55212-2 (10, 20, 40 µg), a non-selective cannabinoid agonist. Urodynamic parameters were compared using one-way ANOVA.

Results: The micturition pressures did not change after vehicle or drug administration in either group. In the methanandamide group (n=7), bladder capacity significantly increased from baseline after 40 µg administration (0.62 vs. 0.91 mL, $p<0.05$), and frequency decreased (16.1 v.s 11 voids/hour, $p<0.05$). Bladder capacity also significantly increased after 40 µg administration when compared to baseline (0.80 vs. 1.04 mL, $p<0.01$) and to vehicle (0.82 vs. 1.04 mL, $p<0.05$) in the WIN 55212-2 group (n=8). Frequency decreased after 40 µg was administered when compared to baseline (12.5 vs. 9.6 voids/hour, $p<0.01$) and to vehicle (12.2 vs. 9.6 voids/hour, $p<0.05$). Micturition volume increased from baseline after 20 µg administration (0.76 vs. 1.05 mL, $p<0.05$).

Conclusions: We demonstrated that intrathecal cannabinoid agonist administration increases bladder capacity and decreases micturition frequency in normal rats. These effects may be mediated by central cannabinoid receptors activated by these drugs.

MP-09.07

Rational Targeting of Fibroblast Growth Factor Receptor (FGFR)-3 in Bladder Cancer

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Introduction and Objectives: Mutations in the FGFR3 gene are found in up to 80% of low grade papillary bladder cancers, and can lead to constitutive, ligand independent activation of signaling. Overexpression of FGFR3 is found in approximately 50% of high grade and invasive tumors. In this study we evaluated mutation and expression of FGFR-3 in a North American cohort and studied the effect of targeted FGFR3 inhibition in pre-clinical models of bladder cancer.

Methods: DNA was extracted from 170 bladder cancer specimens and PCR analysis with direct sequencing was performed to detect mutations in exons 7 and 10. FGFR3 expression was analyzed by immunohistochemistry on a tissue microarray derived from 143 patients with bladder can-

cer. FGFR3 expression, phosphorylation and downstream signaling were measured in a panel of bladder cancer cell lines, and efficacy of a small molecule inhibitor (TKI258) was tested on signaling and 3H-thymidine incorporation. Systemic treatment with an inhibitory anti-FGFR3 monoclonal antibody was evaluated in orthotopic xenografts. Tumor burden was measured with bioluminescent imaging.
Results: FGFR3 mutations were identified in 26% of bladder tumors and 56% of low grade papillary lesions. Overexpression of FGFR3 was noted in 53% of all bladder tumors. FGFR3 inhibition effectively abrogated constitutive phosphorylation of FGFR3 and p42/44MAPK in a subset of bladder cancer cell lines, resulting in growth inhibition. The growth of UM-UC14, RT112 and UM-UC1 orthotopic xenografts in nu/nu mice was inhibited by 40%, 66% and 85%.
Conclusions: These studies underline the clinical relevance of FGFR3 mutation and expression in bladder cancer. Furthermore, the results offer proof of principle for rational targeting of FGFR3 in patients with bladder cancer.

MP-09.08

Circulating Interlukin-6 and Nerve Growth Factor Are Associated with Periprostatic Fat Length and Cancer Detection among Non-obese Men Presenting for Prostate Biopsies

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Introduction and Objectives: We previously demonstrated an association between circulating adipokine levels and prostate cancer. Visceral fat (i.e. periprostatic fat) has greater metabolic activity than peripheral fat, however the association of serum adipokine levels with periprostatic fat has not been characterized. We aimed to correlate adipokine levels with BMI (a measure of peripheral fat) and periprostatic fat (visceral fat) in a population of men who present for prostate biopsy.
Methods: Cohort consisted of 200 subjects initially stratified by BMI (100: BMI >27 vs. 100: BMI ≤27). Of the obese subjects 50 prostate cancers were age matched 1:1 with 50 controls. The same process was used for the non-obese subjects. Clinical data (age, PSA, DRE, BMI) and serum collected prior to biopsy were used to measure adipokines (adiponectin, leptin, PAI, Resistin, HGF, IL-1β, IL-6, IL-8, MCP-1, NGF and TNF-α)using Milliplex Multi-Analyte Profiling kits. Periprostatic fat (shortest distance between the pubic bone and the prostate) was measured on a sagital trans rectal ultrasound image. Sample analysis, clinical data recording and fat measurements were done blinded to pathology results. We used Pearson correlation to associate serum adipokine levels with periprostatic fat and BMI.
Results: Periprostatic fat was correlated with NGF (r=0.65, p=0.002) and IL-6 (r=0.54, p=0.004) among non-obese subjects with prostate cancer. Conversely periprostatic fat was not correlated with serum adipokine levels among the obese subjects. BMI did not correlate with serum adipokine levels among subjects diagnosed with prostate cancer.
Conclusions: We demonstrated a correlation between periprostatic fat and serum levels of NGF and IL-6 among non-obese prostate cancer patients. These findings suggest that adipokines may be differentially secreted from visceral fat. Direct measurement of these molecules in the periprostatic fat would further our knowledge of the role of adipokines in prostate cancer.

MP-09.09

Heat Shock Protein 70 (HSP70) and FGFR3 in Non-muscle-invasive Bladder Cancer Treated with BCG: Gene and Protein Expression Analysis in Two Validation Cohorts

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Introduction and Objectives: We have shown that FGFR3 mutation and protein overexpression identifies pT1 bladder cancer (BC) patients with favorable disease characteristics. However, FGFR3 protein overexpression in the absence of a FGFR3 mutation was not associated with favourable disease characteristics. Heat shock proteins (HSPs) have been implicated in BC prognosis. Here, we evaluated FGFR3 and HSP70 expression at the gene and protein level and their relationship to pathological and clinical parameters using 2 cohorts of non muscle invasive BC treated with BCG.
Methods: 66 primary T1 and 12 Ta BC tumors treated at the University Health Network, Toronto were studied. Microarrays were built and HSP70 expression was determined by immunohistochemistry. Slides were co-reviewed with an experienced uro-pathologist with scores dependent on expression and intensity of the marker. Mutation status was examined by multiplex PCR-SNaPshot analysis. In the Seoul, South Korea cohort, 68 patients without tumor, 23 primary Ta, and 80 T1 BC were analyzed using microarray gene expression profiling and RT-PCR analysis.
Results: In Toronto, FGFR3 was mutated in 80% of Ta BC, 42% of T1LG and 21% of T1HG (p<0.05). Over 90% of Ta/T1 mutant FGFR3 overexpressed the protein, but also 50% of wild type overexpressed FGFR3. In Seoul, FGFR3 gene expression was significantly increased in normal vs. Ta BC (p=0.039) and normal vs. T1LG (p=0.0001). For HSP70, Kaplan-Meier analyses showed that the lack of HSP70 expression in Toronto and gene expression levels in Seoul were significant predictors for disease recurrence (p<0.05 and 0.015, respectively). HSP70 was shown to correlate with FGFR3 expression and mutation (p<0.05). FGFR3 and HSP70 had no influence on tumor progression.
Conclusions: In 2 BC cohorts, analyzing gene and protein expression status, both HSP70 and FGFR3 were shown to play an important prognostic role in T1BC identifying a group at lower risk of recurrence.

MP-09.10

NF-kappa B p65 as Prognostic Tool in Prostate Cancer: an Immunohistochemical Study from Biopsy Samples

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Introduction and Objectives: Our previous immunohistochemical studies of NF-κB p65 in prostate cancer (PCa) highlight its clinical potential as a prognostic marker in different cohorts of Canadian and European men. However these studies are essentially based on tissue microarrays built from samples obtained from radical prostatectomy specimens where other prognostic parameters, such as pathologic stage, Gleason score, and margin status are also available. However, limited prognostic parameters are available to clinicians at the time of diagnosis. The current study aims to assess whether the immunohistochemical staining of NF-κB p65 could offer prognostic information at the time of diagnosis and help risk stratify patients.
Methods: Prostate biopsies were obtained from a cohort of 328 PCa patients who were further treated by radical prostatectomy. NF-κB p65 was stained by immunochemistry on biopsy samples containing malignant tissue. The nuclear frequency was quantified as a percentage of positive NF-κB p65 nuclear cells.

Results: Our first statistical analyses revealed that the nuclear frequency of NF-κB p65 on biopsy samples was correlated with clinical paramaters as final Gleason score and BCR. Patients with Gleason score post-prostatectomy of 7 or more had a higher NF-κB p65 nuclear frequency in biopsy samples ($p<0.05$, Student test). NF-κB p65 nuclear frequency was also higher in patients developing a BCR and bone metastasis ($p<0.05$, Student test).
Conclusions: These preliminary results show an association between NF-κB p65 nuclear distribution in biopsy samples and PCa aggressivity. We showed that NF-κB p65 immunohistochemical staining on biopsies was predictive of BCR. NF-κB p65 may be prognostic marker at the time of diagnosis and could eventually be useful in clinical decision making.

MP-09.11

A New Molecular Imaging System Based on Both Transcriptional and Genomic Amplification to Detect Prostate Cancer Cells in vivo

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Introduction and Objectives: The ability to locate intraprostatic prostate cancer (PCa) is a clinical challenge. One technique to increase the specificity of PCa imaging is to interrogate the in vivo transcriptional activity of tumor-specific gene promoters associated with PCa by placing reporter genes under their control. Towards this end, our group has developed a transcriptional amplification system, termed TSTA,that has shown the ability to amplify the transcriptional activity of the PSA promoter 800-fold. In this study, we further improve the sensitivity of TSTA by combining two separate approaches: a transcriptional and a genomic amplification methods.
Methods: Two non-replicative reporter adenoviruses (Ad), and a conditionally-replicating Ad (CRAd) were constructed. The two non-replicative Ad expressed the firefly luciferase (FL) reporter gene using the TSTA system, under control of either the MUC-1 or the PSA promoter (MUC1-TSTA-FL or TSTA-FL). The CRAd was designed to express the viral early genes E1A and E1B under control of the PSA promoter (TSTA-E1) enabling PSA-dependent Ad replication.
Results: In vivo and in vitro,co-infection of PCa cells by TSTA-E1 and TSTA-FL (DTSTA) enhanced PSA-dependent bioluminescence by 25-fold when compared to TSTA-FL alone. This translates to approximately 20 000-fold amplification over native PSA promoter activity. Co-infection of the MUC1 promoter-driven TSTA (MUC1-TSTA-FL) with TSTA-E1, amplified FL signal exclusively in the AR+ LNCaP and LAPC4 PCa cells but not in the breast or liver carcinoma cell lines.
Conclusions: The DTSTA served to significantly enhance the transcriptional amplification of the TSTA system. A considerable advantage of this system lies with the idea that its specificity is directed by the transcriptional activity of two separate promoters, giving rise to the concept of a customizable gene amplification system for in vivo molecular imaging.

Unmoderated Posters

UP-001

Orthotopic Continent Urinary Diversion vs. Ileal Conduit: Comparison of Intraoperative and In-hospital Complications, Blood Transfusion, Length of Stay, and In-hospital Mortality

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Introduction and Objectives: Orthotopic continent urinary diversion (OCUD) after radical cystectomy (RC) may predispose to a higher rate of complications than ileal conduit urinary diversion (ICUD).

Methods: We identified all OCUD and ICUD patients in the Nationwide Inpatient Sample (NIS). We tabulated intraoperative and in-hospital complications, transfusion, length of stay, and in-hospital mortality rates according to urinary diversion. Multivariable analyses were performed, with adjustment for age, Charlson comorbidity Index (CCI), gender, race, hospital type and region, annual hospital volume tertiles, and year of surgery.

Results: The rate of OCUD was 8% vs. 92% for ICUD. Intraoperative and in-hospital complication rates were 2.5% vs. 2.6% (p=0.8) and 24.7% vs. 28.1% (p=0.04) for OCUD and ICUD patients, respectively. Blood transfusions were administered in 17.9% vs. 26.7% (p<0.001). Length of stay above median (≥9 days) was recorded in 53.5% vs. 54.9% (p=0.4). In-hospital mortality was 0.4% vs. 2.5% (p<0.001). After adjusting for all covariates, OCUD patients were less likely to receive a blood transfusion (odds ratio [OR]: 0.7, p<0.001), more likely to have an increased length of stay (OR: 1.3, p=0.002), and less likely to succumb to in-hospital mortality (OR: 0.3, p=0.03) relative to ICUD patients. Urinary diversion failed to achieve statistical significance for intraoperative (OR: 1.0, p=0.9) and in-hospital complications (OR: 1.0, p=0.8).

Conclusions: After RC, urinary diversion dictates no difference in intraoperative or in-hospital complications. However, fewer transfusions and a lower in-hospital mortality rate were recorded in OCUD patients. Therefore, broader use of OCUD after RC should be encouraged.

UP-002

Techniques and Agents Used to Conserve Blood During Radical Cystectomy: a Survey of the Society of Urologic Oncology

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Introduction and Objectives: Radical cystectomy may result in significant blood loss necessitating blood transfusions. The purpose of this study was to determine what intraoperative techniques and agents are currently used by uro-oncologists to prevent blood loss during radical cystectomy.

Methods: In August 2011, Society of Urologic Oncology members were solicited to complete an online survey. Respondents were asked to provide demographic information, state opinions on blood loss and transfusion, report techniques used to reduce blood loss and to estimate the proportion of cases where they used either systemic or local hemostatic agents.

Results: Residents, fellows, and non-urologists were excluded leaving 86 staff urologists who perform radical cystectomies. Of the 86, 73 (85%) had completed an uro-oncology fellowship in the United States, 57 (66%) had been in practice for over 6 years, and 68 (79%) perform over 10 cystectomies per year. Forty-nine (57%) of respondents estimated that transfusions were performed in over 20% of patients and 4 (5%) indicated that transfusions were performed in over 50% of patients. Few surgeons reported using CellSaver® (15;17%), autologous blood banking (16;19%), or acute normovolemic hemodilution (22;26%). Topical hemostatic agents were frequently administered with 61 (71%) utilizing oxidized cellulose polymer (Sugicel®), 23 (27%) absorbable gelatin sponge (Gelfoam ®), 44 (51%) gelatin and thrombin matrix (Floseal®), and 15 (17%) thrombin and calcium chloride (Tisseel®). Very few surgeons routinely used systemic anti-hemorrhagics with only 2 (2%) reporting use of factor VII (Novoseven®), 4 (5%) desmopressin (DDAVP®), 4 (5%) tranexamic acid (Cyclokapron®), and 0 (0%) to aminocaproic acid (Amicar®).

Conclusions: There is significant risk of blood loss requiring transfusion during radical cystectomy even among high volume uro-oncologists. Surgeons frequently use topical hemostatic agents and rarely use systemic anti-hemorrhagics.

UP-003

Should CT Urogram Be the First Radiological Investigation to Evaluate Visible Haematuria?

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Introduction and Objectives: General protocol for investigating visible haematuria patients are USS/IVU and flexible cystoscopy. However pooled sensitivity and specificity of CT urogram in diagnosis of urothelial tumors are 96% and 99% respectively (systematic review and meta-analysis EJR Feb 2010) which is better than IVU or USS. So CT urogram became the investigation of choice for visible haematuria at our haematuria clinic. The purpose of this study is to assess the effectiveness and outcome of CT urogram performed as the first radiological investigation for patients with visible haematuria.

Methods: This is a retrospective review of all CT urograms results at haematuria clinic from January 2009 to January 2010. Endoscopic findings were also noted in all patients.

Results: This study includes 266 patients with visible haematuria. A total of 76 patients had some abnormal urological findings in CT urogram (Table 1). 31 patients avoided flexible cystoscopy and proceeded directly for resection of bladder tumor/retrograde studies and ureteroscopy. 8 patients were referred to other clinicians for non-urological findings after normal flexible cystoscopy.

Conclusions: CT urogram should be the first line of imaging for visible haematuria as it avoids unnecessary investigations and helps plan effective management of haematuria patients.

Table 1. UP-003. CT urogram (n=266); abnormal CT urogram (n=76)

RCC	5 (1.87%)
Upper TCC	12 (4.51%)
Bladder TCC	33 (12.40%)
Stones	26 (9.77%)
Other diagnoses	8 (3%)

CT: computed tomography; RCC: renal cell carcinoma; TCC: transitional cell carcinoma.

UP-004

Laparoscopic Robot-assisted Radical Cysto-prostatectomy

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Introduction and Objectives: Radical cysto-prostatectomy is indicated for non-metastatic infiltrative transitional cell carcinoma of the bladder. During the procedure, an extended lymph node dissection is performed with a control of the vesical and prostatic pedicles, a dissection of the recto-vesical plan and urethral diversion. Due to the anatomic situation of these organs in the deep pelvis, the standart open procedure has an early postoperative morbidity that exceeds a 30% rate and a long length of stay.
Methods: A laparoscopic approach has been proposed for this procedure in order to limitate the per-operative blood loss and morbidity rate. It has been shown to be limited to experienced centres, due to the technical difficulty and demanding procedure. Robotic-assistance is an alternative of pure laparoscopic procedure and can be proposed to enhance the surgeon gesture in a limited anatomic area while keeping oncological safety.
Results: The video shows a step-by-step laparoscopic robot-assisted radical cysto-prostatectomy, with an extended lymp node dissection from the aorto-iliac bifurcation, external iliac, obturator and internal iliac dissection. The 3-D surgical vision offered by the DaVinci technology allows a perfect vision of the surgical dissection. Vesical pedicles are cliped at the origin of the internal iliac vessels, allowing a dry dissection with limited blood loss. The complete dissection of the bladder is shown, followed by the control of the Santorini pedicle, urethral and ureteral transections. At the end of the procedure, a running suture is placed on the posterior lip of the urethra to prepare the ileo-urethral anastomosis that will be performed after the construction of the neo-bladder performed in an open approach.
Conclusions: Radical cysto-prostatectomy can be performed with the same oncological safety than open procedure, equivalent procedure time and lower blood loss.

UP-005

Survival Impact of Postoperative Expenditures by High Volume Surgeons Following Definitive Surgery for Bladder Cancer

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Introduction and Objectives: Improved survival has been reported in high volume surgeons, but it is unknown whether variation exists in the outcomes of such surgeons based on surveillance patterns. We evaluated the postoperative expenditures of high volume surgeons and explored the association between these expenditures and survival.
Methods: Using SEER-Medicare records, we identified 2408 patients aged ≥66 years with bladder carcinoma treated with definitive surgery from 1992 to 2005. Surgeons were defined as high volume for performance of ≥10 cystectomies in the cohort. Geography and time (2005) standardized outpatient postoperative Medicare expenditures were evaluated for 2 years after surgery. High volume surgeons were stratified into quartiles by mean monthly postoperative expenditures, and survival for the quartiles was evaluated with the Kaplan-Meier method. Multivariable Cox proportional hazard regression models were used to estimate mortality hazard ratios by expenditure quartile.
Results: 29 of 833 surgeons were identified as high volume and had operated on 443 patients. Mean monthly postoperative expenditures by individual surgeon ranged from $41.19 to $181.73 amongst the high volume surgeons. No difference in cancer specific (p=0.30) or overall survival (p=0.09) was seen between the surgeon expenditure quartiles on Kaplan-Meier analysis. After adjusting for demographic, socioeconomic, comorbid, treatment, pathologic, hospital and surgeon factors no difference in mortality outcomes were seen between quartiles (Table 1).
Conclusions: In high volume surgeons, a broad range in postoperative management was observed, manifested by large differences in postoperative expenditures. Despite the increased cost of postoperative care, no difference in survival was seen between surgeon expenditure quartiles implying that improved outcomes in high volume surgeons may be more strongly related to the surgery itself than to strict postoperative surveillance.

Table 1. UP-005. Multivariate Cox proportional hazards regression analysis for bladder cancer mortality and overall mortality

Cancer Specific Mortality			
Postoperative Expenditure Quartile	**HR**	**95%CI**	***p* value**
Average Monthly Expenditures ≤$46.24	Referent	–	–
Average Monthly Expenditures $46.25-$61.58	0.29	0.08-1.04	0.06
Average Monthly Expenditures $61.59-68.09	0.48	0.20-1.14	0.10
Average Monthly Expenditures >$68.09	0.63	0.23-1.75	0.38
Overall Mortality			
Postoperative Expenditure Quartile	**HR**	**95%CI**	***p* value**
Average Monthly Expenditures ≤$46.24	Referent	–	–
Average Monthly Expenditures $46.25-$61.58	0.49	0.19-1.32	0.16
Average Monthly Expenditures $61.59-68.09	0.96	0.51-1.83	0.91
Average Monthly Expenditures >$68.09	0.90	0.40-2.00	0.79

CI: confidence interval; HR: hazard ratio.

UP-006

Is There a Role for the mTOR Pathway in Non-muscle Invasive Bladder Cancer?

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Introduction and Objectives: Non-muscle invasive bladder cancer (NMIBC) is associated with significant risk of recurrence and can progress to an invasive state. Numerous adjuvant intravesical therapies have been used in order to decrease the burden associated with this disease. The mammalian target of rapamycin (mTOR) pathway has been associated with oncogenesis in numerous cancers. We want to evaluate its implication in NMIBC and indirectly, its potential therapeutic role.
Methods: Immunohistochemical analyses were performed on first bladder tumors (BT) resected. We assessed mTOR overexpression with monoclonal antibodies. The different tumor specimens were classified according to staining percentage and intensity. Patients and tumors characteristics were reviewed from patients' charts. We attempted correlation of mTOR expression with clinical outcomes (recurrence and progression).
Results: BT with a high intensity staining were associated more often with T1 stage (47.4% vs. 21.6%, p=0.04) and higher grade (31.6% vs. 4.5%, p=0.0009) compared to BT with lower mTOR expression. The proportion of patients who experienced recurrence was more frequent in the high intensity expression group (84.2% vs. 65.9%, p=0.17) as was also the risk of progression (15.8% vs. 9.1%; p=0.41). These results are unfortunately not statistically significant at this point, and for this reason, this study is still ungoing with inclusion of more patients.
Conclusions: Our preliminary results have demonstrated a trend between mTOR overexpression and risk of recurrence and progression in NMIBC. We need to continue the analysis with more patients in order to ascertain this potential pronostic relation. Through this study, we also hope to provide a rationale for the potential mTOR inhibitors utilization in NIMBC.

UP-007

Meta-analysis of the Efficacy and Safety of Darifenacin and Other Anticholinergics for Managing Overactive Bladder

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Introduction and Objectives: Anticholinergics are frequently used to treat Overactive Bladder (OAB) symptoms which impacts quality of life (QoL). They cause adverse events, including dry mouth and constipation. The efficacy and safety of Darifenacin is reported to be similar to other anticholinergics with less cardio-vascular and cognitive adverse events (AE). Our objective was to conduct an updated meta-analysis comparing the efficacy, safety, and impact on QoL of Darifenacin and other anticholinergics (oxybutynin, tolterodine, solifenacin, and trospium chloride) for managing OAB.

Methods: The search was conducted by 2 independent researchers on Medline, Embase, and Cinhal to identify RCTs reporting safety (dry mouth, constipation, and withdrawals) and efficacy (urgency incontinence episodes, number of micturitions frequency, urgency and total incontinence episodes, and volume voided per micturition) of darifenacin and other anticholinergics. Each researcher extracted data independently. Discrepant results were settled through consensus discussion. The meta-analysis was performed using a random effects model.

Results: The literature search resulted in 1,280 citations of which 41 RCTs contained sufficient data for analysis including 3 Darifenacin RCTs (n=1226). All anticholinergics improved clinical outcomes from baseline with high responses to placebo. Trospium chloride and Darifenacin improved all efficacy outcomes compared to placebo. In addition Darifenacin improved QoL compared to placebo. All agents caused some dry mouth and constipation, with the lowest level of total withdrawals noted for Darifenacin.

Conclusions: This meta-analysis demonstrated that Darifenacin is similar in clinical efficacy and safety compared to other anticholinergics, but more effective in terms of QoL.

UP-008

Preoperative Sarcopenia Associated with Renal Function Outcomes in Patients Treated for Renal Masses by Extirpative Surgery

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Introduction and Objectives: Patients with solid tumors and severe skeletal muscle depletion (sarcopenia) have reduced survival. In renal transplants, sarcopenia predicts poorer post-transplant graft and patient survival. Preoperative body mass index (BMI) has been found to be an independent predictor of renal function post-nephrectomy. We hypothesize that sarcopenia may also predict renal function following surgery.

Methods: We examined the association between preoperative sarcopenia and postoperative estimated GFR (eGFR). Skeletal muscle area at the 3rd lumbar vertebrae was measured on computed tomography, and analyzed using Slice-O-Matic software. Cut-offs for sarcopenia were set as per standards in the literature. The primary outcome was change in a modified eGFR postoperative, calculated using the Modification of Diet in Renal Disease Study Group equation.

Results: Mean BMI of the sample was 30.1 and mean age was 62.7. Mean preoperative GFR was 91.5 in the sarcopenic patients. The group included 5 open and 13 laparoscopic radical nephrectomies. 10/18 (56%) were sarcopenic preoperative, revealing a high prevalence of sarcopenia in RCC patients. Mean change in 3 months eGFR was -30.2% and -27.5% in the sarcopenic and non-sarcopenic groups, respectively. Mean change in 12 months eGFR was -29.5% and -28.8% in the sarcopenic and non-sarcopenic groups, respectively. Unpaired t-test showed change in eGFR in the sarcopenic group greater than the non-sarcopenic, approaching significance (p=0.1). A trend between preoperative sarcopenia and decreased postoperative renal function is evident.

Conclusions: Preoperative sarcopenia may be a predictor of renal failure post-nephrectomy. Sarcopenic patients have a lower GFR postoperative. This pilot study is ongoing as we collect data on 100 more patients. With a larger sample, we expect to detect a statistically significant decrease in postoperative eGFR in sarcopenics. Goals of surgery for renal tumors include preservation of function, and thus a nephron-sparing approach could be applied to sarcopenics.

UP-009

Renal Tumor Ablation for pT1 Lesions: Patterns of Recurrence and Follow-up Recommendations

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Introduction and Objectives: Renal tumor ablation has gained popularity for the treatment of pT1 lesions. We seek to determine the pattern and frequency of recurrence to optimize follow-up.

Methods: We retrospectively analyzed the records of consecutive patients who underwent renal tumor ablation at our institution from 6/2004 to 6/2011. Patients who underwent percutaneous RFA and laparoscopic cryoablation were included. Follow-up imaging studies and clinical notes were reviewed to identify patients who failed therapy. Failure was defined as persistent contrast enhancement or requirement for an additional procedure.

Results: A total of 94 ablations performed in 87 patients with appropriate follow-up were included in our study. Of 65 percutaneous RFAs, there were 11 failures. The average tumor size for failures was 3.5 cm (range 1.5 – 5.5 cm). The average time to failure after treatment was 6 months (range 3-18 months). Failures were treated with repeat percutaneous RFA (6), partial nephrectomy (1) and no treatment (3). One patient developed biopsy proven metastases during follow-up. Of 29 laparoscopic cryoablations, there were 4 failures. The average tumor size for failures was 3.35 cm (2-4 cm). The average time to failure after treatment was 15 months (range 6 – 30 months). Failures were treated with percutaneous RFA (3) and nephrectomy (1). The overall failure rate was 16.9% for percutaneous RFA and 13.7% for laparoscopic cryoablation.

Conclusions: Failure of tumor ablation appears to occur early and in larger tumors suggesting technical failures rather than recurrent disease. We recommend follow-up consist of a CT scan at 6 months to document proper ablation and a second one at either 12 or 18 months from the time of treatment since most failures occur then and progression is rare. Longer intervals can be considered for patients with tumors less than 3 cm as failure in this group was less frequent.

UP-010

Cystatin C for Early Detection of Acute Kidney Injury after Laparoscopic Partial Nephrectomy

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Introduction and Objectives: Partial nephrectomy is the gold standard for the treatment of small renal tumors. Warm ischemia time is one the factor associated with kidney damage after partial nephrectomy but the safe clamping time is still unknown. There is a need to identify biomarkers that would improve the early detection of acute kidney injury (AKI). The objective of this study was to assess whether cystatin C levels obtained at specific timepoints during laparoscopic partial nephrectomy (LPN) could be early predictors of AKI.

Methods: Twenty-five patients participated in this study. Plasma samples were collected preoperatively, 5 min before clamping, 5, 20 and 120 min post-declamping and on the day following surgery. Plasma creatinine and cystatin C were measured by enzymatic and enzyme-linked immunosorbent assays, respectively. Associations between levels of cys-

tatin C, creatinine, and AKI-related data were measured using Pearson's correlation statistic.
Results: Clamping time varied between 16 and 44 minutes. Postoperatively, only four of the 25 patients had a 1.5 to 1.9-fold increase in serum creatinine from baseline and were identified with stage 1 AKI according to the AKIN classification. Postoperative cystatin C levels compared to baseline were increased in 13 (52%) of the patients. The differences between post- and preoperative cystatin C and creatinine values were highly correlated (r=0.7697; $p<0.0001$). Four patients had a ≥1.25-fold increase in cystatin C levels from baseline and three of these were stage I AKI patients. Intraoperative cystatin C levels were increased from baseline in 12 (48%) of the patients; however no association was found with parameters associated to AKI.
Conclusions: High increase in postoperative cystatin C levels from baseline may help identify patients with AKI following LPN. However, intraoperative cystatin C levels do not seem to be predictors of AKI in this small cohort of patients.

UP-011

Ex-vivo Partial Nephrectomy with Autotransplant to Treat Complex Renal Tumors: Case Report and Review of the Literature

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Introduction and Objectives: Nephron sparing surgery has become the gold standard for patients with tumors in solitary kidneys, bilateral renal masses, genetic renal masses, or patients with chronic renal dysfunction or risk of future renal impairment. We describe the use of nephrectomy followed by ex-vivo partial nephrectomy, bench renography, and then autotransplantation to treat a complex renal mass in a solitary kidney.
Methods: We present our case of management of a complex renal mass in a solitary kidney with 1 year follow-up. The medical literature for ex-vivo partial nephrectomy was then reviewed and analyzed.
Results: Radical nephrectomy was performed through a flank incision- and followed by immediate renal cooling and perfusion with Histidine-tryptophan-ketoglutarate solution, Ex-vivo partial nephrectomy and renography were then performed, followed by successful autotransplantation in the native renal bed. Cold ischemia time was less then forty minutes and warm ischemia time negligible. Estimated blood loss was 100 cc, with no intra-operative complications. Postoperative course was uneventful aside from a urinoma that resolved with drain placement. Preoperative Cr was 116 umol/L and peaked at 165 umol/L postoperatively. This patient is disease free with a stable creatinine of 130 umol/L at 1 year follow-up. In accordance with the limited number of reports in the literature, our experience suggests that good outcomes can be achieved with this technique.
Conclusions: Ex-vivo partial nephrectomy and autotransplantation is a viable option for patients with a complex renal mass in a solitary kidney. The ex-vivo nature of the procedure allows for excellent exposure, a bloodless field and complex renography.

UP-012

LKB1 Drives Adiponectin Receptor 1 Expression in Clear Cell Renal Cell Carcinoma: from Tumor Development to Disease Characteristics

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Introduction and Objectives: Evidence suggests that RCC development is linked to dysregulation of metabolic pathways. The AMPK/mTOR axis is the main energy-sensoring pathway, which, upon activation, results in mTOR inhibition. AMPK is regulated mainly by LKB1. We previously found that adiponectin, through its receptor AdipoR1, induces AMPK activation and consequently tumor suppression. We thus examined the status of AdipoR1 in ccRCC.
Methods: Specimens of ccRCC from 25 patients and their surrounding normal renal parenchyma (NRP) were analyzed for the expression of LKB1 and AdipoR1 by Western blot. A tissue microarray containing tissues from 239 ccRCC patients was stained for AdipoR1 or LKB1. Using ImageScope software, the staining intensity (H-score) was determined. Associations between AdipoR1 H-scores and tumor grade and stage were tested using linear regression. In vitro the AdipoR1-LKB1-AMPK pathway was examined using stable knockdowns of human ccRCC CRL-1932 cells for AdipoR1 or LKB1. Western blot was used to detect AMPK activation and mTOR inhibition.
Results: The expression of LKB1 was significantly reduced in ccRCC compared to NRP. AdipoR1 expression was lower (mean reduction 80%) in 24/25 ccRCC compared to NRP. Yet, the expression of both LKB1 and AdipoR1 correlated positively with tumor grade and stage. In vitro AdipoR1 protein expression in ccRCC cells was reduced with LKB1 knockdown. However, LKB1 expression was not reduced with AdipoR1 knockdown. Adiponectin-mediated AMPK activation and mTOR inhibition were disrupted with both AdipoR1 and LKB1 knockdown.
Conclusions: The expression of both AdipoR1 and LKB1 is critical for AMPK activation and mTOR inhibition. While ccRCC development was associated with lower LKB1 and hence AdipoR1 expression, the expression of these metabolic mediators correlated reciprocally with ccRCC grade and stage, once the tumor developed. Our results may be explained by compensatory metabolic changes occurring in tumor progression.

UP-013

Kidney Cancer Survivorship Survey: Gap Between Urologist and Survivor Perceptions

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Introduction and Objectives: The number of survivors with kidney cancer (KC) in Canada is growing as a result of increasing incidence, earlier diagnosis and improvements in therapy. Yet, the recently published "Investment in Research on Survivorship and Palliative and End-of-Life Care", reported no investment in KC survivorship research between 2005-2008. Kidney Cancer Canada (KCC) has conducted the first Canadian KC survivorship survey. The availability of information pertaining to survivorship, the extent to which it is communicated to patients and the interest in more formalized survivorship care plans were the focus of the survey.
Methods: Two comparable, online surveys (one for physicians and another for patient/caregivers) were developed to measure knowledge levels regarding KC survivorship issues. Urologists and patient/caregivers across Canada were invited to participate. Forty urologists, 276 KC patients and 45 caregivers of KC patients diagnosed at stages 1 through 3 completed surveys.
Results: Urologists reported that they communicated information regarding stage (100%), grade (98%), tumor size (85%) and cell subtype (83%) to their KC patients. In contrast, KC patients/caregivers reported much lower rates for receiving information on their stage (62%), grade (53%), tumor size (80%) and cell type (63%). Furthermore, nearly half (46%) of those affected by KC reported that they received no information from their urologist about possible adverse effects of treatment such as increased risks of chronic kidney disease or hypertension. However, both groups supported the need for a medically endorsed website that would provide patients with an individualized survivorship care plan.
Conclusions: KCC's Survey has identified a gap between Canadian urologist and KC survivor/caregiver perceptions about the provision of perioperative information. However, both groups supported the development of a kidney cancer survivorship care plan.

UP-014

Comparison of Renal Function Outcomes Between Laparoscopic Partial Nephrectomy with Early Unclamping versus Laparoscopic Partial Nephrectomy with Zero Ischemia

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Introduction and Objectives: Limiting warm vascular occlusion time to less than 20-30 minutes during partial nephrectomy is vital to minimize renal ischemic damage. Although, both early unclamping and zero ischemic partial nephrectomy can achieve this time-restraint, only limited data exists comparing their renal function outcomes. We aim to compare renal function outcomes of these two approaches by measuring pre- and postoperative eGFR and post operative MAG 3 renal scans.

Methods: Between September 2009 to October 2011, 34 consecutive patients underwent laparoscopic partial nephrectomy with early unclamping with mean clamp time of 19.04 minutes. This was followed by 30 consecutives patients undergoing laparoscopic partial nephrectomy with zero ischemia. All cases were performed by a single surgeon. We retrospectively reviewed records of all 64 patients. Patients with solitary kidneys and patients with significant renal parenchyma disparity on preop CT scan were excluded from the study. Demographics, tumor pathology, surgical margins, perioperative complications, pre- and postoperative eGFR and postoperative MAG 3 Scans were compared between both groups.

Results: See Table 1.

Conclusions: Although no statistically significant differences were found, the difference between the two groups was more profound for the MAG 3 Scan variables. Associated r-values show small to medium-sized effects in this regard, which point towards a trend of improved renal function preservation in the zero ischemic group. Larger multicentre trials are required for future research in this area.

UP-015

Reduction of Renal Parenchymal Volume and Renal Function in Patients after Partial Nephrectomy for Renal Cell Carcinoma (RCC)

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Introduction and Objectives: Nephrectomy and partial nephrectomy (PN) for early-stage RCC produce similar oncological outcomes. However, the loss of normal kidney tissue, or renal parenchymal volume (RPV) may increase the risk of renal dysfunction. The use of PN is increasing and the extent of renal dysfunction attributable to RPV loss is not fully understood.

Methods: 31 patients who underwent PN for RCC at the University Health Network were retrospectively studied. Demographic, surgical, and renal functional data were extracted from patient charts. Glomerular filtration rate (GFR) was estimated using the Modification of Diet in Renal Disease (MDRD) equation and plasma creatinine concentrations. Changes in pre- and postoperative GFR were quantified (ΔGFR). RPV loss (ΔRPV) was determined using pre- and postoperative CT or MR scans on Vitrea volumetric software. Non-tumor kidney tissue on each axial slice was manually traced. A correlation between ΔRPV and ΔGFR was assessed.

Results: There were 18 males and 13 females with a mean age of 57 years (range 28-80). Mean tumor diameter was 3.6 cm (range 1.3-7.5). Mean pre- and postoperative RPV was 160.9 (±33.7, range 81.4-229.5) and 144.2 mL (±36.8, range 61.6-199.8), respectively. Mean ΔRPV was -10.6% (±14.8) or -16.7 mL (±25.1, range -87.1-25.1). Mean preoperative GFR was 86.3 ml/min/1.73m^2 (±20.1, range 53.2-128.3). Twelve months postoperatively, mean GFR was 80.1 ml/min/1.73m^2 (±26.5, range 37.7-144.91). Mean ΔGFR was -8.1% (±20.9) or -6.6 ml/min/1.73m^2 (±18.1, range -68.6-25.4). Using a linear regression, we found no correlation between ΔRPV and ΔGFR (r^2=.002, p=0.812).

Conclusions: PN does lead to renal dysfunction, but RPV loss does not fully account for this. We found no correlation between ΔRPV and ΔGFR. Patient comorbidity, ischemia/reperfusion injury, and compensatory renal reserve may have a larger impact on GFR than minimal loss of RPV with PN. We are increasing our sample to further explore this relationship.

UP-016

Results of a Survey on the Management of Upper Tract Urothelial Cancer

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Introduction and Objectives: The importance of regional lymphadenectomy has been well established in the management of bladder cancer. Considerable uncertainty exists regarding its role and utility in the treatment of upper urinary tract transitional cell carcinoma (UTTCC). A recent study has showed that the incidence of lymphatic involvement varied according to stage and grade. Our objective is to survey, study, examine and discuss the current management of UTTCC in Canada. Specically, what are the current practices for the management of UTTCC and when do we utilize lymphadenectomy?

Methods: A 6-page survey was created and sent electronically to all Canadian Urological Association (CUA) members. Data collected include physician demographics, UTTCC management practices and current practices for monitoring tumor recurrence and postoperative renal function. We studied the current practices for the management of UTTCC with a specific focus on lymphadenectomy. Moreover, we will also compile and evaluate data based on the current practices for monitoring tumor recurrence and postoperative renal function.

Results: A total of 27 urologists responded. 32% of respondents would do a lymphadenectomy for Ta/Tis/T1 disease and 64% would do a lymphadenectomy for T2 or greater disease. If presented with survival data favoring Retroperitoneal Lymph Node Dissection (RPLND) for Ta/Tis/T1 disease, 55% would change their management and 86% would change their management for T2 disease.

Table 1. UP-014

	Ischemic (N=32)	Nonischemic (N=31)	*p*-value	*r*-value
	Mean ± SD	Mean ± SD		
Preoperative eGFR	75.9 ± 20.5	75.3 ± 19.5	0.91	0.01
Postoperative eGFR	78.4 ± 26.4	78.9 ± 25.3	0.95	0.01
Change in eGFR	-2.5 ± 15.1	-3.5 ±13.7	0.78	0.08
MAG 3 Scan				
Relative contribution of operated kidney (%)	39.3 ± 8.5	42.3 ± 7.8	0.17	0.18
Preserved renal fuction in operated kidney (%)	67.6 ± 21.9	76.2 ± 25.5	0.18	0.19

SD: standard deviation; eGFR: estimated glomerular filtration rate.

Conclusions: Clearly, there is much debate over role of lymphadenectomy in this disease. The relatively low frequency of these lesions and the lack of prospective randomized trials do not permit absolute conclusions about treatment impact on outcomes. Furthermore, it is questionable whether a randomized controlled trial is feasible. Overall, our results suggest the need for a well-defined role for role of lymphadenectomy in the management of upper tract urothelial carcinoma.

UP-017

Management of Collecting Duct Carcinoma: a Systematic Review, Management Approach, and Case Series

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Introduction and Objectives: Collecting duct carcinoma (CDC) is a rare subtype of renal carcinoma. It is aggressive, presents symptomatically at an advanced stage, and has a poor prognosis. Little is known on what constitutes optimal management of CDC. The aim of this study is to develop an evidence-based approach to managing CDC.

Methods: Ovid Medline, The Cochrane Library, EMBASE, MacPLUS FS and conference proceedings (via Web of Science) were searched to identify studies relevant to the management of CDC. A systematic search strategy was developed and applied. Included studies had a minimum of 10 subjects receiving a single intervention. Series in which an evaluation of therapeutic effectiveness was not possible were excluded. An algorithm based on this review for approaching multidisciplinary CDC management is then presented. Four consecutive cases of CDC treated at our tertiary institution between 2006 and 2010 are then related to this algorithm.

Results: Our systematic review identified 3 studies relevant to the management of CDC. Firstly, a gemcitabine/cisplatin or carboplatin (GC) regimen resulted in a 26% partial or complete response rate in a phase II study of 23 patients with metastatic CDC. Two additional studies indicated that 49 patients treated with immunotherapy achieved no response. A management algorithm based on these findings is presented in Figure 1. Four cases of advanced CDC are then reported. Two patients were unresponsive to MVAC therapy. Cytoreductive nephrectomy (CN) was performed in 2 patients. Performance status and survival were uniformly poor. Management of these cases in relation to our algorithm (Fig. 1) is discussed.

Conclusions: CDC responds to systemic therapy similarly to urothelial carcinoma. Our review suggests that the current standard of care for metastatic CDC is a (GC) regimen. A framework for applying CDC management principles and considering CN based on this review is provided and applied to the 4 reported cases.

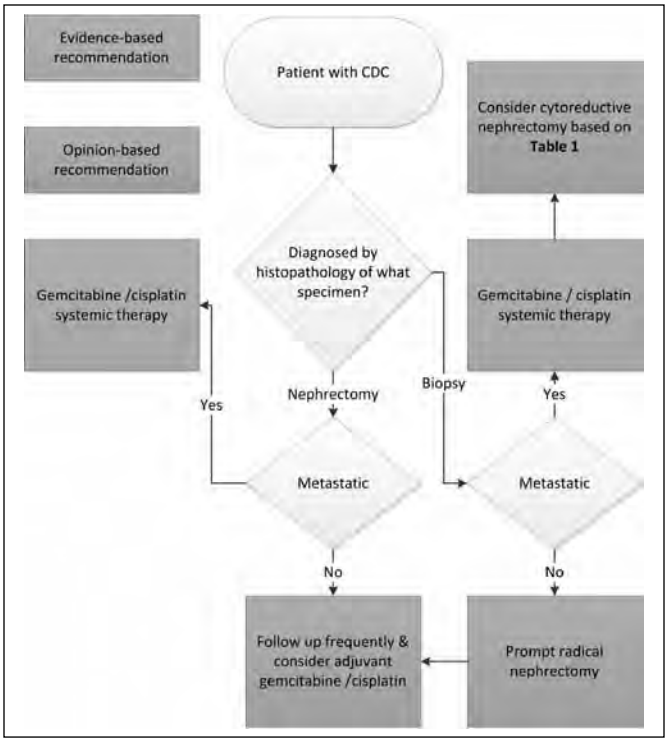

Fig. 1. UP-017.

UP-018 – WITHDRAWN

UP-019

Improving Outcomes Through the Development of Quality Indicators (QI) in Renal Cell Cancer (RCC)

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Introduction and Objectives: Optimal quality of care is needed for ideal outcomes, and QI are used to measure quality of care. In RCC, there is a lack of information defining such optimal care. This is especially important as RCC care becomes more complex, with ongoing advances requiring greater expertise. The goal of the study was to identify QI for RCC across the disease spectrum from presentation to palliation.

Methods: A multidisciplinary expert panel of 13 urologic and medical oncologists from across Canada reviewed potential QI. These QI were identified from a systematic literature review. Panel members were also asked to suggest additional potential QI. A modified Delphi technique was used to select QI that were relevant and practical to RCC; this technique incorporated 2 email questionnaires and 1 in-person meeting.

Results: From 233 literature citations, 34 possible QI were identified; 24 additional potential QI were suggested. A final set of 23 QI was established. These are distributed across the RCC disease spectrum as follows (number of QI in parentheses): screening (1), diagnosis/prognosis (3), surgical management of localized disease (6), surgical management of advanced disease (3), systemic therapy (5), and follow-up (3). These 21 QI focused mostly on the treatment of RCC. In addition, two QI related to survival outcomes (overall and progression-free) were selected. Examples of QI include: the proportion of patients undergoing partial nephrectomy for tumors <4 cm and the proportion of patients with advanced disease who are assessed by a multidisciplinary genitourinary cancer team. The final 23 QI selected will be presented in detail.

Conclusions: A systematic, consensus-based approach was used to determine relevant QI in RCC care. These 23 QIs will provide a means of evaluating the quality of RCC care in an effort to improve outcomes in our patients. The next step will be to establish a means of measuring each of these QI based on defined or yet to be defined benchmarks.

UP-020

Rising Incidence of Upper Tract TCC (UTTCC) in Kettering, United Kingdom

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Introduction and Objectives: Tumors of the renal pelvis are rare and account for approximately 10% of all renal tumors and approximately 5% of all urothelial tumors. Ureteral tumors are even more uncommon, occurring with one quarter the frequency of renal pelvis tumors. In our hospital we experienced rising incidence of UTTCC as well increase in ureteric TCC. To confirm this we retrospectively analysed the data.

Methods: We collected our data retrospectively from 2005 to August 2011.The cases were identified via theatre, histopathology and MDT meeting records. We analyzed known risk factors, investigations, treatment, final histology and associated bladder tumor.

Results: Total of 41 patient were diagnosed with UTTCC between 2005 to March 2011.Most of the patients were male (33) with male to female ratio of approx 8:1. Mean age at Ist presentation was 64 years (range 42 to 92 years). Most of the patients were either smoking actively or had stopped smoking (n=28). The analysis revealed rising incidence of UTTCC in Kettering as shown in table form. Of note we also recorded rising incidence of Ureteric TCC then pelvic TCC in these patients.

Conclusions: Our project showed rising incidences of UTTCC especially ureteric tumors. We postulate the rising trend could be secondary to combination of strong presence of leather and service industries in Kettering area or secondary to improved diagnostics tests.

UP-021

The Fer Kinase, a Nuclear Effector of Growth-promoting Factors Favoring Castration-resistant Prostate Cancer

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Introduction and Objectives: Death from prostate cancer (PC) arises from castration-resistant (CR) metastatic disease, developing from an increasing cell ability to survive and thrive in response to a variety of growth-promoting factors (GFs) signaling through tyrosine kinases (TKs). The androgen receptor (AR) itself has appeared as a TK substrate in PC cells responding to epidermal growth factor (EGF), interleukin (IL)-6 and even androgens. As we reported that the Fer TK controls IL-6 signaling, we aimed to verify if Fer further contributes to aberrant signaling by additional GFs controlling AR activation in PC.

Methods: LNCaP cell survival/growth and death were measured by MTT assays and propidium iodide (PI) staining, respectively. Fer down-regulation was achieved via siRNAs and PSA was measured by Real Time PCR. Tyrosine (Y) phophorylation, protein interactions and cellular localization were assessed.

Results: Fer was responsible for the LNCaP cell response to IL-6, since fer siRNA reduced growth by 90%. Fer also controlled 50%, 44%, 36% and 32% of the response to FBS (fetal bovine serum), R1881 (androgens), Insulin-like (I) GF-1 and EGF, respectively. Fer knockdown also resulted in 40% less cells when cultured without growth stimuli. Cell death was confirmed by PI staining. Moreover the full R1881 and IL-6 PSA response depended on Fer. IL-6 and R1881 were most potent to increase Fer and AR pY-levels along with their nuclear accumulation as observed in prostate tumors. AR pY-levels were modulated by Fer, both within cells and in kinase assays. Finally, Y223 appeared as a novel functional site preferred by the Fer TK and this AR motif was involved in the interaction with the Fer-SH2 domain.

Conclusions: The up-regulated nuclear Fer in PC appears to intervene in pathways triggered by several GFs contributing to aberrant signaling in CRPC.

UP-022

Single Photon Emission Computed Tomography/CT Imaging of Metastases Using Prostate Specific Membrane Antigen Antibody

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Introduction and Objectives: Current imaging methods to detect prostate cancer (PC) metastases (mets) lack sensitivity and specificity. Reliable cancer-imaging modalities are needed. Prostate Specific Membrane Antigen (PSMA) is an attractive target for molecular imaging in virtue of its distribution and overexpression in castrate-resistant (CR) PC. We aimed to test a labeled monoclonal antibody (mAb) directed against an extracellular subdomain of human and canine PSMA to detect mets in the dog prostate cancer (DPC)-1 model by single photon emission computed tomography (SPECT)/CT imaging.

Methods: DPC-1 cells were implanted in immuno-suppressed (cyclosporine) dogs (n=5). SPECT/CT was repeated during follow-up, 2 days after i.v. injection of ^{111}Indium(In)-PSMA mouse mAb. In some instances, bone scan (^{99m}Tc-MDP) was performed. Controls included imaging prior (^{99m}Tc-MDP, ^{111}In-PSMA) and post (^{111}In-mouse immunoglobulins) DPC-1 implantation. The prostate, sacroiliac lymph nodes (LNs), lungs and selected bone segments were harvested for gamma counting and pathological analyses.

Results: Four dogs developed prostate tumors and mets in LNs and lungs; 3 had bone mets. SPECT revealed uptake of ^{111}In-PSMA radiotracer in mets, yet DPC-1 tumors in the prostate remained negative. Mets were imaged as early as by 6-8 weeks and grew during follow-up. CT fusion images indicated enlarged LNs, often necrotic at necropsy, and for which tracer accumulation and tumor positivity were confirmed. Uptake of radiotracer was also detected in lungs and bones (one case studied), confirming a positive bone scan. Controls were negative.

Conclusions: Molecular imaging by SPECT/CT with ^{111}In-PSMA radiotracer was proven efficient and specific to detect soft tissue and bone mets in the pre-clinical DPC-1 model closely mimicking CRPC, implying feasibility in the clinical setting.

UP-023

PSA Bounce Following Prostate Brachytherapy for Clinically Localized Prostate Adenocarcinoma: a Single Institution Study with Minimum Three Years Follow-up

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Introduction and Objectives: Prostate specific antigen (PSA) is a sensitive serological marker of outcome following prostate brachytherapy. Following brachytherapy, PSA levels may transiently rise in a phenomenon known as PSA bounce (PB). We report on PB following permanent radio-iodine (^{125}I) brachytherapy and correlate PB with both clinical and dosimetric variables.

Methods: We analyzed 145 patients with clinically localized, T1-2c N0 M0 prostate adenocarcinoma treated with brachytherapy with a minimum follow-up of 3 years. Six different PSA thresholds were used to define PB: a increase of ≥0.1 ng/ml (definition I), ≥0.2 ng/ml (definition II), ≥0.3 (definition III) ng/ml, ≥0.4 ng/ml (definition IV), ≥0.5 ng/ml (definition V) and ≥1.0 ng/ml (definition VI) with spontaneous return to ≤pre-bounce levels. Biochemical failure (BF) was defined according to the American Society for Therapeutic Radiology and Oncology Phoenix definition of a rise of ≥2 ng/mL above the nadir.

Results: The median follow-up was 52.2 months (range: 36.1 — 74.8 months). Using definitions I, II, III, IV, V and VI, a PB occurred in 44%, 35%, 29, 25%, 19% and 4% of patients respectively. The mean time until PB was 14.8 — 16.4 months, the duration was 18.9 — 22.5 months, and the magnitude was 0.7 — 3.2 ng/mL. BF occurred in 15 patients (10.3%) and was detected in 6.3%, 7.8%, 9.5%, 8.3%, 10.7% and 33.3% of PB

patients using definitions I, II, III, IV, V and VI respectively. Nine patients (6.2%) had true failure. All definitions of PB occurred earlier than BF (p<0.05). Univariate and multivariate analysis revealed that age <65 and Gleason sum ≤6, were statistically significant predictors of PSA bounce for all definitions, and percent positive biopsies (<25%) for definitions I to IV.
Conclusions: PB is a common phenomenon post-brachytherapy. Age <65, Gleason sum 6 and lower volume disease are predictors of PB. The time to first PSA rise can help to distinguish between PB and BF.

UP-024

Is Perineural Invasion in Prostate Biopsies Associated with Adverse Pathological Outcomes? Old Paradigm Revisited

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Introduction and Objectives: To determine the role of perineural invasion (PNI) on prostate biopsy in predicting adverse findings at radical prostatectomy in a recent cohort of screen detected prostate cancer.
Methods: We analyzed 1041 consecutive patients from a prospectively maintained database. Prostate cancer was diagnosed in 470, and 138 of these patients underwent radical prostatectomy. Pathological specimens were examined, and perineural invasion was identified as carcinoma tracking along or around a nerve in the perineural space. We investigated the predictive value of PNI on biopsy with PNI on radical prostatectomy as well as the ability of PNI on prostate biopsy to predict adverse findings at radical prostatectomy.
Results: Perineural invasion was present in 124 (26%) of biopsy specimens diagnosed with prostate cancer and 38 (27%) of those who chose radical prostatectomy. Perineural invasion on prostate needle biopsy was not predictive of radical prostatectomy Gleason score (p=0.377), pathological stage (p=0.852), extraprostatic extension (p=0.258), surgical margin (p=0.079), lymphovascular invasion (p=0.499) , and upgrading (p=0.514) or downgrading (p=0.208) at radical prostatectomy. The sensitivity, specificity, positive predictive value, and negative predictive value of PNI on biopsy for PNI on radical prostatectomy were 32%, 82%, 79%, and 37% respectively. The Cohen's Kappa correlation coefficient was 0.11.
Conclusions: Perineural invasion on prostate needle biopsy is not predictive of radical prostatectomy outcome. Furthermore, perineural invasion on biopsy has limited predictive value for perineural invasion at radical prostatectomy.

UP-025

The Association between Male Pattern Baldness and Second to Forth Finger Ratio with Prostate Cancer: A Prospective Cohort Study

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Introduction and Objectives: Retrospective case control studies have demonstrated an association between male pattern baldness and 2D:4D ratio and prostate cancer. The aim of this study was to validate these findings in a prospective cohort.
Methods: Upon approval from our ethical review board we prospectively enrolled 196 consecutive patients referred to a prostate biopsy. Finger lengths were measured using a digital vernier calliper, and the 2D:4D ratio was calculated. Male pattern baldness was assessed on a scale of 0-4 using the standardized Norwood classification (0= no balding, 1= frontal balding, 2= Mild vortex, 3=moderate vortex and 4=severe vortex). We performed all measurements prior to the biopsy thus blinded to the pathology outcome. We used Univariable and multivariable analysis to associate 2D:4D ratio and male pattern baldness with prostate cancer. The multivariable model included the two main predictors (male pattern baldness and 2D:4D ratio) as well age, digital rectal examination and PSA.
Results: The median (IQR) age and PSA of our cohort was 64 (59-70) and 5.8 (4.1-8.4), respectively. Overall 109 patients (55%) were diagnosed with prostate cancer. On univariable analysis male pattern baldness was associated with prostate cancer (p for trend=0.03). However 2D:4D ratio was not. On multivariable analysis male pattern baldness remained a significant predictor of prostate cancer. Furthermore, we noted a dose response effect- the more severe balding patterns were more strongly associated with prostate cancer (Frontal balding OR 2.0 (95%CI 1.1-6.6); mild vortex OR 2.1 (95%CI 1.5-5.2); moderate vortex OR 2.5 (95%CI 1.2-7.1); severe vortex OR 2.9 (95%CI 1.1-4.3).
Conclusions: In a prospective cohort we found that male pattern baldness was an independent predictor of prostate cancer. Further studies are needed in order to assess whether the inclusion of male pattern baldness can contribute to existing models to predict prostate cancer prior to biopsy.

UP-026

Coexisting Prostate Cancer Found at the Time of Holmium Laser Enucleation of the Prostate for Benign Prostatic Hyperplasia: Predicting Its Presence and Grade in Analyzed Tissue

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Introduction and Objectives: Since 1996, HoLEP has been a well-accepted surgical option for benign prostatic hyperplasia, mimicking anatomic results of open prostatectomy with removal of the entire transition zone. A portion of these men will harbor prostate cancer (PCa) in their analyzed tissue and may go on to subsequent therapy. Establishing risk factors for PCa at the time of HoLEP may aid in preoperative patient counseling. Our study identifies patients with PCa in a large cohort of men undergoing HoLEP and attempts to identify usable variables to predict either PCa or Gleason score at the time of surgery.
Methods: We performed a retrospective data analysis of HoLEP patients at a single institution between 1998 and 2011. At the discretion of the referring urologist, patients with elevated PSAs and/or abnormal digital rectal exams had prior negative preoperative biopsies. Different preoperative and postoperative variables were examined using univariate and multivariate logistic and linear regression models.
Results: Overall, of 1226 HoLEP patients, 109 (8.9%) had PCa found on tissue analysis (Table 1). Almost ¾ of diagnosed PCa was low grade (≤Gleason 6). After univariate and multivariate analysis, only age and weight of specimen were found to predict the presence of PCa (Table 2). More specifically, the risk of PCa increased with increasing age and decreasing gland size. Only rising PSA was predictive of higher Gleason scores on mulitivariate analysis at the time of HoLEP (Table 3).

Table 1. UP-026. Holmium laser enucleation of the prostate: patient characteristics

	Benign	Malignant	
N	1117	109	
Mean age	70.1	75.0	p<0.001
Mean PSA	7.2	9.0	p=0.08
Mean preoperative TRUS volume	102.3	85.8	p=0.01
Mean specimen weight	80.5	64.2	p=0.04
Gleason score*			
≤6	N/A	75 (72.1%)	
7	N/A	15 (14.4%)	
≤8	N/A	14 (13.5%)	

*5 missing values for Gleason score. ; TRUS: transrectal ultrasound; PSA: prostate-specific antigen.

Table 2. UP-026. Univariate and multivariate analyses predicting presence of cancer

	Malignancy
Univariate	
Age	1.08 (p<0.001)
PSA	1.01 (p=0.1)
Weight of specimen	0.99 (p=0.004)
Preoperative TRUS volume	0.99 (p=0.03)
History of biopsy	0.93 (p=0.85)
Multivariate	
Age	1.09 (p<0.001)
PSA	1.02 (p=0.14)
Weight of specimen	0.99 (p=0.01)
Preoperative TRUS volume	1.0 (p=0.97)
History of biopsy	1.62 (p=0.25)

TRUS: transrectal ultrasound; PSA: prostate-specific antigen.

Table 3. UP-026. Univariate and multivariate analysis predicting Gleason Score

	Gleason Score
Univariate	
Age	0.2 (p=0.05)
PSA	0.29 (p=0.04)
Weight of specimen	-0.16 (p=0.1)
Preoperative TRUS volume	-0.15 (p=0.21)
History of biopsy	-0.07 (p=0.5)
Multivariate	
Age	1.49 (p=0.14)
PSA	0.31 (p=0.01)
Weight of specimen	-0.36 (p=0.14)
Preoperative TRUS volume	0.17 (p=0.47)
History of biopsy	-0.01 (p=0.9)

TRUS: transrectal ultrasound; PSA: prostate-specific antigen.

Conclusions: The coexistence of PCa found at the time of HoLEP is low and the majority of patients with cancer will have low grade disease. Older patients with smaller glands appear to be at the highest risk of harboring PCa. In this group of patients only preoperative PSA values appears to influence the presence of more aggressive disease.

UP-027

Prostate Cancer Screening: Attitudes and Practices of Family Physicians in Ontario

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Introduction and Objectives: The utility of prostate cancer (PCa) screening is controversial. We sought to determine whether family physicians in Ontario, Canada, believe PCa screening is beneficial and to characterize their screening protocols.

Methods: A survey was developed with input from urologists, family physicians, and the Ontario Medical Association's Section on General and Family Practice. Questions covered three domains: demographics, beliefs about screening utility and screening practices. All 7,302 family physicians in Ontario were invited by email to complete the online survey.

Results: A total of 969 physicians completed the survey; 955 (52.0% male, 48.0% female) were included. Most (78.9%) use PSA and DRE for screening; 9.1% use DRE alone and 7.0% PSA; 2.4% incorporate transrectal ultrasound. 8.3% do not offer PCa screening. Most physicians begin offering screening at age 50 (72.9%) and stop at ages 70 or 80 (68.4%); 4.3% offer screening up to age 90 and 17.9% offer lifelong screening. 54% offer the same amount of screening as they did 5 years ago, while

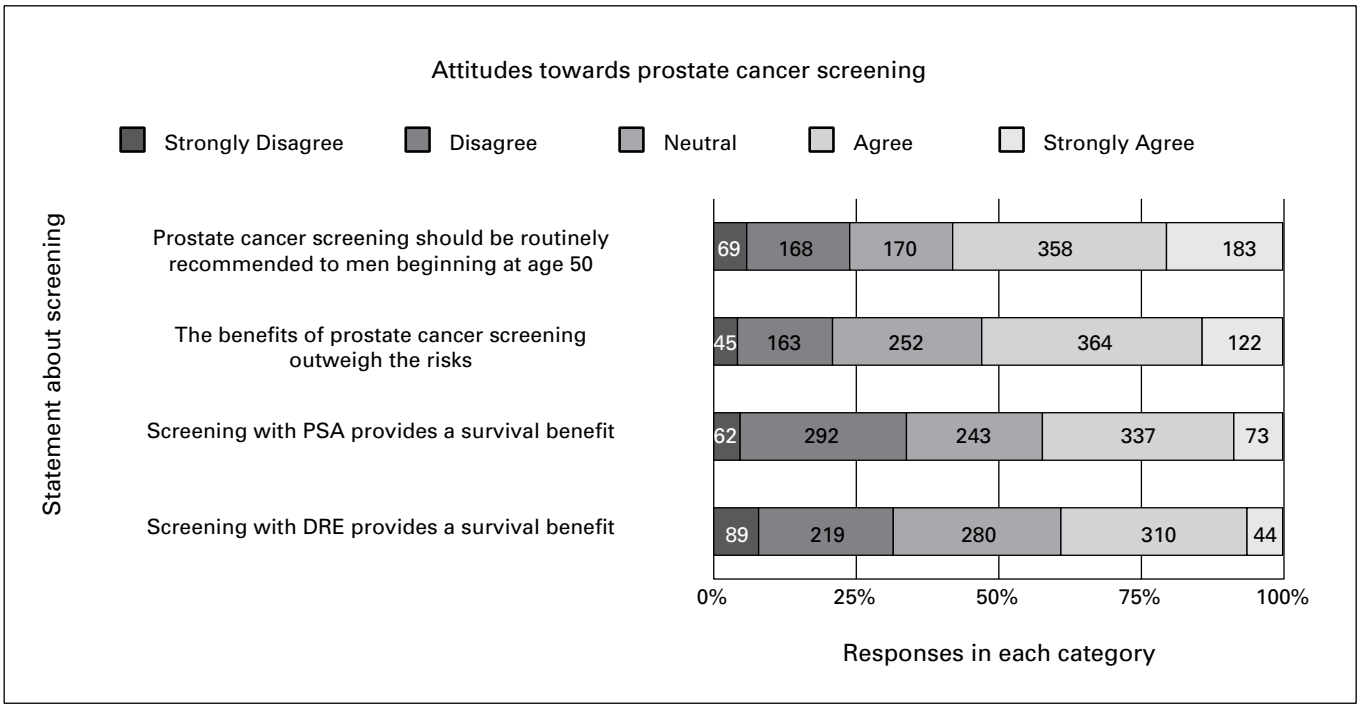

Fig. 1. UP-027. PSA: prostate-specific antigen; DRE: digital rectal examination.

19.5% offer more and 13.8% less. Physician beliefs about the utility of PCa screening are shown in Fig. 1.
Conclusions: Although 91.3% of respondents offer PCa screening, they are divided over its utility, with only 51.4% convinced that the benefits outweigh the harms. The publications in 2009 of two large randomized controlled trials had a negligible impact on the amount of screening performed by respondents. There is significant variability between physicians' screening beliefs and protocols. A limitation of this study is the possibility of selection bias. Nevertheless, this is the largest sample of Ontario family physicians ever surveyed about PCa screening and highlights divergent physician practices and a need for more conclusive evidence on the subject of screening utility.

UP-028

Transrectal Ultrasound with Vibroelastography for the Detection of Prostate Cancer

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Introduction and Objectives: Vibro-elastography (VE) is a promising technique for imaging soft tissues and relies upon measuring tissue strain in response to a mechanical excitation. The aim of this study is to evaluate the feasibility of detecting cancer within the prostate from VE images.
Methods: Transrectal ultrasound with VE was performed intra-operatively, prior to the prostatectomy, on patients diagnosed with prostate cancer. Transfer function images of the prostate, showing the relative stiffness of the tissue within and surrounding the prostate were created. For each case, 9-13 pathology slides extracted from the prostate at approximately 4-mm intervals, with cancer marked, were available. Areas suspected for cancer were marked on the VE images and then compared to the pathology results.
Results: These are preliminary results on 5 patients. Analysis is pending on 5 other patients and recruitment will continue in the coming months. Gleason scores for 51 cancerous areas were available. Twenty of the 31 tumors with Gleason scores of 3+3 (64.5%), 13 of the 16 tumors with Gleason scores of 3+4 (81.25%), both tumors with Gleason scores of 4+3 with tertiary 5 (100%) and both tumors with Gleason scores of 4+5 (100%) were detected. For example, in Figure 1, a tumor of Gleason score 3+4 is identified. The tumor is 12 mm by 6 mm and has an area of 60 mm2. Overall, VE had a sensitivity of 72.5% for detecting prostate cancer, with a false negative and a false positive percentage of 24.4% and 37.3% respectively. The sensitivity of VE for detecting cancer increased as the Gleason score increased, with a sensitivity of 85% for tumors with a Gleason score of 7 and above.
Conclusions: This study shows that the use of additional information from VE has the potential of improving the detection of prostate cancer, especially for cancers of higher grade. This imaging method could aid prostate biopsy by highlighting areas suspicious for cancer, reducing the need for repeated biopsy procedures.

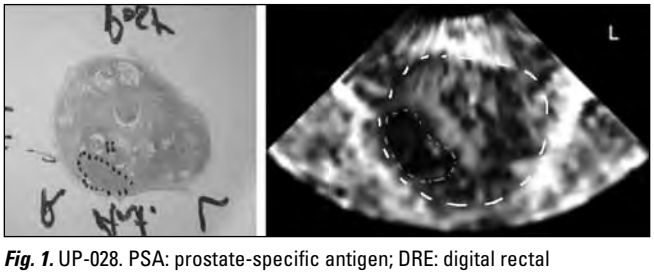

Fig. 1. UP-028. PSA: prostate-specific antigen; DRE: digital rectal examination.

UP-029

Human Prostate Cancer Magnetic Resonance Elastography and Correlation with Histology

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Introduction and Objectives: The aim of this study is to use magnetic resonance elastography (MRE) methods to identify cancerous tumors of the prostate and correlate them to the whole mount histopathology marked with the Gleason score.
Methods: Ethics board approval and informed consent was obtained from a patient (first in study of N=20) of age 61 scheduled for radical prostatectomy. The experiments were performed on a 3T Achieva scanner. The vibrations were applied to the perineum using a custom made electromagnetic driver. For the anatomy images, a standard axial T2 weighted FSE sequence was performed. The MRE images were acquired in the axial plane using a novel fast field echo sequence named eXpresso. The wave images were acquired on a matrix with 2 mm isotropic voxel size. Eight vibration phases were encoded at a mechanical excitation of 70 Hz.
Results: The peak amplitude of the mechanical wave was 130μm with a mean of 25μm in the prostate. No patient discomfort was reported when specifically asked. In the axial plane, the prostate gland is outlined in the T2W (a), and the reconstructed shear modulus G′ (b) and loss modulus G″ (c). The histology is shown in (d) where the outline of the large (Gleason score of 4+3) and smaller (3+3) tumors are shown. A very promising correspondence between reconstructed shear and loss moduli G′ and G″ and the matching histology slide can be observed. The mean values of G′ were 3.0, 1.6, and 0.8 kPa for Gleason scores of 4+3, 3+3, and healthy tissue, respectively. Also, the mean values for G″ were 1.7, 0.8, and 0.4 kPa for the same regions of interest.
Conclusions: This is, to the best of our knowledge, the first in-vivo prostate cancer patient MRE images that are correlated with whole mount histology. These early results confirm that cancerous tissue in prostate specimens has higher stiffness and also higher viscosity compared to healthy tissue. MRE is a promising tool in order to improve diagnosis and staging of prostate cancer tumors.

UP-030

Changes in Positive Surgical Margins over Time Reflect a Risk Migration in Patients Undergoing Radical Prostatecomy at a Tertiary Care Centre

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Introduction and Objectives: Positive surgical margin (PSM) rates after radical prostatectomy (RP) have been shown to be as low as 4% and as high as 48% in high volume centres. The incidence of PSM varies by pathological stage but can also be influenced by surgical techniques and by pathologist interpretation. PSM are predictive of biochemical recurrence but a significant proportion will not recur. In this study we sought to determine changes in incidence of PSM rates over time as lower risk patients opt for active surveillance and whether this was related to a shift in pathological stage and grade.
Methods: PSM, clinical and pathological staging, as well as PSA recurrence in almost 2,000 patients who underwent RP from 1993 to present was extracted from a prospectively recorded prostate cancer database at Vancouver General Hospital, BC, Canada. Patients were grouped by their date of surgery into either remote (1993-2004) or recent (2005-2011) cohorts. All pathological pT2 and greater patients were included. Regression models were developed to predict the rate PSM with adjustment for known confounders.

Results: Remote (765) and recent (1,216) radical prostatectomies were compared. The PSM rate was 21.7% from the remote cohort and 27% from the recent cohort (p=0.027). The postoperative Gleason grades shifted significantly from 45.97% Gleason 6, 43.83% Gleason 7, and 10.20% Gleason greater than 8 in the remote cases to 17.4%, 67.46% and 15.30% respectively in the recent cases ($p \leq 0.0005$). The percentage of patients with clinically high-risk disease was also significantly greater in the recent cohort ($p \leq 0.0005$).
Conclusions: The PSM rates in our tertiary care high volume centre are similar to other reported centres. The increase in PSM rates is likely due to a shift in patient population from lower risk patients to higher risk patients as lower risk patients opt for active surveillance.

UP-031

Holmium Laser Ablation of the Prostate Gland (HoLAP) Followed by Brachytherapy (BT) for Treatment of Patients with Clinically Localized Prostate Carcinoma (PC) and Obstructive Urinary Symptoms (LUTS)

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Introduction and Objectives: Patients with localized prostate carcinoma and LUTS who undergo BT with permanent seed implants have a 40 to 50% chance of going into urinary retention or requiring a catheter for intermittent self-catheterization (ISC) due to worsening of their obstructive urinary symptoms. The purpose of this study was to assess the role of HoLAP prior to BT in preventing post BT urinary complications.
Methods: 86 patients age 50-83 (mean 67.6) years with LUTS and clinically localized prostate carcinoma underwent HoLAP with a 100W holmium laser under spinal anesthesia. The end point of the procedure involved complete vaporization of obstructing prostate tissue down to the capsular fibers and appearance of an open prostate cavity. Patients underwent BT 7-45 (mean 16) weeks after HoLAP when they had recovered from the procedure. BT was done by real-time interactive ultrasound-guided (Iodine-125 or Palladium-103) seed placement with peripheral loading under general anesthesia.
Results: HoLAP significantly reduced prostate volume an average 25cc (44%), reduced the mean AUA symptom score by 13 points (84%) and increased mean Q-max by 11cc/sec (121%) (Table 1). There was no clinically significant change in AUA symptom score or Q-max following BT with a follow-up of 0.43-6.91 (mean 3.65) years (Table 2). No patient experienced prolonged urinary retention after BT and none has required ISC. No patient developed stress incontinence after HoLAP and BT.
Conclusions: Patients with prostate carcinoma and LUTS who have undergone HoLAP to relieve their obstructive urinary symptoms prior to BT do not experience prolonged urinary retention, worsening of their LUTS or stress incontinence following real-time interactive ultrasound-guided radiation seed placement with peripheral loading. With elimination of obstructive urinary symptoms and an approximately 44% reduction in the prostate volume by HoLAP a larger pool of patients with prostate carcinoma can benefit from modern brachytherapy.

Table 1. UP-031. Clinical parameter changes following HoLAP

Variable	n	Pre-Hol	Post-Hol	Δ%	*p*
Prostate Vol.	86	57.23±24.22	32.19±13.01	-44	<0.001
AUA Score	86	15.93±4.60	2.57±1.27	-84	<0.001
Q-max	76	9.63±3.02	20.43±10.28	+121	<0.001
Na	86	138.72 ±2.02	137.95±2.27	-0.5	0.001
Hb	86	14.36±1.34	13.60±1.40	-5	<0.001

Δ% Change = (Post-Holap - Pre-Holap)/(Pre-Holap) * 100.

Table 2. UP-031.Clinical parameter changes after HoLAP and BT

	N	Post HoLAP	Post BT
AUA Score	86	2.57	1.71
Qmax (cc/sec)	71	20.71	19.68

Mean duration of follow-up after BT 3.65 yrs. BT: Brachytherapy.

UP-032

Identification of Thrombotic Risk for Men with Advanced Prostate Cancer: a Pilot Study Evaluating Hemostatic Status Using Thromboelastography

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Introduction and Objectives: Coagulopathy is the second most common cause of death from cancer, and thrombotic complications are amplified in prostate cancer with systemic therapy. We aim to help identify patients at higher risk for thrombotic events in patients with prostate cancer with well-defined hemostatic tests, novel in their application to patients with advanced prostate cancer.
Methods: We performed intensive haemostatic studies in 27 patients (age range 59-88 years) at various stages (non-metastatic, metastatic, castration resistant) as compared to an age-matched control group (biopsy negative, n=9). Thromboelastography (TEG) is a global haemeostatic test that quantifies a vesicoelastic trace that reflects the kinetics of clotting. The study included whole blood TEG and flow cytometry analysis of microprticles (MPs) in plasma using Annexin V- FITC and anti-tissue factor - PE.
Results: Analysis of the data revealed hypercoagulable state in all patients with advanced disease. The mean values for TEG parameters in the patients were: R: 6.01 vs. 9.8 minutes in the control group (p=0.009), alpha angle: 68.3 (controls 53.1 degrees), MA: 69.3 vs. 57.9 mm in controls (p=0.053), and CI: 3.32 vs. 0.7 in controls (p=0.05). Microparticle assays revealed significant elevation in the number of microparticles carrying tissue factor in these patient groups compared to the control group [5,142 MPs/uL compared to 2,914 MPs/ uL (p=0.05)], suggesting a link between elevated tissue factor and the hypercoagulability.
Conclusions: To our knowledge, this is the first report for the use of TEG in patients with advanced prostate cancer. These results would suggest the rationale for a larger cohort study to determine the utility of these simple tools for evaluation of patients' thrombotic potential and may help identification of those who require anticoagulant prophylaxis towards the end of their cancer journey.

UP-033

Predictors of Failing Active Surveillance on the 2nd Prostatic Biopsy

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Introduction and Objectives: Active surveillance (AS) is a popular method to minimize the morbidity associated with overtreatment of prostate cancer. The rate of patients who progress by grade/volume is reported as 9-35%(1). We examine factors from the 2nd biopsy, whilst on AS, that may predict pathological progression and need for subsequent therapy.
Methods: We identified patients from our prospectively maintained, single academic institution, database with PSA <20, Gleason sum (GS) ≤6, stage T1c, ≤3 cores positive for cancer, <50% of single core involved, age ≤75y years and had a repeat biopsy within 48 months after the initial biopsy (n=312). Logistical regression was performed on available data (n=278) to identify predictors of pathological progression, which was defined as GS ≥7, >3 positive cores and >50% tumor involvement of any single core.
Results: Of the 278 patients included, 48 patients had pathological pro-

gression on 2nd biopsy and 264 did not. For both groups, median number of biopsy cores taken at 2nd biopsy was the same (n=15). Predictors of pathological progression found were PSA velocity (for every 1 unit increase, OR 1.12 (1.03-1.21), p=0.01), total number of cores taken at first biopsy <10 (OR 2.78 (1.2-6.67), p=0.02), and time between 1st and 2nd biopsies (for every 1 month increase, OR 1.05 (1.02-1.08), p=0.002).
Conclusions: We have identified predictors of progression for patients on AS. Patients who had <10 cores on initial biopsy should have confirmatory biopsy to avoid under-sampling. Delay in 2nd biopsy should be avoided and rapid PSAV should trigger early re-biopsy.

UP-034

Prostate Cancer Detection after Multiple Negative Biopsies

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Introduction and Objectives: The rates of false negative prostate biopsies range between 10-20%. There is limited evidence describing the prognosis of prostate cancers (PCa) diagnosed after previous negative biopsies. We evaluate the indicators for multiple repeat biopsies, predictive factors of tumors that are eventually diagnosed, and clinical parameters that differentiate patients that are later diagnosed with clinically significant disease from low risk cancers after initial negative biopsy.
Methods: A retrospective search was performed over 20 years of patients with a new diagnosis of PCa and at least two prior negative prostatic biopsies. Predictive clinical and pathologic data were examined prior to eventual positive biopsy and associated with grade and management decisions/outcomes.
Results: A total of 70 patients with 2 to 7 prior negative prostatic biopsies were included. 20 patients had a Gleason Score (GS) ≥8, 30 GS 7, 20 were GS <7. A persistently elevated or rising PSA and suspicious pathology on prior biopsy were the two main indications for repeat biopsies. Prior atypical acinar small proliferation (ASAP) and/or high-grade prostatic intraepithelial neoplasia (HGPIN) were significant risk factors for later PCa diagnosis. DRE, PSA and PSA velocity were not significant in cancer diagnosis. 67% of patients underwent radical prostatectomy, 23% on active surveillance, 4% had radiation and 3 % systemic hormonal therapy. The number of previous biopsies did not predict for either tumor volume of GS at diagnosis.
Conclusions: Persistently rising PSA as well as ASAP and HGPIN predict for future positive diagnosis of PCa. A high number of intermediate and high-risk prostate cancers were diagnosed in those with prior negative prostate biopsies. Most importantly, the number of prostate biopsies did not predict for smaller low-grade cancers and point to the importance of vigilance in patients suspected of having prostate cancer with a persistently rising PSA.

UP-035

Intermediate Clinical Outcomes of Robot-assisted Laparoscopic Prostatectomy (RALP)

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Introduction and Objectives: We review our experience of RALP with a minimum follow-up duration of 24 months. The hospital records of consecutive patients who underwent transperitoneal RALP by a single surgeon (CW) were reviewed.
Methods: A bladder neck sparing dissection was preferentially performed and the urethrovesical anastomosis was completed using a running double-armed 3-0 Monocryl suture. On postoperative day 5 or 6 (clinic logistics), the urethral catheter was removed following a normal cystography.
Results: Clinical outcomes and adverse events are presented. 233 patients had a mean age of 62.7±6.7 years and serum PSA of 6.2±4.6 ng/mL. Median operative time was 190 minutes and estimated blood loss was 75 mL. 3 (1.3%) patients required bladder neck reconstruction, while 198 (85.0%) had bilateral, 20 (8.6%) had unilateral and 15 (6.4%) did not undergo nerve sparing prostatectomy. 199 (85.4%) patients had negative surgical margins. Median hospitalization and urethral catheter duration were 1.0 and 5.0 days, respectively. At 6 weeks, a median 1.0 pad per day usage was reported. 69.1% of patients achieved urinary continence without pads at the 3 month follow-up interval and 95.7% of patients were continent at 12 months. 52.3% of patients having a nerve sparing procedure achieved potency within 24 months following RALP. The incidence of adverse events were low: 5 (2.1%) patients had prolonged urine leak, 3 (1.3%) patients experienced a pelvic hematoma, 1one (0.4%) patient had a urinary tract infection, and 2 (0.9%) and 5 (2.1%) patients developed deep vein thrombosis and bladder neck contractures (BNC), respectively. 95.3% and 96.5% of patients at 12 and 24 months, respectively, had an undetectable serum PSA (<0.2 ng/mL). Five patients had adjuvant radiotherapy for positive surgical margins or PSA recurrence.
Conclusions: RALP is an effective treatment option for clinically localized prostate cancer that preserves ones quality of life with low patient morbidity.

UP-036

Factors Influencing Choice of Robotic-assisted vs. Open Radical Prostatectomy for Prostate Cancer Treatment

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Introduction and Objectives: Despite its debated benefits, much of the rapid adoption of robotic-assisted laparoscopic prostatectomy (RALP) in USA has been attributed to aggressive advertising, market demand, and hospital utilization pressures. In our study, we aim to examine RALP vs. radical retropubic prostatectomy (RRP) utilization rates in a large health maintenance organization where marketing and financial incentives are minimized.
Methods: Patients were grouped to either RRP or RALP from a prospectively collected prostate cancer database at Kaiser Permanente Southern California (KPSC). Demographics, clinicopathologic data, and surgeon profiles were recorded. Descriptive statistics and chi-squared analysis were used.
Results: From March to October 2011, 500 patients undergoing RRP vs. RALP were identified. The majority, 455 (91%) patients underwent RALP and 43 (9%) underwent RRP, with a median age of 60 (37-77) and 62 (39-70), respectively. There were a total of 21 RALP surgeons and 17 RRP surgeons, with 2 surgeons in both groups. The mean age of RALP surgeon was 40 years while the mean age of RRP surgeon was 49 years (p=0.0007). Overall, 13 (76%) RRP surgeons were out of training >10 years compared to 3 (14%) of RALP surgeons. The majority of patients was clinical stage T1c (71% for RALP group and 84% for RRP group) and had a biopsy Gleason score of 6 (53% for RALP group and 60% for RRP group). There was no statistically significant difference in patient age (p=0.5), race (p=0.61), clinical stage (p=0.78), biopsy Gleason score (p=0.91) or final pathologic stage (p=0.32) between the two groups.
Conclusions: Within our health maintenance organization, RALP remains the most common modality of surgery for prostate cancer. The surgeon's age and years out of training may influence the decision to perform RRP, rather than preoperative patient clinical characteristics.

UP-037

What Is the Prevalence and Impact of Depression, Anxiety, and Distress in Patients with Newly Diagnosed Localized Prostate Cancer?

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Introduction and Objectives: Mental health concerns and their impact on recovery often go unnoticed in men with prostate cancer. The study objective was to determine the prevalence of depression, anxiety and distress over time among active surveillance and surgical patients and to investigate the affect these mental health measures may have on urinary and sexual quality of life over time.
Methods: The study population consisted of patients who were managed

with active surveillance (AS) or radical prostatectomy (RP). Baseline levels of depression, anxiety and distress were ascertained using well-validated questionnaires: Patient Health Questionnaire 9(PHQ-9), Generalized Anxiety Disorder 7 (GAD-7) and the Distress Thermometer (DT), respectively. Multivariate logistic regression examined associations between clinical factors and mental health while mixed model repeated measures analysis examined the affect of baseline depression, anxiety and distress on sexual and urinary quality of life in follow-up.
Results: Among the 907 men that made up the study cohort moderate or higher levels of depression or anxiety appeared low (<5%) while levels of mild depression or anxiety ranged from 7-15%. Levels of high distress ranged from 6-18%. There appeared to be no difference between active surveillance and surgery patients except at 1-3 years, where active surveillance patients showed more anxiety. Worse urinary and sexual function, decreased age and not being in a relationship were associated with worse mental health. Increased levels of depression, anxiety or distress at baseline were associated with worse urinary and sexual function and bother in follow-up.
Conclusions: Levels of moderate or higher depression, anxiety and distress may appear low at baseline and follow-up, however, worsening mental health at baseline was associated with worse urinary and sexual outcomes over time.

UP-038

Autologous Retropubic Urethral Sling: a Novel, Quick, Intraoperative Technique for Improving Continence after Robot-assisted Laparoscopic Prostatectomy

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Introduction and Objectives: We describe a novel technique using the medial umbilical ligament or vas deferens as an autologous retropubic urethral sling placed at the time of robotic assisted laparoscopic prostatectomy (RALP) and evaluate its impact on postoperative continence.
Methods: In 2011, men who underwent sling placement were compared to men who did not have a sling placed. Slings were placed primarily in men who were expected to have worse recovery of urinary continence. Sling placement involved harvesting a segment of the medial umbilical ligament or vas deferens, placing it under the vesico-urethral anastomosis, affixing it to the pubic symphysis, and adjusting the tension to create a slight elevation of the vesicourethral angle. The association of sling placement on time to one and no pads per day (PPD) was assessed using Cox proportional hazards regression analysis.
Results: The study cohort consisted of 54 men who underwent sling placement and 41 men who did not during the same time period. Median follow-up was 4.8 months in the sling patients and 5.5 months in the non-sling patients. Clinical and pathological characteristics were similar between the groups, with the exception of sling patients displaying more high-grade disease and less nerve sparing ($p<0.01$). There was no significant association seen between placement of a sling and time to 1 PPD on either univariate or multivariate analysis. There was trend towards a benefit of sling placement in time to 0 PPD on univariate analysis ($p=0.08$), but this failed to reach statistical significance and was attenuated after adjustment for demographic and clinical covariates.
Conclusions: Although the association between sling placement and early continence did not reach statistical significance, there was a trend towards a benefit in sling patients in time to no PPD. Randomized trials are needed to assess the true benefit of sling placement on continence outcomes.

UP-039

Predictors of Gleason 8 Cancer among Men with Gleason 7 and 8 Cancer on Prostate Biopsy Cores

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Introduction and Objectives: The purpose of this study was to determine the incidence of intermediate and high-risk disease among men with discordant prostate biopsy grades.
Methods: Consecutive patients with at least one prostate biopsy core of Gleason 8-10 cancer AND at least one prostate biopsy core of Gleason <8 cancer treated with radical prostatectomy (RP) at The Ottawa Hospital between 1995 and 2010 were reviewed. Candidate predictors were the proportion of Gleason 3 cancer from all biopsy tissue, the proportion of biopsy cores that contain Gleason 3 cancer, the number of cores that contained Gleason 3 cancer and the highest proportion of Gleason 3 cancer on any core. The primary outcome was final prostate cancer Gleason score from the RP specimen.
Results: Of 750 radical prostatectomies, 22 (3%) met inclusion criteria. Of these, 11 (50%) had a final Gleason sum of 7 or less, while 11 (50%) had a final Gleason 8 or more. Of the 7 men with at least one core Gleason 9, only 1 (14%) had a final Gleason sum less than 8. The proportion of biopsy tissue that was Gleason 3 was 5.0% (SD 4.9%) versus 6.3% (SD 8.4%) for patients with RP Gleason score of less than 8 compared to 8 or more ($p=0.97$). The respective, mean proportion of cores that had Gleason 3 was 31.4% (SD 21.8%) compared to 35.1% (SD 31.3%) and the median number of cores that had Gleason 3 was 3 (IQR 2-4) compared to 2 (IQR 1-4). On average the highest proportion of Gleason 3 in any core also did not predict RP Gleason grade with 26.4% (SD 23.9%) compared to 24.6% (SD 16.2%)($p=0.95$).
Conclusions: When a patient has a biopsy core of 8 or more and a discordant biopsy core of less than 8, he has a 50% risk of an RP Gleason score of 8 or more. When one core is Gleason 9 or more, almost all patients have Gleason 8 or more in the RP specimen. The proportion of Gleason 3 cancer in the biopsy specimens was not predictive of RP Gleason grade. Further study to verify our findings using larger samples is warranted.

UP-040

Comparison of Serum Testosterone Levels in Prostate Cancer Patients Receiving LHRH Agonist Therapy with or without the Removal of the Prostate

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Introduction and Objectives: The prostate is an endocrine organ whose primary function is secreting enzymes and nutrients promoting sperm motility. Recent reports suggest that the prostate may also secrete testosterone, believed to be a fuel for prostate tumor growth. The aim of this study was to determine if a difference in serum testosterone levels exists between men on LHRH agonists who have undergone radical prostatectomy, radiation or hormone therapy as primary prostate cancer treatment.
Methods: Serum testosterone levels were evaluated among 165 consecutive PCa patients using LHRH analogues for >3 months. We excluded patients receiving either radiation or chemotherapy at time of time of testosterone measurement. Patients were classified based on primary treatment: 1) radical prostatectomy (RP); 2) radiation (Rx) or 3) primary hormone therapy (PH). One-way ANNOVA was used to compare testosterone levels. Pearson correlation was used to correlate testosterone with PSA and time on LHRH agonists. Multivariable linear regression was used to predict serum testosterone levels.
Results: The median (IQR) serum testosterone levels were 1.4 (1-1.9), 1.3 (1-1.625) and 1.25 (0.9-1.525) nmol/L for RP, Rx and PH groups respectively. There was no statistically significant difference in testosterone levels between the groups ($p=0.3$). No correlation was found between testosterone and PSA levels or time on LHRH (R=0.02 and R=0.01) respectively.

Multivariable linear regression showed that none of the clinical variables were predictors of testosterone levels.
Conclusions: Our study suggests that primary treatment does not affect serum testosterone levels among men using LHRH analogues. Preliminary data also suggests that surgical removal of the prostate may not confer an added advantage in reducing testosterone levels.

UP-041

A Prospective Phase II Trial of Stereotaxic Hypofractionated Cyberknife (CK) Treatment for Locally Recurrent Prostate Adenocarcinoma Following External Beam Radiotherapy (EBRT)

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Introduction and Objectives: EBRT is frequently used as primary treatment for prostate cancer. Although EBRT can achieve a really good biochemical control at long term, some residual tumor can subsist. Those focci could further de-differentiate, disseminate and cause metastatic disease. Patients presenting a locally recurrent prostate cancer post-EBRT are usually put on a palliative treatment. Curative treatment such as cryotherapy, prostatectomy, brachytherapy and Hi-FU can be considered. However, there is considerable concern with their potential sides effects. Retrospectives studies of post-EBRT hypofractionated treatments with CK have shown promising results. Consequently, we propose to study the feasibility of reirradiation in patients presenting a biochemical relapse post-EBRT and design a Phase I-II trials to evaluate the genitourinary toxicities as well as the local control (LC) and the overall survival (OS).
Methods: We record the doses given for prostate reirradiation in the literature. Prostate MRI perfusion were performed to access the ability to detect locally recurrent prostate carcinoma after previous EBRT. With the selected fractionations, we perform a preliminary study. Simulations on a computerized treatment planning system were done to evaluate the feasibility of the treatment. A Phase I-II protocol was then written on the basis of those findings.
Results: A CK treatment of 25, 30 and 35Gy is achievable in 5, 6 and 7 fractions respectively without overpassing organ at risk dose restrictions. Our feasibility study shows that prostate MRI perfusion is a good tool in identifying prostatic relapse focci.
Conclusions: Locally relapsing focci can be identified with a MRI perfusion in patient presenting a recurrent prostate cancer post-EBRT. A CK hypofractionated treatment can potentially be curative. A Phase I-II trial is currently recruiting and will evaluate the associated toxicities as well as the OS and the LC. The results of the first cohort of patients will be presented at the meeting

UP-042

Involvement of TBK1 in Prostate Cancer Progression through IKKε Cellular Localization Control

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Introduction and Objectives: Overexpression of inflammatory cytokines IL-6 and IL-8 has been associated with hormono-sensitive (HS) prostate cancer (PCa) progression to a castrate-resistant status (CR). In HS cells, cytoplasmic expression of the kinase IKKepsilon (IKKε) is inducible in response to infections. Conversely, in CR cells, IKKε is constitutively expressed in the cytoplasm and the nucleus. To study IKKε cellular regulation in PCa, we have focused on its cytoplasmic partner, TANK-binding kinase 1 (TBK1). Recent studies have shown the requirement of TBK1 in oncogenesis but its function in PCa remains unclear. We hypothesize that TBK1 acts to sequester IKKε to the cytoplasm. However, IKKε overexpression disturbs the stoichiometric balance in CR cell lines, thus permitting its nuclear translocation and IL-6/IL-8 secretion.
Methods: To elucidate these molecular events during PCa progression, we have designed inducible lentiviral constructs that allow us to control TBK1 or IKKε expression. We generated HS and CR clones, in which TBK1 expression can be knocked-down using inducible shRNA. We also selected constructs that enable overexpression of TBK1 in CR cells. The cellular localization of IKKε is monitored by Western blot analysis and its nuclear activity by cytokine secretion quantified by ELISA.
Results: The investigation of TBK1 knock-down in CR clones did not reveal an increase of IKKε in the nucleus. To confirm this, we are overexpressing TBK1 in CR cells to maintain IKKε in the cytoplasm. We are also evaluating the consequence of TBK1 knock-down in HS clones when IKKε expression is induced. Knowing that in this model IKKε remains within the cytoplasm, we expect to observe IKKε nuclear accumulation.
Conclusions: Loss of TBK1 in CR cell lines does not support our hypothesis, although in these cells this may be due to initial saturation of IKKε. Further experiments are ongoing to more fully elucidate a possible relationship between TBK1, IKKε and its nuclear translocation.

UP-043

The Association between Aspirin and Non-steroidal Anti-inflammatory Drug Use and the Risk of Prostate Cancer Detection upon Biopsy

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Introduction and Objectives: Chronic inflammation plays an important role in carcinogenesis. Interest has been generated in determining if COX-inhibitors reduce prostate cancer (PCa) risk. Our objective was to study the association between aspirin (ASA) and other non-steroidal anti-inflammatory drugs (NSAIDs) and PCa detection using a cohort undergoing prostate biopsy.
Methods: Using a prospectively maintained database of patients undergoing prostate biopsy, ASA and other NSAID use, biopsy results, and other clinical variables were ascertained by questionnaire and chart review. Hypothesis tests were conducted using the Chi-Square and Kruskal Wallis tests for categorical and continuous variables, respectively. Univariable and multivariable analyses were performed to explore the associations between exposure to ASA and other NSAIDS and PCa outcomes.
Results: Of the 931 patients in our cohort, prostate biopsy diagnosed PCa at a significantly higher rate among patients taking ASA (65%, $p<0.001$) and those taking other NSAIDs (65%, $p<0.001$) compared to those taking no NSAIDs (42%). Patients taking ASA (38%, $p<0.001$), but not those taking other NSAIDs (21%, p=NS), were more likely to be diagnosed with HGPCa compared to those not taking NSAIDs (21%). On multivariate analysis, ASA use (OR=2.16, $p=0.0002$) and other NSAID use (OR=3.00, $p=0.0004$) were associated with higher odds of PCa detection, while ASA use was associated with a higher odds of HGPCa detection (OR=1.64, $p=0.038$).
Conclusions: In contrast to the majority of epidemiological studies in the literature, ASA and other NSAID use in our cohort were associated with a higher risk of detecting PCa, while ASA use was associated with a higher risk of detecting HGPCa. These medications may still have chemopreventative properties, such that patients whose cancers were prevented were never referred for biopsy. However, studies are needed to further assess the impact of our findings on PCa screening risk assessment.

UP-044–WITHDRAWN

UP-045–WITHDRAWN

UP-046

Active Surveillance for Prostate Cancer in Patients with a PSA >10

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Introduction and Objectives: The use of prostate specific antigen (PSA) in active surveillance (AS) for prostate cancer is controversial. Several published series use an entry PSA >10 ng/mL as an exclusion from AS[1-3]. Since we do not use an elevated PSA as an absolute contraindication to start or continue AS, we set to review our experience as to the significance of a PSA value over 10 ng/ml in patients on AS.

Methods: Our cohort included all patients on AS with clinical stage T1c–T2a, Gleason score ≤6, and three or fewer cores positive with no more than 50% of a core involved at initial diagnostic biopsy. Patients with less than two biopsies were excluded. Patients were grouped into those who 1) started AS with a PSA >10 ng/mL, 2) had a PSA rise >10 ng/mL during follow-up and 3) had a PSA <10 ng/mL throughout AS. Pathologic progression (PP) was defined as biopsy parameters exceeding the entry criteria limits.

Results: There were 340 patients in our cohort according to the biopsy entry criteria with at least 2 biopsies on AS. The whole cohort had a mean age of 64.3 years and a median follow-up of 45.6 months. Initial biopsy characteristics did not differ between groups. Median PSA (ng/mL) at initial biopsy was 12.3, 6.8 and 4.5 for groups 1-3, respectively (p<0.001). Median prostate volume (mL) was 61, 51 and 42 for groups 1-3 respectively (p<0.001). Outcomes by group are in Table 1. PP at first biopsy was not different between groups (p=0.44), nor was the proportion who had treatment (p=0.36). Using logistic regression analysis, PSA density was not predictive of PP at 1st repeat biopsy, even after adjusting for group.

Conclusions: With careful patient selection, those with a PSA >10 do not necessarily need to be excluded from active surveillance. In our cohort those starting AS with a PSA >10 ng/mL did not have a higher rate of pathologic progression at first repeat biopsy compared to those following stricter criteria.

UP-047

Targeting the Proprotein Convertases in Prostate Cancer

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Introduction and Objectives: Our studies provide increasing evidence for the role of the proprotein convertases (PCs) in prostate cancer. The PCs are proteolytic enzymes involved in precursor activation of many cancer-associated proteins. Our focus has been on one PC in prostate cancer, namely PACE4. Our data validates PACE4 as a potential therapeutic target and aims to understand its mechanisms in prostate cancer progression, while testing its molecular and pharmacologic silencing in cellular and animal models.

Methods: We examined PACE4 expression in prostate cancer tissues obtained from radical prostatectomies. We also studied three classic prostate cancer model cell lines, namely DU145, LNCaP and PC3 cells for PC expression and effects of downregulation via molecular silencing using lentivirus delivered shRNAs. We developed and tested PACE4 inhibitors (and analogs) as potential therapeutic leads. In vivo biodistribution kinetics were measured in tumor-bearing Balb/c nude mice by μPET imaging.

Results: Our results demonstrate that PACE4 is over-expressed in 100% of the prostate cancers tissues tested to date, while levels correlate with Gleason scores. Molecular PACE4 silencing in cancer cells lines, results in highly reduced proliferation in vitro, but also when these modified cell lines are implanted in immuno-deficient mice. Pharmacologic PACE4 inhibitors reduced growth rates of prostate cancer cell lines when tested in xenograft mouse models. A PACE4 imaging probe detects PACE4 cancer cells lines implanted in immuno-deficient mice.

Conclusions: Our data shows that PACE4 is a key enzyme in prostate cancer. PACE4 is most likely activating key growth factors, and the lack of active growth factors can severely limit further proliferation. Further studies will focus on the feasibility of this approach as well as the limits in regards to potential cell resistance. The identification of these PC-related growth factors is currently being examined.

UP-048

Histopathological Features Following Prostate High Intensity Focus Ultrasound Salvage Therapy for Radiation-failure

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Introduction and Objectives: The interpretation of needle biopsy specimens from prostates following radiotherapy is often challenging. In locally radio-recurrent prostate cancer, high intensity focused ultrasound (HIFU) is a promising salvage treatment option. Biopsy specimens post-HIFU are even more challenging to interpret. Herein, we document the histologic features following whole-gland salvage HIFU.

Methods: From 2006 to 2010, 55pts, with biopsy-proven localized radio-recurrent prostate cancer (PCa) were subjected to whole- gland salvage HIFU.TRUS-guided prostatic biopsies were routinely performed at 6 mos.

Table 1. UP-046

		Baseline PSA >10 (n=44)	PSA rise >10 (n=80)	PSA ≤10 (n=216)	*p*-value
Median follow-up months (IQR)		33.9 (18.3-63.4)	54.7 (36.3-73.7)	43.5 (22.8-62.9)	0.03
Median days to 1st repeat biopsy (IQR)		365 (170-663)	510 (266-817)	382 (198-623)	0.08
PP at 1st repeated biopsy(%)		14 (31.8)	28 (35.0)	60 (27.8)	0.44
Reason for PP at 1st repeat biopsy	Number of cores involved (%)	6 (13.6)	15 (18.6)	38(17.6)	0.76
	Gleason score (%)	11 (25.0)	21 (26.3)	36(16.7)	0.13
	% core involvement (%)	3 (6.8)	7 (8.8)	15 (6.9)	0.86
Number who underwent treatment (%)		20 (45.5)	30 (37.5)	74 (34.3)	0.36
PP at subsequent biopsy (%)		1(2)	4(5)	9(4)	0.19
Number started on 5-alpha reductase inhibitor (%)		8 (18.2)	27 (33.8)	48 (22.2)	0.007

IQR: interquartile range; PSA: prostate-specific antigen; PP: pathologic progression.

Table 1. UP-048

Parameters	Pre HIFU Biopsies (N=55)	Post HIFU Biopsies (N=14)
Age yr	69(57-79)	71(67-74)
PSA ng/ml	3.61(0.10-15.8)	4.25(2.61-6.08)
Gleason Score (n%)		
≤6	16(29)	
7	28(51)	8(57)
≥8	11(20)	2(14)
N/D		4(29)
Localization n(%)		
Base	24(44)	3(21)
Mid	8(14)	
Apex	1(2)	4(29)
Mid+Apex	2(4)	2(14)
Mid+Apex+Base	12(22)	
Mid+Base	8(14)	5(36)

Note: Median (range). HIFU: high intensity focused ultrasound; PSA: prostate-specific antigen.

post treatment. This study included the retrospective histopathological review, by one expert Uro-pathologist, of all prostatic biopsy performed. Immunohistochemical stains and high molecular weight cytokeratin were performed.
Results: Median follow-up was 25 months (5-56). Of 55 pts, 49(89%) underwent a standardized follow-up biopsy. Median pre-salvage PSA was 3.61ng/ml and post-salvage nadir was 0.19ng/ml. Biopsy was positive in 14 cases. Clinical characteristics listed in Table 1. In all cases, benign prostate ducts and acini showed variable degrees of atrophy. Treatment related changes included marked reactive atypia (93%) edema, fibrosis and cystic changes (71%) and coagulative necrosis (86%). Concordance of Gleason grading was observed between the pre- and post-therapy specimens in 60% cases, upgraded (+1 Gleason score) in 30% pts and downgraded (-3 Gleason score) in 10%. Extent of disease in those with persistent cancer showed significantly lower cancer extent, with many having focal or limited uni-lobar involvement. HPIN was still seen in 8 (57%) biopsies post-HIFU.
Conclusions: The histopathological analyses of prostate biopsies following whole-gland salvage HIFU require an expert Uro-pathologist for accurate interpretation and diagnosis, which is an integral part of the management of patient with radio-recurrent prostate cancer.

UP-049

Insight into Dietary Prevention of Prostate Cancer: Effects of Fish Oil and Krill Oil on Inflammation

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Introduction and Objectives: Inflammation is a major risk factor for prostate cancer (PCa). Our previous data showed that, between patients, prostatic inflammation is highly variable and that a high level is associated with aggressive PCa. Here, we aimed to compare incorporation of fish oil (FO) and krill oil (KO) into prostatic epithelial cells and their impact on inflammation level.
Methods: Primary prostatic epithelial cells were derived from a radical prostatectomy specimen for Gleason 7 organ-confined PCa. Biopsies were taken from the normal prostatic zones and were cultured in selective medium (KSFM) to isolate prostatic epithelial cells. At 90% confluence, FO or KO or control buffer was added to the medium for 24 hours. Prostatic inflammation level was characterized by measuring secreted IL-8 in the medium and was normalized to the number of cells based on total DNA. After trypsinization of prostatic cells, 4-cycle washing with HBSS and lipid extraction of cell membranes, fatty acid profiles were obtained by gas chromatography. All experiences were triplicated.
Results: FO and KO increased the levels of omega-3 (13-fold, $p<0.0001$; 12-fold, $p=0.003$) but only slightly of omega-6 (1,5- and 1,2-fold ; both $p>0.08$) fatty acids in cultured prostatic cells. Fatty acids from KO (phospholipids) were incorporated faster into cell membrane than fatty acids from FO (triglycerides). However, the addition of FO or KO increased the levels of inflammation in cells from this patient with a low prostatic inflammation level.
Conclusions: Integration into prostate cell membrane of fatty acids from KO is faster than from FO, because of their molecular type. In this patient with low inflammation level, both oils increased the inflammation level, likely because of the omega-6 content of both oils. Further work to decipher how omega-3 and -6 fatty acids affect prostate inflammation is needed. Prevention of PCa by dietary supplements of FO or KO may not be adapted to every patient.

UP-050

Inconsistent Testosterone Monitoring and Antiandrogen Use in Prostate Cancer Patients Receiving Androgen Deprivation Therapy

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Introduction and Objectives: The goal of androgen deprivation therapy is the suppression of testosterone (T) to castrate levels. Despite this goal, routine monitoring of T and antiandrogen (AA) use to prevent T surge and clinical flare in patients receiving gonadrotropin-releasing hormones (GnRH) agonists appears to be inconsistent. A series of discussions involving surveys using an audience response system that ensures anonymity was held in order to identify and quantify gaps in clinical practice.
Methods: From May 3 to November 24, 2011, 15 discussion groups sponsored by Ferring Inc. were held across Canada. Mostly urologists and some radiation oncologists (n=133, range 6-11 per discussion group) were surveyed pre- and post-discussion on the role of T monitoring and the impact of inadequate T suppression on disease progression and survival as reported in the literature. Questions included definition of castrate levels, frequency of T monitoring and AA use for flare protection.
Results: Ranges are between discussion groups. Pre-discussion, 53% (range 0-91%) indicated 0.5 ng/mL (1.7 nmol/L) was an adequate castrate level; post-discussion, 91% (75-100%) chose either 0.32 or 0.2 ng/mL. Pre-discussion, 24% (0-83%) indicated they measured T at baseline, periodically and with rising PSA; post-discussion, 60% (12-100%) would do so. Pre-discussion, 51% (10-100%) indicated they always use AA for flare protection.
Conclusions: Frequency of testosterone monitoring, interpretation of castrate levels and antiandrogen use in prostate cancer patients receiving androgen deprivation therapy varies widely between physicians and across Canada. These data indicate a need to provide better education and guidance on timing, interpretation and management of testosterone measurements.

UP-051

Single Nucleotide Polymorphisms (SNPs) Associated with Late Radiation Toxicity after Prostate Brachytherapy

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Introduction and Objectives: Excessive toxicity from prostate brachytherapy treatment may be related to increased radiosensitivity from genetic polymorphisms. We aimed to identify single nucleotide polymorphisms (SNPs) that were associated with high toxicity after therapy to determine possible markers for increased radiation sensitivity.
Methods: 349 patients treated with prostate brachytherapy at the Cross Cancer Institute between 1998 - 2010 provided saliva samples from which DNA was extracted for this research ethics board approved study. In the cohort of patients with at least 2 years of follow-up, 41 patients were identified as having high late toxicity (≥RTOG grade 2 GI or GU toxicity).

71 patients were identified as controls with minimal toxicity (persistent IPSS increase <6, EPIC quality of life score >79). We analyzed 15 potential SNPs from 13 genes (MSH6, GSTA1, SOD2, NOS3, GSTP1, ATM, LIG4, XRCC1, XRCC3, RAD51, TP53, TGFB1, ERCC2) for correlation with increased late toxicity. Patient factors and dosimetric parameters were also collected and included in the analysis.
Results: All 15 proposed SNPs demonstrated polymorphism. We implemented a univariate analysis to examine the correlation between variant allele SNPs and increased toxicity. This revealed a statistically significant relationship in 5 of the SNPs. Variants in SNPs rs1695 (GSTP1), rs1800470 (TGFB1), rs1801320 (RAD51), rs1805386 (LIG4), and rs4880 (SOD2) were correlated with increased late toxicity (all $p<0.1$). Diabetes, coronary disease, hormone therapy, age at implantation and parameters such as the prostate V150, V100, and D90 were also all significant for an association with late toxicity ($p<0.1$).
Conclusions: Our study demonstrates 5 SNPs in GSTP1, TGFB1, RAD51, LIG4 and SOD2 which are statistically significant for association with late toxicity, which may be utilized in future studies to identify patients at risk for complications after brachytherapy.

UP-052

Prostate Cancer Antigen 3 Density Shows Similar Predictive Value of Positive Prostate Biopsy as Prostate Cancer Antigen 3 Alone

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Introduction and Objectives: Prostate Cancer Antigen (PCA3) is a novel biomarker currently used for improved prediction of prostate cancer on prostate biopsy. Multiple studies have indicated superior specificity of PCA3 when compared to PSA levels alone. Also, PCA3 has been shown to be directly related to tumor burden in prostate cancer, suggesting that higher PCA3 values relative to the volume of the prostate indicate greater tumor burden. This represents the concept of PCA3 denisty. Studies have demonstrated improved predictive ability of PCA3 density for prostate cancer on prostate biopsy. We evaluated this hypothesis in our patient population.
Methods: PSA levels, PCA3 levels and prostate volumes were collected from 1152 men who had prostate biopsy in a retrospectively organized database from a single organization. All men had PCA3 urine assay performed after a deliberate prostate exam immediately before undergoing trans-rectal ultrasound and prostate biopsy. Prostate volume was calculated using the length x width x height method during trans-rectal ultrasound. Receiver operating characteristic (ROC) curves were plotted and the area under the curve (AUC) was determined.
Results: 798 out of 1152 patients included in the study had a positive prostate biopsy. Logistic regression was used to generate area under the ROC curve for PCA3, PSA and PCA3 density. Our analysis showed the AUC for PSA , 0.5400, AUC for PCA 3, 0.6816 and AUC for PCA3 density, 0.6803. The difference in the AUC for PCA3 and PCA3 density was not statistically significant.
Conclusions: In this study, there was no statistical difference in prediction of positive prostate biopsy between PCA3 and PCA3 density.

UP-053

Use of Patient Educational Technologies (PET) by Patients Diagnosed with Prostate Cancer

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Introduction and Objectives: Patient education is a vital part of successful shared decision making. Conventional educational materials provide limited feedback as to their use. Information technology, however, offers opportunities for more interactive platforms and a richer understanding of their effectiveness. We set out to study how patients interact with Patient Educational Technology (PET) aimed at informing them about their treatment options for prostate cancer.
Methods: A PET library was developed for prostate cancer, with 15 modules falling into 3 categories: those related to diagnosis (4), treatment options (8), and treatment side effects (3). Data generated from patients' use of PET is tracked in detail and recorded in real time. The PET library was made available to the patient population of two urologists between 2008 and 2011.
Results: 394 patients newly diagnosed with prostate cancer were given access to the PET library. 123 (31%) with a mean age of 56.4 logged in and viewed at least one module (mean 3, range 1-12). On first visit patients most commonly viewed material on diagnosis, while subsequent visits focused on treatment. Specific information sought shifted from clinical and procedural to that of risk, side effects and decision making with later visits. The average time viewing material on first visit was 10 minutes versus 14 minutes for return visits ($p<0.025$). The average time over which patients viewed modules was 43 days.
Conclusions: When referred, a number of patients diagnosed with prostate cancer engage with PETs on an ongoing basis between the time of diagnosis and treatment. The information sought evolves in a logical manner. Understanding which patients engage with these types of technologies, and how, is an important step in developing more useful PETs; tools that hold the potential to provide an effective and inexpensive means to improve shared decision making on a broad scale.

UP-054

Comparison of Pathological Outcomes of Radical Prostatectomy in African Americans and Caucasians Who Are Potential Candidates for Active Surveillance

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Introduction and Objectives: While active surveillance is safe in appropriately selected patients, there is little data to show whether African Americans (AA), who may represent a higher risk population, have equivalent outcomes as other racial groups. We compared pathological outcomes of AA and Caucasians who underwent radical prostatectomy (RP) but who were candidates for active surveillance (AS).
Methods: A retrospective database review was conducted on patients that underwent RP between June, 1990 and March, 2011. Patients were considered potential candidates for AS if their biopsy Gleason scores were 6<= and clinical stage T2a or less. Intermediate risk patients were considered to have either stage T2b or Gleason score 3+4.
Results: A total of 1,444 (47.5%) were Caucasian, 1,416 (46.6%) AA and 177 (5.8%) other. A total of 1,139 (37.5%) were potential candidates for AS following biopsy, and 761 (25.1%) were intermediate risk. Caucasians more frequently met the criteria than AA (40.0% vs. 35.5%, $p=0.03$). At RP, Caucasians and AA demonstrated a similar rate of Gleason upgrading: 334/570 (58.6%) vs. 291/496 (58.7%), $p=0.981$. A primary Gleason grade 4 was observed in 20.3% and 28.9% of Caucasians and AA respectively, $p=0.890$. Positive margins were noted in 162 (29.6%) Caucasians and 173 (36.7%) AA, $p=0.016$. Seminal vesicle (SV) invasion was noted in 46 (8.5%) Caucasians and 46 (10.0%) AA, $p=0.420$. Among intermediate risk patients, 92/378 (24.3%) of Caucasians were upgraded to primary Gleason 4 vs. 79/329 (24.0%) of AA, $p=0.919$. Positive margins were observed in 36.2% of Caucasians and 40.4% of AA, $p=0.527$. SV invasion was observed in 12.0% Caucasians and 14.7% AA, $p=0.290$.
Conclusions: Using loose criteria for AS, both Caucasians and AA had a similar rate of eligibility. We found that AA race, with exception of margin status in low risk patients, was not a risk factor for adverse pathological outcome at RP in low and intermediate risk AS patients.

UP-055

Ontario's First 18f Choline Prostate PET Images: Histology and Multi-parametric MRI Correlation

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Introduction and Objectives: Localising and grading prostate cancer (PCa) on *in vivo* imaging could support diagnosis, therapy selection, and possibly focal therapy guidance. Multi-parametric MRI (mpMRI) is being evaluated for these uses, but identifying PCa foci can still be challenging even with mpMRI. ^{18}F-fluorocholine (18FCH) PET has also shown promise for locating PCa. We have established a robust process for registering *in vivo* prostate images to post-prostatectomy digital histology images. We have recently introduced *in vivo* 18FCH PET imaging in an REB-approved prospective study of pathologic validation of multi-modality PCa imaging. We present preliminary progress using what we believe are Ontario's first 18FCH prostate PET images.

Methods: We acquired 3T mpMRI (DW, T2W, and dynamic contrast T1W) and 18FCH PET/CT images of a subject as part of our prospective study. Visible lesions on post-surgery hematoxylin & eosin-stained histology images were contoured and graded. Our software performed 2D-3D affine registrations of histology to *ex vivo* MRI with 0.7 mm error. We registered the reconstructed 3D histology image to *in vivo* PET and mpMRI images, via rigid and thin-plate spline transformations, respectively.

Results: We observed Gleason 3 and 4 PCa foci that were challenging to identify on mpMRI and corresponded to higher 18FCH uptake (SUVmax: foci 3.5-5.4 cf bkg. 2.5) on PET.

Conclusions: 3D registration of mpMRI, 18FCH PET and histology suggests an incremental PCa detection and localisation benefit of 18FCH PET compared to mpMRI alone for our first subject imaged with both modalities. For such patients with 18FCH PET-avid and mpMRI-isointense lesions, 18FCH PET could be promising with great potential for diagnosis and focal therapy guidance.

UP-056

Laparoscopic Robot-assisted Extended Pelvic Lymph Node Dissection for High Risk Prostate Cancer

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Introduction and Objectives: Radical prostatectomy is indicated for selected patients with high-risk prostate cancer. During the procedure, an extended lymph node dissection should be performed for staging purpose. A laparoscopic approach has been proposed for this procedure but has been limited to experienced centres, due to the technical difficulty and the vascular risk of an extended lymph node dissection.

Methods: Robotic-assistance is an alternative of pure laparoscopic procedure and can be proposed to enhance the surgeon gesture in a limited anatomic area while keeping oncological and surgical safety.

Results: The video shows a step-by-step laparoscopic robot-assisted extended lymp node dissection. The robotic assistance offer a 3-D surgical vision and a precise gesture thanks to the endowrist technology of the DaVinci instruments. A complete dissection of the common iliac, external iliac and obturator fossa and internal iliac lymph node dissection is shown, with anatomical landmarks for an ideal template.

Conclusions: Robot-assisted extended pelvic lymph node dissection can be performed as well as the standart open procedure with the same oncological safety.

UP-057

Comparative Morbidity between Salvage High Intensity Focused Ultrasound and Cryotherapy for Radiorecurrent Prostate Cancer

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Introduction and Objectives: High intensity focused ultrasound (HIFU) utilizes focused ultrasound waves to destroy tissues. Wither as primary or salvage modality, HIFU is increasingly being promoted in the management of prostate cancer (PCa). Our primary objective is to assess the adverse events rate after salvage HIFU in patients with radiorecurrent PCa. We compared the results with salvage Cryotherapy (CRYO) adverse events which is another minimal invasive modality.

Methods: We retrospectively reviewed the adverse events of all patients who underwent salvage HIFU for recurrent PCa after Radiotherapy (2006-2010). The first equal cohort of patients who underwent salvage CRYO was selected for comparison (1995-1998).

Results: Salvage HIFU had lower incontinence (4.6% vs. 53%) and urinary retention rate (6.2% vs. 28%). Perineal pain rate was lower in the HIFU group (5% vs. 24%). There was no bladder contracture in the HIFU group. The rate of postoperative hematuria was similar between both

Table 1. UP-057. Postoperative morbidity between salvage HIFU and salvage Cryotherapy.

Variables	Salvage HIFU 2006-2010 (n=64)	Salvage Cryotherapy 1995-1998 (n=64)	*p* Value
Age	67	66	NS
Pre Salvage PSA	3.1	9.2	<0.05*
Incontinence (mild/moderate)	3 (4.6%)	34 (53%)	<0.05**
Incontinence requiring surgery	1 (1.5%)	2 (3.1%)	NS
Perineal pain	3 (5%)	14 (24%)	NS
Recto-urethral Fistula	2 (3.1%)	1 (1.5%)	NS
Urinary Retention	4 (6.2%)	18 (28%)	<0.05**
Gross Hematuria	7 (11%)	7 (11%)	NS
Urethral Sloughing	1 (1.5%)	2 (3.1%)	NS
Bladder Neck Contracture	0	6 (9.3%)	<0.05**
Urinary Tract Infection	6 (9.3%)	8 (12.5%)	NS

* Mann Whitney test; ** Fisher Exact test; HIFU: high intensity focused ultrasound; PSA: prostate-specific antigen.

modalities. Recto-Urethral fistula rate and urethral sloughing were low in both modalities (3.1% and 1.5%, 1.5% and 3.1%, respectively) (Table 1).
Conclusions: HIFU is a feasible salvage procedure in patients with radio-recurrent PCa. Salvage HIFU has lower adverse events in comparison to salvage CRYO in this group of patients.

UP-058

A Nomogram Containing the NF-kappa B p65 Biomarker Predicts Biochemical Recurrence of Prostate Cancer Patients Following Radical Prostatectomy

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Introduction and Objectives: The robust association between the nuclear localization of NF-κB p65 and poor prognosis is well documented in prostate cancer (PCa). However, the potential application of NF-κB p65 as PCa prognostic marker in clinical settings is not yet addressed. Here, we tested NF-κB p65 as variable in clinical nomogram predicting the biochemical recurrence (BCR) to improve the predictive accuracy.
Methods: Primary tumors from radical prostatectomy from a large European PCa cohort served for building tissue microarrays. NF-κB p65 expression was detected by immunohistochemistry on 2,084 cores containing suitable malignant tissue. NF-κB p65 nuclear frequency and its cytoplasmic intensity were quantified by an uro-pathologist. An epidemiologist revisited statistical analyses.
Results: Overall, our analyses confirmed the association between NF-κB p65 and PCa severity. Patients with nuclear NF-κB p65 expression had an increased frequency of BCR (p<0.001), metastasis (p=0.002), and mortality (p=0.005). A novel variable considering the inactive cytoplasmic and transcriptionally active nuclear NF-κB p65 fraction was a strong predictor of BCR in a Cox regression multivariate model. Then we developed a nomogram for the prediction of BCR at 12, 60 and 120 months after radical prostatectomy. The inclusion of NF-κB p65 variable to the base clinical multivariable model improved significantly the predictive accuracy of the nomogram that was increased from 80.51 to 80.74% (p=0.004).
Conclusions: We confirmed that NF-κB p65 predicts the BCR in univariate and multivariate models. The inclusion of NF-κB p65 in nomogram presents a clinical benefit for the prediction of BCR and may improve the decision-making process for more adapted therapies of PCa patients.

UP-059

Management of Post Radiation Therapy Complications among Prostate Cancer Patients: A Single Surgeon Experience

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Introduction and Objectives: While treating prostate cancer with radiation therapy (RT) has proven to be a viable option, some of the resulting complications serve to be challenging to manage and are referred for urologic opinion. We describe a single surgeon experience in the management of post prostate cancer radiotherapy complications.
Methods: Patients previously receiving External Beam Radiation (XRT) or Brachytherapy (BT) presenting back with Urology related difficulties between 2005 and 2010 were retrospectively analyzed. Full hospital and clinic EMR chart reviews were performed.
Results: 15 patients were identified, mean age of 68.9 years, presenting with a total of 42 complications. 10 (67%) patients (27 complications; 64%) had previously received XRT, and 5 (33%) (15 complications; 36%) patients had previously received BT. Of these complications, 24 (57%) were obstructive, 11 (26%) were hematuria, 5 (12%) were incontinence, and 2 (5%) were infections. Upon investigating these patients, 34 (81%) cystoscopies were performed, 6 (14%) urodynamic tests, 1 (2%) prostatic biopsy, and 1 (2%) computed tomography. Managing these patients often required multiple modalities of therapy. Surgical management was used 27 (41%) times, local therapy 18 (28%) times, and medical therapy 20 (31%). The resulting condition of these patients includes 3 (20%) patients that have incontinence, 3 (20%) that self catheterize, 2 (13%) report voiding well, 2 (13%) who underwent cystectomy with ileo-conduits, 1 (7%) with an indwelling catheter, 1 (7%) with continued obstructive voiding, and 3 (20%) awaiting follow-up.
Conclusions: Among RT complicated patients referred for urologic management, the majority suffer from obstructive voiding difficulties, and hematuria. These patients are heavily investigated and require significant resources in their care to optimize their condition. Several treatment modalities are being utilized to treat these patients, and improve their quality of life.

UP-060

Salvage High Intensity Focused Ultrasound for Local Prostate Cancer Recurrence after Brachytherapy

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Introduction and Objectives: Management of patients with recurrent Prostate Cancer (PCa) after Brachytherapy is challenging. These patients might benefit from definitive local therapy. The objective of this study is to assess the safety and feasibility of high intensity focused ultrasound (HIFU) in this group of patients.
Methods: Patients with salvage HIFU for local PCa recurrence after brachytherapy were retrospectively reviewed. All participants had their treatment with (Sonablate® 500) between 2006 and 2011. Patients were followed with prostate-specific antigen (PSA) and transrectal ultrasound guided biopsy. Progression was defined as positive biopsy and/or PSA >nadir + 2 ng/ml.
Results: Thirteen patients underwent salvage HIFU for PCa recurrence after brachytherapy. The mean age was 66.5 year (58.8-72.5) and the

Table 1. UP-060. Clinical and pathological characteristics before both brachytherapy and salvage HIFU

Variables	Brachytherapy		Salvage HIFU	
	Mean	Range	Mean	Range
Base line PSA (ng/dl)	7.1	4.4–11.7	4.4	1.1–9
Prostate Volume (cc)	32	25–39	22.6	13–40
Gleason Score	6	6	7	6–8
Nadir PSA (ng/dl)	0.62	0.18–1.24	0.97	0–4
Time to Nadir (months)	41.8	7.1–75.1	3.17	1.5–6

HIFU: high intensity focused ultrasound; PSA: prostate-specific antigen.

Table 2. UP-060. Adverse events rate after salvage HIFU

Adverse events	Rate (%)
Temporarily worsening lower urinary tract symptoms	9 (75%)
Gross hematuria	3 (25%)
Recto-urethral fistula	2 (16.6%)
Urinary retention	2 (16.6%)
Perineal pain	1 (8.3%)

HIFU: high intensity focused ultrasound.

mean follow-up was 33.7 months (3-68). The clinical and pathological characteristics before brachytherapy and salvage HIFU are summarized in Table 1. All transrectal ultrasound guided biopsy at 6 months post salvage HIFU were negative. The biochemical failure rate was 50%. Additional therapy was required in 50% of patients. The comments adverse event was temporarily worsening lower urinary tract symptoms (75%) (Table 2). Rectourethral fistula rate was 16.6%.

Conclusions: Salvage HIFU is a feasible treatment option for PCa recurrence post brachytherapy with acceptable morbidity rate. Larger cohort of patient and longer follow-up should be carried out to confirm the findings.

Table 1. UP-061

	Group 1	Group 2	*p* value
No.	53	27	
PREOPERATIVE DATA			
Age (year ± SD)	72.3	70.2	0.923
Indications:	0.11		
• Retention	5	7	
• LUTS	47	20	
• Hematuria	1	-	
ASA score:			0.49
• I	36	19	
• II	11	7	
• III	6	1	
DM	6 (11.3%)	6 (22.2%)	0.2
Preoperative prostate medications:			0.58
• None	21	8	
• Alpha blockers	30	17	
• Combination therapy	2	2	
Preoperative anticoagulants	14	5	0.6
Preoperative Q-max	8.3	7.9	0.91
Preoperative PVR	113.5	100.5	0.75
Preoperative IPSS	16.2	16.2	0.34
Preoperative QOL	3.4	3.3	0.33
Mean PSA (ng/mL ± SD)	3.3	2.6	0.38
Mean TRUS volume of the gland (mL ± SD)	21.4	36.8	0.005
OPERATIVE DATA			
Mean energy utilized (KJ ± SD)	54.3	53.1	0.923
E/P ratio = Energy/preoperative TRUS (KJ/mL ± SD)	2.8	1.4	0.01
Concomitant cystolithotripsy	3	3	0.68
POSTOPERATIVE DATA			
Mean catheterization time (days ± SD)	1.59	2.44	0.16
Mean hospital stay (days ± SD)	0.85	0.86	0.93
Early postoperative complications:	0.337		
• Failed TOV/early retention		-	1
Late postoperative complications:	0.108		
• Low grade (Clavien 1-2)			
✓ Retention/catheterization	1	-	
✓ Recurrent UTI	2	1	
• High grade (Clavien 3-5)			
✓ BNC/Re-incision	-	2	
✓ Uretheral stricture/meatotomy	2	-	
✓ Uretheral stricture/urethrotomy	1	-	
Late developed prostate cancer	-	1	0.337

SD: standard deviation; LUTS: lower urinary tract symptoms; ASA: American Society of Anesthesiologists; DM: diabetes mellitus; Q-max: maximum urinary flow rates; PVR: post-void residual; IPSS: International Prostate Symptom Score; QOL: quality of life; PSA: prostate-specific antigen; TRUS: transrectal ultrasound; E/P ratio: energy-to-prostate ratio; UTI: urinary tract infection; BNC: bladder neck closure.

UP-061

Holmium Laser Transurethral Incision of the Prostate (Hol-TUIP): Predictors of Long Term Outcome

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Introduction and Objectives: TUIP is a well-established treatment for small sized BPH (benign prostate hyperplasia). The size limitations and the long-term durability of success are ususally the main concern.

Methods: A retrospective review was done for 80 patients who underwent Hol-TUIP for symptomatic BPH. Patients were stratified into 2 groups, group-I with prostate size <30c.c and group-II with prostate size ≥30c.c. All patients' variables as well as follow-up data were recorded and analyzed.

Results: All preoperative parameters were comparable between both groups except for prostate size (Table 1). All patients had Hol-TUIP with deep incision of the bladder neck using laser energy to create a trough down to the capsule. No intraoperative complications or blood transfusion was recorded in both groups. Early and late adverse events were comparable in both groups ($p>0.05$). After a median of 5.3 years follow-up, significant improvement of IPSS and Q-max was noted between preoperative values and at different follow-up points ($p<0.05$). The percent change in Q-max and IPSS scores was comparable in both groups at different points however; the percent reduction in IPSS score was significantly less at five years in Group-II ($p<0.05$). Overall reoperation rate was 6.2% (5 patients). Re-incision of the bladder neck was indicated in two patients in Group-II. Urethral stricture occurred in three cases in Group-I, where statistically significant more E/P ratio was utilized ($p<0.05$). Retrograde ejaculation was reported in 31% of sexually active men with no significance difference between the two groups.

Conclusions: Hol-TUIP for treatment of BOO due to small sized prostate is a durable and efficient technique. The need for re-incision can be reduced by limiting the procedure to prostate size less than 30c.c. The relation between amount of energy used and its relevance to late sequelae is to be further studied.

UP-062

Evaluation of Autonomic Nervous System Activity by 24-Hour Holter Monitorization in Men with Benign Prostate Hyperplasia

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Introduction and Objectives: To analyze autonomic nervous system activity in patients with lower urinary tract symptoms due to benign prostate hyperplasia; we compared the results of 24-hour-heart rate variability between patients with benign prostate hyperplasia and controls.

Methods: A total of 67 men with lower urinary tract symptoms; storage (58.82±6.55 years) and voiding symptoms (57.67±5.39years) were predominating in 18 and 49 patients respectively. 22 healthy men (59.05±5.38 years) were enrolled in the study as controls. Parameters of 24hour-heart rate variability influenced by sympathetic (mean N-N interval, low frequency and total power) or parasympathetic system (square root of the mean squared differences of successive N-N intervals, and high frequency) and low/high frequency ratio (balance between sympathetic and parasympathetic system) were compared between patients and controls, also between patients with storage and voiding symptom–predominant symptoms.

Results: There was no statistically significant difference between patients and controls in 24-hour-heart rate variability parameters influencing autonomic nervous system. There was also no significant difference between patients with storage and voiding symptom–predominant lower urinary tract symptoms.

Conclusions: Preclinic and limited number of clinic studies revealed the role of sympathetic system in benign prostate hyperplasia. To our knowledge, there is no study determining autonomic nervous system by 24-hour-heart rate variability. Normal systemic autonomic nervous system may raise different responses in lower urinary tract. In order to determine the role of autonomic nervous system in benign prostate hyperplasia; regional status of autonomic nervous system in the lower urinary tract must be considered rather than systemic autonomic nervous system.

UP-063

Randomized Double-blind Placebo Controlled Trial of Intradetrusor Injections of Botulinum Toxin for the Treatment of Refractory Overactive Bladder Secondary to Benign Prostatic Hyperplasia

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Introduction and Objectives: Options for idiopathic overactive bladder (OAB) refractory to medical and surgical management are limited. We assessed the efficacy of botulinum toxin A (BoNT, Botox®, Allergan, Inc., Irvine, CA) in patients with refractory OAB secondary to benign prostatic hyperplasia (BPH).

Methods: This was a phase III, multicentre, randomized, double-blinded study conducted in 2 institutions. The following data represent the results from a single institution. Inclusion criteria included patients with OAB secondary to BPH, refractory to anticholinergic medication and persistent after surgical intervention to relieve obstruction, with an International Prostate Symptom Score (IPSS) >12. Patients were randomized in 1:1 fashion to either 20 injections of intradetrusor 10U BoNT vs. placebo. Six patients received BoNT vs. 7 placebo. Follow-up was performed at 1 week and then 1, 3, 6, and 9 months. Voiding diaries, maximum flow rate (Qmax), post-void residuals (PVR), and IPSS scores were reviewed. The primary endpoint was frequency of micturition, with PVR, IPSS, and Qmax as secondary endpoints.

Results: Baseline characteristics were similar between the treatment groups, although body mass index was higher in the placebo group (32.7 vs. 26.8, $p=0.02$, Table 1). The median age was 67 years, with a median IPSS of 20, Qmax of 13.5mL/s, PVR of 49cc, and 12 voids/day. Patients receiving BoNT demonstrated higher Qmax compared to placebo ($p<0.01$, Table 1) at the 90 days follow-up. Urinary frequency, IPSS, and PVR were unchanged postoperatively in both groups.

Conclusions: Patients receiving BoNT showed a significantly higher Qmax than those receiving placebo. No significant changes in urinary frequency or symptom scores were seen however. Future studies with larger groups and longer follow-up time are needed to help characterize the utility of BoNT in treating OAB secondary to BPH.

UP-064

Evaluation of Prostate Cancer Cells Responsiveness to an EGFR Targeting Combi-molecule

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Table 1. UP-063. Baseline characteristics

	Placebo (n=6)	Botulinum (n=7)	*p*-value
Age (years), mean±SD	66.7±9.6	70±13.2	0.62
BMI (lbs/in²), mean±SD	32.7±3.1	26.8±2.3	0.02
Baseline IPSS, median (IQR)	21 (9–24)	16 (13–23)	0.72
Baseline irritative IPSS subdomain, median	11.5 (6–13)	10 (7–14)	0.89
Baseline Qmax, (mL/s) mean±SD	16.4±6.5	21.8±15.4	0.44
Baseline voided volume (mL) mean±SD	214.3±93.1	227.3±125.8	0.84
PVR (mL), mean±SD	42.8±35.6	38.3±37.9	0.83
Prostate volume (cm³), mean±SD	43.3±28.6	87.1±40.1	0.34
Voiding frequency preprocedure, median (IQR)	12 (10-12)	9 (8–12)	0.28

Introduction and Objectives: Chemotherapies currently used against advanced prostate cancer (PCa) often lead to chemoresistances, which greatly reduce treatment options and patient survival. New therapeutic strategies are essential to broaden the spectrum of remission-oriented chemotherapies while reducing adverse effects. ZR2003, a combi-molecule, contains two active chemical groups. Its quinazoline core (as in gefitinib) is designed to target the EGF Receptor (EGFR) and its hemi-mustard tail (analogous to half the mustard tail of chlorambucil) is known to inflict alkylation-meditated DNA damages. Recent data suggests that ZR2003 efficiently targets EGFR. As PCa progression is often associated with EGFR family of receptors, we hypothesized that ZR2003 could target PCa cells and induce an apoptotic cascade. Our goal was to determine the cytotoxic activity of ZR2003 in PCa cell lines.
Methods: The expression of EGFR and Her2 was determined in four PCa cell lines (LNCaP, 22Rv1, DU145 and PC3) by Western blot. The metabolic activity of DU145 following different ZR2003 doses was then evaluated using a WST-1 assay. The percentage of apoptotic ZR2003-treated cells was evaluated by FACS analysis of Annexin-V/7-AAD staining.
Results: Only DU145 cells overexpress the receptor EGFR. Her2 is highly expressed in LNCaP, 22Rv1 and DU145 cells while very low levels were observed in PC3 cells. DU145 cells treated with 6,5 µM ZR2003 concentration for 48 h induced a 50% decrease of metabolic activity. Moreover, more than 35% of treated cells were apoptotic.
Conclusions: ZR2003 is cytotoxic to DU145 cells expressing high levels of EGFR and Her2. It greatly inhibits metabolic activity after exposure to the drug. The drug also induces a potent apoptotic signal in the same conditions. This therapeutic modality continues to be tested in the preclinical setting and may eventually be useful in a subset of castration resistant PCa patients in the future.

UP-065
Dynamic MRI Urethrography: Fluid Turbulence in a Urethral Stricture Model
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Introduction and Objectives: Spongiofibrosis is an important factor in the pathophysiology of urethral stricture disease and may contribute to the proximal propagation of stenosis. A potential contributing factor to spongiofibrosis is urine extravasation from turbulence and high pressure voiding due to obstruction. Dynamic magnetic resonance (MR) imaging has been used to evaluate fluid turbulence in the vascular surgery literature but its application to urethral strictures has not been assessed. Our goal is to explore the potential of dynamic MRI urethrography to quantify the obstruction and fluid turbulence in the urethra using a phantom model.
Methods: A phantom was built consisting of two parallel 25F tubes with an 8F stenosis in one tube. Each tube was connected to a saline and Gadolinium mixture and pressurized for a flow rate of 25 ml/s. MRI was performed on a 3T (Siemens Tim Trio) and acquired images were Dynamic T1 weighted. Axial and sagittal views were acquired before, during and after the initiation of flow. The experiment was repeated 7 times. Regions of interest (ROI) were placed at the stricture, as well as directly proximal and distal. ROIs were evaluated on the control tubing for reference and flow signals were compared.
Results: There was a strong visible signal drop across the stenosis in the experimental tube when compared to the control. The difference in signal intensity between locations proximal and distal to the stenosis was 74.36 +/-2.58% of the prestenosis value in the experimental versus 94.22 +/-4.23% in the control tube. Paired t test showed p=0.0004, t=8.348, 2 tails.
Conclusions: Dynamic MRI does have utility in quantifying the degree of obstruction and turbulence in a urethral stricture phantom. Patient evaluation with dynamic MRI urethrography may provide both physiological and anatomical assessments. This may further clarify the relationship between urethral urine turbulence and spongiofibrosis in the propagation of urethral strictures.

UP-066
Spicing up Radiation Treatment for Prostate Cancer
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Introduction and Objectives: Radio-sensitizing agents sensitize cells to the lethal effects of ionizing radiation (IR). This permits use of lower doses of radiation to achieve equivalent cancer control thereby minimizing adverse effects to normal tissues. Given their lack of toxicity compounds occurring naturally in the diet make ideal potential radio-sensitizing agents. Capsaicin is the active compound chilli peppers traditionally used to treat chronic pain syndromes; however, recently evidence describes its anti-carcinogenic potential using in vitro prostate cancer (PCa) models. We have demonstrated the radio-sensitizing capacity of in PCa cells in vitro. The objective of the present study is to assess the radio-sensitizing capacity in an in vivo model.
Methods: Athymic nude mice were inoculated with human PCa (LNCaP) cells. Once xenografts reach 100 mm3 forty animals will be randomized into 4 groups (15 /group); control (no treatment), capsaicin alone, ionizing radiation (IR) alone and capsaicin and IR. Treatments were administered over a two-week time period. Capsaicin (5 mg/kg/d) or vehicle was administered 3/week by gavage. RT was delivered to animals as one fraction (6 Gy). Tumors were measured thrice weekly. Tumors were fixed and stained for pathological analyses and IHC evaluation.
Results: There were no differences in the body weight of mice between groups. Two mice experienced mild to moderate inflammation of the stomach. No other toxicities were observed. Mice treated with capsaicin or IR alone had a significant reduction in tumor growth overtime (p<0.001). Mice treated with capsaicin and IR capsaicin had a reduction in the tumor volume greater than either capsaicin alone (p<0.001) or radiation alone (p<0.03). We are currently investigating mechanism.
Conclusions: These studies confirm the radio-sensitizing capacity of capsaicin in PCa xenograft mode. Ongoing studies are further delineating the mechanism of interaction of these treatment modalities.

UP-067
Canadian Urology Resident Scholarly Performance
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Introduction and Objectives: Research activities are an integral component of urology training programs. The objectives of the CanMEDS Scholar are often evaluated through successful research presentations and manuscript publication. Through comparison of scholarly performance of residents before residency with that achieved during residency, we aimed to elicit predictive factors for completion of research activities during residency.
Materials and Methods: Surveys were sent to 152 Canadian urology residents. Survey questions pertained to post-graduate year (PGY), education completed prior to residency and scholarly activity completed before/after the start of residency. The amount of protected research time, existence of a dedicated research rotation, existence of a structured research curriculum and pursuit of fellowship training were also examined.
Results: Surveys were completed by 42 residents from 11 programs. Only 26% of residents indicated their program included a structured research curriculum, 43% had protected research time and 38% had a dedicated research rotation. Of total residents, 45% had published ≥1 manuscript during residency (mean 1.14 +/- 0.32) and 43% had ≥1 manuscript accepted/pending (mean 0.86 +/- 0.25). Of residents 62% completed ≥1 formal research presentation during residency, with 45% having presented a poster and 43% a podium. Only PGY significantly impacted the number of manuscripts published (p<0.001) and formal research presentations (p<0.001) during residency. Of the 86% of residents who intended on pursuing fellowship training, the mean number of publications and presentations during residency was 1.25 +/- 0.37 and 2.25 +/- 0.54, respectively.
Conclusions: PGY significantly impacted quantitative scholarly activity, but the numbers and types of presentations performed prior to residency,

completion of an honors or graduate degree, and plans to pursue fellowship did not.

UP-068

Virtual Problem-based Learning (PBL): A Needs Assessment Examining Traditional versus Virtual Problem-based Learning

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Introduction and Objectives: The University of British Columbia has an increased need for flexibility in undergraduate medicine which can be created using virtual learning. This is a needs assessment of traditional problem-based learning (PBL) and the interest in virtual learning as part of PBL.

Methods: This is a qualitative and quantitative study utilizing focus groups and an electronic survey of 1st and 2nd year medical students at UBC. The data from the focus groups was analyzed using constant comparative analysis to identify themes. These themes were used to determined questions for the survey. Quantitative survey data was analyzed using a Chi-square test.

Results: Two focus groups of 1st and 2nd year students were undertaken to identify themes associated with traditional versus virtual PBL learning. The dominant theme from 1st and 2nd year focus groups was concern over the loss of life-skills acquired during face-to-face PBL. The second most prevalent theme identified was the benefit of flexibility and convenience associated with virtual PBL learning. 73% of 1st year and 17% of 2nd year students responded to the electronic survey. 59% of 1st year and 43% of 2nd years felt that face-to-face interaction of PBL was "critically" or "strongly important"(p<0.005). 29% of 1st year and 61% of 2nd year students wanted a hybrid of both virtual and traditional PBL (p<0.005). 17% of 1st year students and 36% of 2nd year students felt that the addition of virtual PBL would be most beneficial during the 2nd undergraduate year (p<0.005). 66% of 1st year students did not want virtual PBL as part of their undergraduate curriculum.

Conclusions: 1st year students were more strongly guarded than 2nd year students about using virtual PBL. Both groups felt it could be complementary in 2nd year. Respondents felt that a "hybrid" of a virtual and face-to-face experience later in 2nd year training would allow students to benefit from flexibility and convenience provided by virtual learning.

UP-069

A National Survey of Chief Residents on the Communicator Role in Urology Residency: Are We Communicating the Message?

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Introduction and Objectives: We sought to assess Urology residents' perceptions and attitudes toward the Communicator Role as defined by CanMEDS, and the current effectiveness of education aimed at this crucial competency.

Methods: An anonymous, cross-sectional, questionnaire administered to all final year Urology residents in Canada from two consecutive graduating years (2010-2011). A closed-ended 5-point Likert scale was used to assess familiarity with the Communicator Role and its importance to training and practice. Descriptive and correlative statistics were used and for ease of reporting, an agreement score was created for those responding with "strongly agree" and "agree".

Results: Response rate was 100% (N=58). Only awareness of communication as part of objectives, and ability to list all 7 roles were statistically different between years (p=0.01, p=0.03). Only 45% could identify the correct number of CanMEDS roles, and only 19% could correctly list all seven roles. The vast majority was aware of the Communicator role, and most believed it to be important for practice. This is in stark contrast to perceived formal training. A minority (38%) agreed that formal training or mentorship in communication was available at their institution, and only 38% felt that communication had been addressed during explicit sessions. Despite 84% of residents noting a significant mentor/role model to emulate with 93% aware that communication is part of their evaluations, only 48% believed that faculty frequently addressed communication during clinical learning experiences.

Conclusions: Despite knowledge and acceptance of the importance of the Communicator Role, there is a perceived lack of formal and informal training of this essential role of Urology residency. It would seem apparent that there is a need for a redoubling of efforts to ensure appropriate instruction and evaluation in our training programs.

UP-070

Is Online Script Concordance Test a Good CPD Tool to Induce Reflection on Controversial Issues in the Management of Prostate Cancer?

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Introduction and Objectives: The Continuing professional development (CPD) programs usually available for urologists aim at the acquisition of new knowledge, including 'true of false' and 'multiple choice' questions. Few programs aim to induce reflexivity on practice, in context of uncertainly, where the answers are not 'black or white'. The purpose of this project is to design an innovative e-learning format that induces, through the use of script concordance tests (SCT), reflection on controversial issues in clinical practice. Program design and delivery.

Methods: Using needs assessment results, a committee identified the most common controversies associated with prostate cancer. The program comprises 7 cases, each followed by a set of questions assessing the impact of additional information on specific clinical decisions. A panel of experts provided answers for the questions and shared educational material to support their positions, which were incorporated into the web platform. Participants complete the program individually online. They answer the SCT questions (pre-test), compare their choices (scores) with those from the experts, read the enduring educational material, comment on experts' opinion in the forum, answer the SCT questions a second time (post-test), and then complete an evaluation form.

Results: 19 Canadian urologists validated the program. 78% (n=15) demonstrated a 'high interest' for the program content and format, 10% (n=2) indicated a 'medium' interest. 89% (n=17) confirmed their intention to continue the program, as they will receive a new case monthly through the web platform. Factors motivating participation are: experts 'opinion, excellent literatures review on the platform, program induces reflection on own practice, cases are clinically relevant.

Conclusions: The Script Concordance Test, for CPD was very well received by a group of Canadian urologists. The next step consists of measuring the clinical impact of this SCT program.

UP-071

A Systematic Review on the Effect of Lysine Analogs on Blood Loss and Transfusion Requirements during Pelvic Surgery

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Introduction and Objectives: Major pelvic surgery is frequently associated with blood loss requiring transfusion. Lysine analogs have been shown to decrease blood loss during cardiac and orthopedic surgery. The purpose of this systematic review was to detail and summarize trials that have evaluated the effect of lysine analogs during pelvic surgery.

Methods: A systematic and comprehensive search strategy was used. Studies were eligible if they reported perioperative administration of a lysine analog (tranexamic acid, aminocaproic acid, or aminomethylben-

zoic acid) for a surgical procedure involving the pelvic region (digestive, urogenital, musculoskeletal, neurovascular, or integumentary). Studies evaluating trauma surgeries were excluded. Data extraction was duplicated by two trained reviewers on standardized electronic forms.
Results: The search strategy identified 2,660 citations that were screened (titles/abstracts) for eligibility. We obtained full-text versions of 68, of which, 30 were eligible. These 30 reported 34 trials that enrolled a total of 3,345 patients. Studies were published between 1961 and 2009 (half before 1971), and enrolled 8 to 515 patients (mean=96). Twenty-two studies tested aminocaproic acid, none tested aminomethylbenzoic acid, and 12 tested tranexamic acid. Across pelvic surgeries, lysine analogs decreased the risk of receiving at least one unit of blood by 31% (RR: 0.69, 95% CI 0.47 to 1.00). The pooled estimated decreased blood loss due to lysine analogs was 65.1 ml (95%CI: 29.5 to 100.6).
Conclusions: Despite significant evidence supporting the use of lysine analogs in cardiac and orthopedic surgery, there are few studies exploring the benefits and harms associated with lysine analogs during pelvic surgery. Trials that have been conducted in pelvic surgery do suggest a benefit, but are inadequate in quality and quantity to inform clinical practice. Clinical trials on the effect of lysine analogs during major pelvic surgery are warranted.

UP-072

Antibiotic Prophylaxis Prescribing Patterns for Trans-urethral Resection of Prostate: a Need for Canadian Guidelines?

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Introduction and Objectives: We set out to determine practice patterns amongst Urologists with respect to antibiotic prophylaxis for trans-urethral resection of prostate (TURP) and greenlight laser photovapourization of prostate (PVP). Preliminary analysis of a large ongoing study was conducted to determine its feasibility.
Methods: A retrospective chart review of 68 patients undergoing TURP in November 2009 in Calgary was completed. Antimicrobial prescribing patterns (preoperative, perioperative, postoperative) of 14 Urologists were recorded. Antibiotics administered 3 hours prior to and 24 hours post procedure were included. Additional data included patient demographics, presence of an indwelling catheter and pre/postoperative urine culture results. Patients were further categorized as undergoing elective versus emergent surgery. The primary outcome was compliance to the AUA's published "Best Practice Statement on Urologic Surgery Antimicrobial Prophylaxis" for TURP.
Results: Of the 68 patients reviewed 18 had preoperative indwelling catheters and 12 underwent TURP on an emergent basis. In total, 7 preoperative antimicrobial prescribing patterns were identified, which varied based on individual surgeon and the nature of the surgical case. Overall compliance to AUA best practice statement was 90%. Poor compliance was noted for patients with indwelling urinary catheters (17%).
Conclusions: Antimicrobial prescribing patterns prior to TURP vary considerably at our institution, with significant cost-benefit implications. Formal guidelines may significantly improve the rates of postoperative urinary tract infections as compliance with AUA best practice statement was lower than anticipated. Our pilot project suggests larger scale studies are warranted to determine optimal antimicrobial prophylaxis strategies prior to TURP and PVP.

UP-073

En Bloc Vascular Stapling of Renal Hilum during Laparoscopic Nephrectomy

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Introduction and Objectives: Classically, it is recommended to separately perform the ligation and division of renal hilar vessels during nephrectomy to prevent arteriovenous fistula formation. Although described rarely following open nephrectomy, an arteriovenous fistula has never been reported following laparoscopic nephrectomy. In this study, we demonstrate the safety and feasibility of en bloc stapling of the renal hilum as a standard approach to laparoscopic nephrectomy and nephroureterectomy in the community setting.
Methods: This retrospective review included all laparoscopic nephrectomy and nephroureterectomy cases performed by 4 surgeons from Sept 2007 to Aug 2011. Each case involved two urologic surgeons in a mentorship capacity. Surgical outcomes were compared between the en bloc stapling and individual vessel ligation groups. A chart review was performed using the integrated health authority online charting system, which includes all subsequent emergency room visits and hospital-based imaging in the Fraser Valley.
Results: 70 cases were included. 47 (67%) cases received en bloc vascular stapling while 18 (26%) received individual vessel ligation. 5 (7%) cases required open conversion. Operative times were significantly shorter in the en bloc vs. individual vessel ligation group (140 vs. 225 minutes; $p<0.05$, respectively). No bleeding complications, open conversions, emergency room visits, or postoperative images demonstrated complications related to the technique used for renal hilar control.
Conclusions: Laparoscopic control of the renal hilum is one of the more difficult tasks to become proficient with when learning laparoscopic nephrectomy. En bloc stapling of the renal hilum provides a safe and efficient approach to laparoscopic nephrectomy and encourages urologists to incorporate laparoscopy into standard practice. Few cases of arteriovenous fistula have been reported after open nephrectomy but are rare and not due to vascular stapling devices.

UP-074

Evaluation of Autonomic Nervous System Activity by 24 Hour Holter Monitorization in Women with Idiopathic Overactive Bladder

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Introduction and Objectives: To analyze autonomic nervous system (ANS) activity in patients with idiopathic overactive bladder (iOAB); we compared the results of 24 hour- heart variability (HRV) between iOAB patients and healthy controls.
Methods: A total of 43 women with iOAB (mean age: 47.6±13.5 years) and 23 healthy controls (mean age: 44.6±2.5 years) were enrolled in the study. Parameters of HRV influenced by sympathetic (mean N-N interval [SDNN], low frequency (LF) and total power [TP]) or parasympathetic system (square root of the mean squared differences of successive N-N intervals [RMSSD], and high frequency [HF]) and LF/HF ratio (which represents the balance between sympathetic and parasympathetic system) were compared between patients and controls.
Results: All the patients' laboratory results were within normal limits, and no significant differences were found between patients and controls as for age, body weight, body mass index, menopausal status. On time domain analysis, SDNN, RMSSD and mean heart rate of the patients with iOAB were higher than the control group without statistically significant difference. On frequency domain analysis, HF was higher, while TP, LF and LF/HF ratio were lower in the iOAB group without statistical significance.
Conclusions: To our knowledge, there is no study determining ANS functions by 24 hour - HRV recording in women with iOAB, and we didn't find any difference between control subjects and patients with iOAB as for HRV variability. iOAB patients may have a global ANS disturbance, as a response to unknown etiology rather than an etiologic factor for iOAB.

UP-075

Seasonal Variation in Urological Pelvic Pain Syndromes: Seven Years of Google™ Search Trends

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Introduction and Objectives: Anecdotal evidence suggests a seasonal variation in flares in urologic chronic pelvic pain syndromes. Google search history has been validated for confirming seasonal correlations in viral and cold outbreaks, lyme disease peaks, and kidney stone frequency trends. We used a similar methodology to assess the hypothesis that there is indeed a seasonal variability in symptoms of interstitial cystitis (IC) and prostatitis.

Methods: The search term "interstitial cystitis" (IC) and "prostatitis" were each evaluated though Google Insights for Search in Canada over the period of 2005-2011. New York State was used as a control for Canadian data. Interval scale data obtained from the tool was then compiled and analyzed using a generalized linear model assuming a Gaussian distribution and an identity link. Mean Google trend scores were compared across the various groups using a t-test for unpaired data.

Results: Longitudinal assessment of IC and prostatitis over the 7 years revealed no obvious pattern. In average monthly searches, no significant year difference was appreciated for either IC (p=0.643) or prostatitis (p=0.892). No significant difference between months, or seasons was demonstrated for IC (p=0.285 and 0.937 respectively) and prostatitis (p=0.120 and 0.446 respectively). The New York data similarly showed no significant seasonal differences (p=0.512).

Conclusions: There is no seasonal variation in Internet search patterns for urological chronic pelvic pain syndromes. We were unable to prove that that IC and prostatitis symptoms are typically seasonal.

UP-076

Sub-inhibitory Antibiotic Concentrations Negatively Affects Both the Uropathogen Staphylococcus Saprophyticus and Host Immune Responses

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Introduction and Objectives: Staphylococcus saprophyticus is the most common Gram-positive uropathogen and is only second to E coli as the most frequent cause of uncomplicated and recurrent urinary tract infections (UTI) in young females. While the effects of sub-inhibitory concentrations of antimicrobials on multiple organisms have been studied, still little is known regarding S. saprophyticus response. This may represent an important oversight since transiently low antimicrobial concentrations are present in patients undergoing prophylactic therapy for recurrent UTI.

Methods: The effects of sub-Minimum Inhibitory Concentrations (MIC) of ciprofloxacin, ampicillin and gentamicin on S. saprophyticus attachment to glass microscope slides were tested. Using sub-MIC of ciprofloxacin, the adherence to ureteral stent material and T24 bladder cells, as well as pro-inflammatory cytokine expression in bladder cells were assessed. The ability of sub-MIC antibiotics to enhance survival against subsequent bactericidal challenge was measured.

Results: Adherence to microscope slides, ureteral stent material and T24 bladder cell monolayers were significantly increased in the presence of sub-MIC levels of antibiotics. While S. saprophyticus challenge of T24 bladder cell monolayers significantly upregulated both IL-6 and IL-8 expression, the addition of sub-MIC ciprofloxacin abrogated these effects. Pre-treatment of S. saprophyticus with sub-MIC antibiotics improved its ability to survive subsequent treatment with typically lethal concentrations of the same agent.

Conclusions: Exposure to sub-MIC antibiotics increases S. saprophyticus adherence to both abiotic and biotic surfaces. Low levels of ciprofloxacin downregulate pro-inflammatory cytokine secretion in bladder cells. These changes may improve its ability to colonize the urinary tract, highlighting the need for clinicians to consider the impact of sub-inhibitory concentrations of antimicrobials when treating recurrent UTI.

UP-077

First Inflatable Penile Prosthesis Infections and a Proposed Survey for Post-implant Monitoring

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Introduction and Objectives: We report on virgin inflatable penile prosthesis (IPP) infections and propose a follow-up survey for monitoring post-implant infection.

Methods: A single centre retrospective review of 149 men with first IPPs implanted for impotence from 1998-2011. Patient, device and operative factors were analyzed (Mann-Whitney U test for continuous and Fisher's exact test for categorical variables) for association with IPP infection.

Results: A total of nine (6.0%) first implants had culture-confirmed infection at revision: 6 were removed and 3 were salvaged at the initial revision. Median time to infected IPP revision was 3.1 months (range 0.7-41.8 mos.), compared to 20.2 mos. (range 4.5-95 mos.) for mechanical failure, p=0.004. 1 salvaged man complained only of genital pain (no clinically apparent infection). At 1 hospital, mean initial operative (OR) time for 4 IPPs that developed infection was 123.0 ± 32.0 minutes, compared to 86.7 ± 11.1 mins for 36 uninfected prostheses. Age, obesity, diabetes, surgical approach (penoscrotal versus infrapubic), presence of a drain at the end of surgery, prosthesis or rear-tip extender length, and IPP antimicrobial coating did not affect infection-related revisions (each p>0.1).

Conclusions: IPP infections present sooner for revision than mechanical failure, but the rate of salvage lags behind removal. Detecting persistent pain or other signs of subclinical infection may increase salvage. We, therefore, propose the Monitoring After Penile Prosthesis (MAPP) score: a repeatedly administered post-implant patient survey grading severity as 0-none, 1-mild, 2-moderate, 3-severe for each of erythema, induration, swelling, drainage, and pain with device use (activation/deflation/ejaculation); MAPP can be supplemented with the common 0-10 regional pain scale. We plan to prospectively evaluate how MAPP score trends affect revision rates. Shorter OR time may be key in reducing the incidence of IPP infection.

UP-078

How Many Semen Samples Are Required to Make the Diagnosis of Azoospermia?

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Introduction and Objectives: Many guidelines now suggest that men are diagnosed as being azoospermic when no sperm is found in two sequential semen samples. Men have a significant degree of variability of sperm counts possibly due to variability in sperm production. This has led us to speculate that some men with non-obstructive azoospermia may also have variability in sperm production and hence might have enough sperm production to lead to sperm in the ejaculate. The study objective was to determine how many men who would typically be defined as being azoospermic had sperm in the ejaculate on subsequent testing.

Methods: A retrospective study was performed by using a database containing the semen analyses results of patients referred to our centre. Patients with a minimum of three semen samples, each within a space of 6 months, with the first two showing azoospermia were identified. Medical records were reviewed and patients with obstructive causes such as a vasectomy or a corrective procedure such as a varicocelectomy were excluded.

Results: In all, 120 men with a total of 420 semen analyses were included in the analysis. In men with two initial azoospermic samples, 27 out of 120 (22.5%) had sperm on the third sample. Eight (29.6 %) of these patients had rare non-motile sperm, whereas the mean and median spermatozoa counts in the remaining men (19/27: 70.4%) were 0.54 and 0.4 million respectively. Four of 41 (9.7%) men with three initial azoospermic

samples had spermatozoa on the fourth sample. The average motility overall was 21.4%. Finally, none of the 17 men who were azoospermic after four samples had any sperm identified in subsequent tests.
Conclusions: This study suggests that at least 3 semen samples should be examined before making the diagnosis of azoospermia. In addition, more than 20% of men who would have originally been diagnosed as azoospermic had enough sperm in the subsequent semen specimens to use in a program of intra-cytoplasmic sperm injection.

UP-079

Fertility of Patients with a History of Bilateral Cryptorchidism Treated: a Comparative Study about 120 Patients

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Introduction and Objectives: Assessing fertility (sperm and the rate of surgical sperm collection) in a population of patients with a history of treated bilateral cryptorchidism.
Methods: Retrospective and comparative study made in a department of urology and obstetrics and gynecology department of 120 patients aged between 18 and 30 years divided into four groups: group I (30 patients with bilateral testicular lowering), group II (30 patients with unilateral testicular lowering) Group III (30 patients with untreated bilateral testicular ectopia), group IV (30 patients with untreated unilateral undescended testes). A semen analysis and a testicular sperm extraction (TESE) was performed. We studied the reduction of age before or after the age of ten. Then we studied the different parameters of semen analysis, and calculated the rate of positive surgical extraction of sperm according to these different. Then, we studied the rates of successful TESE according to these various characteristics.
Results: The mean age was 28.6 years. A great majority of the patients (81.2%) has benefited of an orchidopexy before the age of 7 years, which does not seem to represent a factor of better forecast of surgical extraction of sperm cells. In the subgroup of the bilateral cryptorchidy, the rate of extraction was 66%. In the subgroup of the one-sided cryptorchidy, it was 63%. The sperm was altered in 78% of patients with a history of cryptorchidism.
Conclusions: For us, history of cryptorchidism is an etiology of relatively good prognosis for infertility, since the rate of TESE with positive sperm retrieval is 65%. In our population, the subgroups of patients whose FSH is normal and/or whose testicular volume is higher than 10 cm3 are those whose forecast is still better, because the rate of TESE with positive sperm retrieval is 75%.

UP-080

Spectrum of Ureteropelvic Junction Obstruction (UPJO) Morphological Characteristics from Infancy to Adulthood and Implications in Surgical Management

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Introduction and Objectives: UPJO is prevalent in children and adults, however mode of presentation and anatomical features can vary with age. We sought to compare morphological aspects of UPJO in different age groups and possible implications in management.
Methods: Retrospective review of patients undergoing dismembered pyeloplasty from 2005-2011 in 2 centres (1 pediatric and 1 adult). Redo cases, secondary UPJO and patients without a retrograde pyelogram (RPG) were excluded. Data collected: age, side, length of the stenotic segment (LSS) and presence of crossing vessel (CV). LSS was determined by a ratio (LSSR) measured in pixels on the RPG: LSSR= length of the obstructed segment/height of a lumbar vertebrae taken perpendicular to the mid-portion of its body. Patients were divided in 4 age groups: 1) 0-5, 2) 6-10, 3) 11-18 and 4) >18 years old.
Results: Age range was 1 month -79 years for the entire cohort (mean 42 months and 41.2 years for children and adults, respectively). 90 children (< 18 years old) and 67 adults were included. Obstruction was left-sided in 74% of the pediatric and 43% of the adult group. There was no difference in the incidence of CV across groups 2-4(around 40%); group 1 had a significantly lower CV rate (10%). LSSR was significantly longer in group 1(0.6) with a progressive substantial decrease being observed throughout groups 2 and 3 (0.33, 0.38) and into adulthood (0.1). Only in group 1 the presence of CV was associated with a significantly lower LSSR (p=0.04).
Conclusions: UPJO has distinct features with progression of age. Young children usually have intrinsic, longer segments of obstruction and the rare occurrence of CV is associated with a shorter length of obstruction. In older children and adults, the length of the obstruction is progressively shorter and not impacted by the higher incidence of CV. Our data support routine RPG as beneficial in the surgical planning for infants and young children and challenge its use in older children and adults.

UP-081

The Challenge and Morbidity of Intermittent Ureteropelvic Junction Obstruction (IUPJO) in Children

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Introduction and Objectives: IUPJO represents a diagnostic challenge. Our goal was to evaluate potential pitfalls in the diagnostic process and the morbidity associated with IUPJO.
Methods: Retrospective review of children undergoing pyeloplasty (PP) in a 10-year period. Only patients presenting with intermittent abdominal pain and absence of or grade 1 SFU hydronephrosis (HN) were included. Demographics, duration of pain, yield of imaging tests, surgical procedures, resolution of symptoms postoperatively were collected.
Results: 18/455 patients having PP (4%) were included. Mean age was 10 years (6-15) with male (78%) and left-sided UPJO (67%) preponderance. Pain location was flank in 15/18(84%) patients and mean duration was 2 years (3 months-7 years). Nausea/vomiting and exacerbation by fluid intake were present in 50% and 33%, respectively. Mean number of imaging studies (US, CT scan, nuclear scans, IVP and MRU) before PP was 5.5 (2-12). Total number of nuclear scans was 26, but only 5(19%) were abnormal. Imaging during pain had the best diagnostic yield: US and CT revealed severe HN in 6/7 and 2/2 patients, respectively. In 9/18 (50%) patients, a "stress" test with a fluid load and furosemide mimicked symptoms without an abnormal imaging result in 7/9. One patient underwent laparoscopic appendectomy with persistence of pain and 3 patients had a stent insertion before PP (pain relief in 2). 6/18(33%) patients had crossing vessels. Dismembered PP was performed in 17 patients and laparoscopic angiopexy in 1; symptomatic resolution was achieved in 15/18 (83%).
Conclusions: IUPJO was more common in males and usually presented with flank pain associated with nausea/vomiting. Diagnosis is challenging and ideally achieved with imaging performed at the time of the pain episode. "Stress" tests may be helpful for mimicking symptoms, but not necessarily will translate into abnormal results. IUPJO requires a comprehensive approach with a realistic expectation of improvement after PP.

UP-082

Role of Magnetic Resonance Urography in Girls with Urinary Incontinence: a Single Centre Experience

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Introduction and Objectives: Ectopic ureters (EU) associated with continuous urinary incontinence are often difficult to diagnose despite routine imaging modalities. However, superior anatomic delineation provided by magnetic resonance urography (MRU) may be useful in assessing these patients. This study aims to determine the utility of MRU in the evaluation of EU.

Methods: Between November 2007 and July 2011, 17 females who failed different therapeutic intervention for incontinence underwent MRU to rule out a EU, using a Philips 1.5T and 3T MRI scanners. All patients had prior imaging studies for work up (17/17 Renal ultrasound, 3/17 VCUG, 10/17 Renal scan). The medical records were retrospectively reviewed and MRU findings re-examined by a single pediatric radiologist prior to correlation with intraoperative surgical findings.

Results: Mean age at the time of the MRU was 8.3 years (4-14). Out of 17 patients, 9 (53%) had findings of lower urinary tract anomaly (LUTA) based on MRU. Of the remaining 8 (47%) patients, MRU was either normal or showed duplex kidneys with orthotopic ureters (OU). Of 9 cases with LUTA, MRU suggested the presence of EU in all patients but one case that was diagnosed with persistence of uro-genital sinus and underwent surgical correction. In the remaining 8, the decision to proceed with surgery was made. One child is awaiting surgery. Of those who underwent surgical intervention, 5 of 7 (71.4%) were confirmed to have EU intraoperatively and underwent surgical correction. Two patients (28.6%) had complete duplication of their collecting system with OU confirmed by cystoscopy and retrograde pyelogram.

Conclusions: In girls suspected of having ectopic ureters and when routine imaging modalities are indeterminate, MRU could be beneficial in delineating urinary tract anomalies. Further refinement of the MRU technology and analysis will be needed to enhance its sensitivity in depicting lower urinary tract anatomy.

UP-083

Peristeen Anal Irrigation as a Substitute of Mace Procedure in Children Who Are in Need of Reconstructive Bladder Surgery

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Introduction and Objectives: To evaluate the efficacy of Peristeen® Transanal irrigation (TI) system as a substitute of The MACE procedure in children who need reconstructive bladder surgery.

Methods: We prospectively evaluated children with neuropathic bladder and bowel dysfunction who were planned for reconstructive bladder surgery and MACE procedure. All patients were started on Peristeen® TI system at least 3 months before surgery to assess their response. The patient's bowel function, the frequency of using the system, patients and parents satisfaction and diaper independency were evaluated.

Results: Between 2007 and 2010, thirteen patients were included in our evaluation, 9 females and 4 males. The mean age of the group was 8.6 years (range 4-15 years). Ten patients (76.9%) showed complete dryness from stools. Of them, six children (60%) were able to be diapers free, while 3 patients continued wearing diapers due to fear of soiling and 1 patient due to urinary incontinence. All ten children and their parents were satisfied by using Peristeen®. They underwent reconstructive bladder surgery and were continued on Peristeen® with the same results postoperatively. All of the ten patients were using Peristeen® twice weekly. Three children (23.1%), however, failed to respond adequately to Peristeen®. Two of them required concomitant MACE procedure with reconstructive bladder surgery, while the third patient and family refused any surgical options and continued on pharmacological management.

Conclusions: Our initial results suggest Peristeen® TI system to be a successful conservative substitute of MACE procedure in children who require reconstructive bladder surgery.

UP-084

Hemorrhagic Cystitis Secondary to BK Virus: A Case Report of Management with Intravesical Cidofovir in the Pediatric Patient and Review of Literature

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Introduction and Objectives: Cidofovir is a nucleoside analogue that has gained popularity in recent years for treatment of viral induced severe late hemorrhagic cystitis (HC) following hematopoietic stem cell transplantation (HSCT) in the adult population. It is administered intravenously although its adverse effects including marked renal toxicity are well described. Viral HC refractory to supportive care and intravenous cidofovir represents a particular challenge to the physician.

Methods: Several case reports within the adult population have described the use of intravesical cidofovir in the management of refractory viral HC with successful outcomes; however no similar cases exist within the pediatric population in English literature. Here, we describe the use of intravesical cidofovir in a pediatric patient with severe refractory BK virus HC, several months post HSCT, with significant improvement of lower urinary tract symptoms and hematuria.

Results: The patient received a total of two instillations of cidofovir (5 mL/kg) in 60 mL normal saline on day +240 and +247 post HSCT.

Conclusions: Intravesical cidofovir may represent an effective and well-tolerated treatment in the management of refractory viral HC in both the adult and pediatric populations.

UP-085

The Use of EMLA Cream During Circumcision: A Prospective Study about Sixty Children

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Introduction and Objectives: Showing the effectiveness of EMLA in this new indication.

Methods: A prospective study was designed to assess the quality of skin analgesia provided by the EMLA anesthetic cream during circumcision in 60 children. The children, aged 3 months to 11 years, and scheduled for circumcision, were allocated to two groups, those aged ≤5 years (3 to 58 months, n=32), and those aged >5 years (60 to 130 months, n=28). Cream (1.6 ± 0.6 g) was applied in the room like a thick layer on the skin area to be anesthetized (along the penile skin, the root of the penis until the foreskin and on the glens), and covered by a plaster closed.

Results: This method required 2.6 ± 1.7 min, and was considered very easy (92%) or easy (8%). Circumcision was performed 93 ± 52 min after application of the cream. Children aged ≤5 years complained of a pain intensity of 7 ± 1.2 (CHEOPS scale, range 4-13) and, for those aged >5 years, 22 ± 21 on a visual analogue scale (range 0 to 100). Local adverse events occurred in six patients (pale skin, erythema, or both).

Conclusions: The coetaneous analgesia by EMLA cream during circumcision was measured, and statistical analysis of results shows the effectiveness of EMLA in this new indication.

UP-086

Glandular Amputation during Circumcision: A Review of 12 Cases Results of a New Technique for Glans Self-transplantation

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Introduction and Objectives: To assess the clinical features and describe a successful new surgical treatment of the glandular amputation during circumcision.

Patients and Methods: Retrospective study of 12 patients who suffered glandular amputation during circumcision. The medical charts of patients were studied. 7 patients brought with the cut segment of the glans, within a period of time less than 4 hours. Group 1: 4 patients underwent reimplantation after urethral anastomosis and anastomosis interesting the two

parts of the glans and corpora cavernosa without achieving the shunts. Group 2: 3 patients had the same method but with the realization of several shunts every 4 hours for 72 hours. The other 5 patients had a tummy by performing a skin graft. All patients were seen every two months. Sensibility the glans and erection were studied.
Results: The mean age of these patients was 3.6 years, 7 patients (58,3%) were presented with complete glandular amputation. The mean time to consultation was 2 hours (ranged from 30 minutes to 8 hours). The relocation of the glans was carried out immediately. The average duration of operation was 70 mn. The average length of hospital stay was 16 days. For the group 1, glandular reimplantation was unfortunately failed (necrosis of the gland was noted on the third day), two of them had narrowing of the meatus again treated by méatoplasty. A success was noted for all patients in Group 2, one patient will builds a stricture at the anastomosis area in the third month, treated by internal urethrotomy with a good evolution. Susceptibility of the glans and erection were preserved in group 2.
Conclusions: The new technique of reimplantation of the glans with the realization of a shunt is an effective technique for treatment of glandular amputation.

UP-087

Cystic Intratesticular Lesions in Pediatric Patients: a Retrospective Case Series

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Introduction and Objectives: Intratesticular cysts are a rare clinical entity in the pediatric population for which a paucity of data exists to guide optimal management. Traditionally, orchiectomy was performed, and more recently, testes sparing surgery has been recommended. We share our experience with the management of pediatric testicular cysts.
Methods: A retrospective review of all pediatric patients referred for intratesticular cysts was conducted at a single pediatric urology institution from 2002-2010. Charts were evaluated for patient demographics, diagnosis, and management.
Results: Seven patients were identified and included in this case series.
Conclusions: All of the cystic lesions in our case series were benign with one undergoing complete resolution. The remainder became smaller and developed a solid component prompting surgery. The pre-pubertal findings of ITGCN in two of the seven patients raise a clinical dilemma regarding the natural history and optimal long-term management for these patients. Initial conservative observation is an option for the majority of pre-pubertal cystic testicular lesions until such time that testis sparing surgery is deemed technically feasible. Testes sparing surgery should be advocated in those patients undergoing surgical management.

UP-088

Retrospective Review of Diagnosis of Testicular Torsion in Boys Presenting to Pediatric Emergency Department with Acute Scrotal Pain

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Introduction and Objectives: Testicular torsion is a common acute condition in boys requiring prompt and accurate diagnosis. The objective was to evaluate ultrasound (US) accuracy, clinical predictors, and review urology care of boys presenting to the Stollery pediatric emergency department (ED) with acute scrotal pain.
Methods: Retrospective review of US, surgical and ED records for boys aged 1 month to 17 years, presenting with acute scrotum from 2008 to 2011, was performed. Age, demographics, clinical symptoms, physical findings, US and surgical techniques, findings and diagnoses were recorded.
Results: 342 patients presented to the ED with an acute scrotum and were diagnosed with: 35 (10%) testicular torsion, 12 (3.5%) possible torsion-detorsion, 3 (0.9%) torsion of appendix testes, 135 (39%) epididymo-orchitis, and 157 other. Diagnostic accuracy of US was 96% for torsion, using surgical diagnosis as gold standard. Six torsion patients went directly to the OR without an US. The US finding of heterogeneity of testes on ultrasound was not statistically associated with orchiectomy (p=0.09). Mean time from ED to US and surgery for torsion patients was 159 and 303 minutes respectively. Twenty-four patients had salvageable testes (68.6%). Mean time from symptoms onset until surgery between the non-salvageable and salvageable groups was not significantly different at 1714 min and 1127 min (p=0.36). Sudden-onset scrotal pain (88%), abnormal position (86%) and absent cremasteric reflex (91%) were most prevalent in torsion patients.
Conclusions: Color Doppler US is accurate and sensitive for diagnosis of torsion in the setting of acute scrotum. Despite concerns with necrosis, a finding of heterogeneity was not associated with orchiectomy or atrophy. Salvage rate is consistent with previous publications, but time to surgery needs to be reduced.

UP-089

Penoscrotal Lymphedema: Sexuality, Fertility, Functional and Aesthetic Outcome of the Surgical Treatment - Our Experience about 14 Cases

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Introduction and Objectives: To evaluate the sexuality, the fertility, and aesthetic outcome of the surgical treatment of patients with penoscrotal lymphedema (PSL).
Methods: From January 2000 to December 2010, we treated 14 patients with PSL using reconstructive surgery. Patients underwent a testosterone dosage, testicular Doppler ultrasound, a semen analysis prior to reconstructive surgery. A testicular biopsy and a pathological examination of the excised tissue were analyzed. Sexuality was assessed by a routine questionnaire about Sexual function (Penetration, Partner satisfaction, Pain during erection) and by a score IIEF15.
Results: The mean patient age was 39 years (range 18-52). The median follow-up time was 64 months (range 12-120). The average duration of disease progression was 12.8 years (6-28 years). The disease was congenital in 5 patients and secondary in 9. Association with lymphedema of the lower limbs was found in 7 patients. Preoperative semen analysis done in 9 patients has been altered more severe in case of congenital elephantiasis. After reconstruction, there was no significant improvement of semen analysis. The rate of testosterone was normal. Testicular biopsy and testicular ultrasound were not noted with particular aspects. All parameters of sexuality were disturbed before surgery, improved slightly after surgery, five patients remained impotent. Despite an improvement in the quality of life, all patients are dissatisfied with their sexuality.
Conclusions: Penoscrotal elephantiasis is a serious disease that destroys so deep sexuality and fertility. Reconstructive surgery is the only treatment that may correct the appearance but not a major effect on sexuality and fertility.

UP-090

Comparison of Apoptotic Gene Expression Profiles between Peyronie's Disease Plaque and Control Tunica Albuginea

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Introduction and Objectives: The fibrotic plaques of Peyronie's disease (PD) and other localized fibrotic conditions have been considered to be the result of an abnormal wound healing process. Potential pathogenetic role of disorders in the regulation of apoptosis in abnormal wound healing may also play a role in the development of Peyronie's disease. To examine the phenomenon of apoptosis in Peyronie's disease, we quantified differential levels of expression of Fas, Fas Ligand, Bcl–2, p53, Caspase 3 and 8 which have major roles in apoptosis, gene expressions in Peyronie's plaque and control tunica albuginea (TA).
Methods: Eight Patients with PD undergoing surgical correction of the curvature had biopsy specimens removed from the Peyronie's plaques and normal TA. Messenger RNA (mRNA) expression was assessed in

plaques and normal tunica by reverse transcriptase PCR. The levels of housekeeping gene "β2 microglobulin" were used as internal control for normalization of RNA quantity and quality differences in all samples.
Results: Apoptotic gene expressions were lower than housekeeping gene in half of the patients with normal TA and two thirds of the cases with plaques. The mRNA expressions in the plaque were not significantly different from the normal TA.
Conclusions: Lower expression of apoptotic gene relative to the housekeeping gene may cause the persistence of collagen producing cells, which were up-regulated due to unknown reasons and consequently plaque formation. Similar expression levels of apoptotic genes in both TA and Peyronie's plaques may be due to the generalized physiopathologic alterations in TA that lead to plaque formation at a vulnerable region subjected to recurrent traumas.

UP-091

Climacturia Post-prostatectomy Remains a Largely Unknown Clinical Entity in Contemporary Urologic Training Based on Results Obtained at a Resident Training Laboratory

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Introduction and Objectives: Mulhall et al have reported the incidence of climacturia (involuntary loss of urine during sexual activity) after radical prostatectomy approaches 20 percent of men. Cancer survivorship quality of life is negatively affected by climacturia, and the introduction of the male sling for incontinence may provide resolution of these symptoms, based on recent reports. Unfortunately, a significant proportion of urologists remain unaware of climacturia, thereby limiting potential benefit. We report on senior resident awareness of climacturia, institutional practices, and potential treatments.
Methods: Twenty–nine residents completed the 2010 prosthetics course and multipart climacturia questionnaire. These trainees represent a broad United States geographic distribution. The climacturia component consisted of 10 multipart questions (the majority Likert–scaled 1–10), addressing residency experience at respective institutions.
Results: The majority of residents were in the 4th year of residency. Climacturia was discussed with patients, prior to surgical treatment for localized CaP, in 5/29 cases. 14/29 respondents were aware of climacturia prior to the course, but pre–/post RP discussions with the patient did not address the involuntary loss of urine. Inconsistencies in rates were reported by those aware, ranging from 0 to 80 percent (cluster around 10%), as well as potential impact on patient QoL (Likert range 1–10, 80% report 7–10), time to resolution (range out to 36 months) and treatments available (Kegel, AUS, male sling, condom, Actis band, bulking agents).
Conclusions: Post–radical prostatectomy quality of life is meaningfully impacted by involuntary loss of urine during sexual activity. Contemporary residency programs do not consistently address climacturia as part of the postoperative side-effects secondary to RP; there is a need for awareness and education programs focused on trainees, as well as patients undergoing RP.

UP-092

Post-prostatectomy Penile Rehabilitation and Erectile Dysfunction Treatment: Senior Resident Perceptions and Institutional Practices Based on Results Obtained at a Resident Training Laboratory

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Introduction and Objectives: Mulhall et al recently published findings of US urological practice for post-radical prostatectomy recovery of erectile function (penile rehabilitation, PR). The Sexual Medicine Society of North America (SMSNA) provides a hands-on prosthetics training course as part of the annual fall meeting for senior residents; we present contemporary data for PR and treatment of post-prostatectomy erectile dysfunction (ED) in this cohort.
Methods: Twenty-nine residents completed the 2010 prosthetics course and multipart post-RP ED questionnaire, representing broad US geographic distribution. The penile post RP/ED component consisted of 20 questions (majority Likert-scaled 1–10), addressing different residency experiences.
Results: The majority of residents were in the 4th year of residency. ED was discussed with patients, prior to treatment for localized CaP, in all cases although this varied from a short, broad concept discussion to detailed post-RP choices and early initiation of treatment. Postoperative potency rates given to the patient before surgery were 50–100, 30–75, and 0–50 for bilateral, unilateral, and non–nerve sparing procedures, respectively. PDE5, intracorporeal injection, MUSE and vacuum erection device use varied, as did timing of initiation, and frequency of use. In most cases, a rehabilitation strategy (27/29 PDE5 based) is initiated within 1 week of catheter removal. Intra–institutional variabilities noted as well, which were surgeon or program dependent.
Conclusions: Post–radical prostatectomy PR remains controversial, as the optimal type of intervention, timing, duration, and functional outcomes vary across studies or are unknown. Concern is raised regarding the expectations for recovery, as communicated to the patient, which in many cases are quite higher than reported. Prospective practice–specific outcomes would allow for more accurate patient counseling and more realistic recovery expectations.

UP-093

Leadership in Canadian Urology: What Is the Right Stuff?

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Introduction and Objectives: There is little data characterizing leadership roles within Canadian Urology. The importance of these positions in Urology underscores the need for further investigation in order to provide insight for recruitment, development and success.
Methods: All Canadian Urology program directors and division/department heads were invited to complete an online leadership survey as part of a larger national cohort from 11 other surgical specialties.
Results: Response rate was 62%(13/21), the majority of whom were Caucasian (77%) and male (92%). Only 8% of respondents in Urology hold an advanced degree compared to 45% in other specialties. Additional leadership training was done by 54%. Residency was completed in Canada by 92%, but 62% completed fellowships abroad. A majority reported no well-defined job description for their role (54%). The top responsibility reported by leaders was mentoring residents (67%), followed by advising staff (62%). Excellence in patient care and teaching were seen as the most important professional characteristics, while integrity was the personal quality felt most important. Leaders reported 17% of their income came from their leadership role, equivalent to the time required for position duties (19%). "Time management" was listed as the greatest challenge faced (54%). Leadership style was reported as "democratic" by 92%. Leaders in urology most often self-rate their leadership skills lower than leaders from other surgical specialties (4 vs. 3/10).
Conclusions: Positions of leadership in Urology are disproportionately represented by Caucasian males and comparatively few hold relevant advanced degrees. Excellence in the areas of teaching and patient care, and high personal integrity are felt to be the most important characteristics for success. Time management issues are viewed as the greatest challenge. This preliminary data should prove useful for the mentoring, recruitment and success of future leaders in our specialty.

UP-094

What Is the Best Local Anesthesia during Extracorporeal Shockwave Lithotripsy? Prospective Randomized Clinical Study Comparing EMLA and Lidocaine

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Introduction and Objectives: Determine the best method of local anesthesia (EMLA versus Lidocaine) during extracorporeal shockwave lithotripsy (ESLW) procedure.
Methods: A prospective, randomized, single blind and crossover study was performed in 96 patients who were scheduled for ESWL for kidney or ureter stones over a period of six months (January-June 2010). Patients were divided into 3 groups, group 1 including 32 patients who received

EMLA (5%) at a dose 5 g, 15 minutes before the ESWL, group 2 including 32 patients who received 20 ml of Lidocaine (1%) injected subcutaneously at the target area and group 3, including 32 patients, who received placebo as a neutral gel applied in the same way as EMLA. Pain was measured by clinical parameters (blood pressure, heart rate, and vagal signs) and with 3 pain scales (visual analogical scale score (VAS), Verbal rating scale (VRS) and numeric rating scale (NRS)). Statistical analysis was performed with Chi 2, Student and Annova tests.
Results: The average age was 49 years. During the session of ESWL, there was an increase in systolic blood pressure and heart rate in the 3 study groups. The difference was statistically significant only for the vagal signs in the crossover studies EMLA / placebo and Lidocaine/EMLA. The analytical study confirms that the variation of the average value of the three pain scales during different times of the ESWL was statistically significant in the 3 groups. Four predictors of pain were found: the size of the stone (p=0.021), frequency (p=00.36) and wave intensity (0.036) shock and the duration of the session (0.036). The level of pain, in the three scales was less important for the Lidocaine group compared to placebo and the EMLA groups.
Conclusions: The ESWL is a painful procedure; the pain may influence the effectiveness of the act. The injection of Lidocaine during ESWL was the best method of local anesthesia compared to the EMLA cream and placebo.

UP-095

Trans-splenic Percutaneous Nephrolithotomy with Secondary Procedure via the Same Tract

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Introduction and Objectives: Splenic injury is a known complication of upper pole (UP) percutaneous nephrolithotomy (PNL). We describe a case of trans-splenic PNL followed by secondary PNL via the same tract.
Methods: A 62-year-old man presented with hematuria and bothersome lower urinary tract symptoms despite daily tamsulosin. Rectal exam was normal. A computed tomography (CT) scan revealed left hydronephrosis with a large stone burden (Fig. 1). The patient underwent holmium laser enucleation of the prostate (HoLEP) and left PNL.
Results: HoLEP was performed first. Operative time was 25 min and blood loss (EBL) was 5 cc. A 5Fr catheter was advanced into the left kidney and he was positioned prone. Access to the UP was obtained with an 18 gauge needle. The tract was balloon dilated and a 30Fr access sheath was seated. Stone removal was performed with rigid and flexible instruments. A 10Fr looped nephrostomy tube (NT) was placed. Fluoroscopic imaging did not reveal evidence of pleural effusion. PNL operative time was 227 min and EBL was 50cc. Non-contrast CT on postoperative day (POD) #1 revealed the percutaneous tract traversed the spleen (Fig. 2). No hematomas were identified. Several 2 – 3 mm stones remained. POD #1 Hb was 14.8 g/dL (preoperative 15.3). He remained stable and was taken for a secondary PNL on POD#2. The tract was re-dilated with a 26Fr rigid dilator and a 26Fr sheath was seated in the UP. All stones were extracted and a 10Fr NT was replaced. Operative time was 53 min and EBL was 10cc. POD#2 Hb was 14.9 g/dL. He was discharged on POD#3 with the NT in place. The NT was removed on POD #14.
Conclusions: In stable patients, post-PNL splenic injury can be managed conservatively. In select patients, secondary PNL via the tract may be feasible.

UP-096

Uric Acid Stone Prevalence Doubles in the Severely and Morbidly Obese (BMI>35) Compared to the Overweight (BMI 25-30)

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Introduction and Objectives: We sought to identify correlations between body mass index (BMI) and stone type, with particular emphasis on severe obesity (BMI >35) and morbid obesity (BMI >40).
Methods: Retrospective review of our institutional stone composition database was performed between March 2006 and Sept 2010 with IRB approval, and patients with BMI data were included. Patients were grouped by BMI: <25 (normal), 25-30 (overweight), 30-35 (obese), 35-40 (severely obese) & >40 (morbidly obese). Stone type was defined by the predominant stone component in each analysis (COM and COD were grouped as calcium oxalate; and brushite stones were grouped as calcium phosphate).
Results: Two hundred patients were included in the analysis. The distribution of patients and mean age (MA) were as follows: normal BMI (n=58, 29%; MA=43), overweight (n=35, 17.5%; MA=54.9), obese (n=47, 23.5%; MA=52.9), severely obese (n=38, 19%; MA=52.6) and morbidly obese (n=22, 11%; MA=48). The prevalence of UA stones increased in each successive BMI group; notably, the rates in the severely and morbidly obese groups were significantly higher than that in the normal group (p=0.03) and doubled in prevalence compared to the overweight.
Conclusions: The prevalence of UA stones was highest in the severely and morbidly obese. While obesity portends an increased risk for UA stones, our prevalence data indicates extreme obesity as problematic.

UP-097

Targeted Intervention versus Conservative Intervention for the Prevention of Kidney Stone Recurrence

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Introduction and Objectives: Conservative advice for stone prevention consists of increasing fluid intake, limiting protein, sodium and oxalate, and moderating calcium intake. Alternatively, performing two-24 hour urine tests can highlight specific metabolic abnormalities and targeted approaches such as selective dietary restriction, potassium citrate, or thiazide diuretics can be tailored accordingly. Conservative therapy is less costly, however it is not known if it is as effective as targeted therapy in preventing kidney stones, which we sought to determine with this study.
Methods: A retrospective chart review of patients from the Stone Centre at Vancouver General Hospital was performed of 98 patients with recurrent metabolic stone disease, consisting of 24-hour urine collections while on a random diet and again after dietary modification. Sex, age, body mass index (BMI), medical risk factors, anatomical risk factors, follow-up length, stone recurrences, and changes in volume, calcium, oxalate, citrate, sodium, and uric acid in the 24-hour urine samples were compared between targeted and conservative treatment groups.
Results: There was no difference observed in urinary oxalate, calcium, or citrate between groups. Urinary sodium (p=0.014) and uric acid (p<0.001) increased for the targeted metabolic management. In the obese population, there was a significant increase in the urinary sodium (p=0.003) and volume (p=0.034) for the targeted treatment group. There was no difference in stone recurrence rates between groups with a mean follow-up of 6.8 months (p=0.391).
Conclusions: From our results, both approaches in the management of patients at our centre did not affect stone recurrence rates. Urinary calcium levels did not increase despite increases in urinary sodium. Longer follow-up will determine which approach is more useful in stone prevention.

UP-098

Pulsed Fluoroscopy in Ureteroscopy and Percutaneous Nephrolithotomy

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Purpose: To assess the impact of pulsed fluoroscopy on the total fluoroscopy time during ureteroscopy (URS) and percutaneous nephrolithotomy (PCNL).
Introduction and Objectives: A retrospective review of prospectively collected data was performed for consecutive patients undergoing URS and PCNL by a single surgeon between July 2009 and July 2011. Pulsed Fluoroscopy (PF) at a rate of 4 frames per second (4 fps) was routinely used in all URS procedures since January 2011 and in all PCNL pro-

Table 1. UP-098. Patient, stone and operative characteristics in URS patients

Variable		Standard fluoroscopy (30 fps) (n= 117)	Pulsed fluoroscopy (4 fps) (n= 46)	*p* value
Gender (male)		78 (66.7%)	31 (67.4%)	0.93
Age (years) mean (95%CI)		53.2 (50.5-55.9)	54.2 (49.8-58.6)	0.70
BMI (kg/m2) mean (95%CI)		27.28 (18.95-39.65)	26.42 (21.95-33.84)	0.20
Laterality (Left)		61 (52.1%)	28 (60.9%)	0.32
Stone size (mm) mean (95%CI)		12.9 (11.1-14.7)	10.2 (8.7-11.6)	0.03
Stone location	Ureteral	56 (47.9%)	23 (50.0%)	0.74
	Renal	43 (36.7%)	13 (28.3%)	
	Both	18 (15.4%)	10 (21.7%)	
Multiple stones		40 (34.2%)	15 (32.6%)	0.85
Full/ partial staghorns		4 (3.4%)	1 (2.2%)	1.00
Radiolucent stones		15 (12.8%)	6 (13.0%)	1.00
Preoperative stents		70 (59.8%)	28 (60.9%)	0.90
Balloon dilations		9 (7.7%)	5 (10.9%)	0.54
Access sheath		61 (55%)	18 (40%)	0.11
URS type	Flexible	44 (39.6%)	10 (21.7%)	0.06
	Semi-rigid	29 (26.1%)	10 (21.7%)	
	Both	38 (34.2)	26 (56.5%)	
Mean OR/min (95%CI)		76.9 (70.8-83.0)	77.0 (66.9-87.0)	0.95
Residual stone		22 (18.8%)	9 (19.6%)	0.91
Mean fluoroscopy time /sec (95%CI)		109.1 (94.2-123.9)	44.1 (36.5- 51.6)	< 0.001

URS: ureteroscopy; BMI: body mass index; CI: confidence interval.

cedures since November 2010. Patients were divided into 2 groups for each procedure based on whether SF or PF was used. Patient and stone characteristics together with operative data were compared between both groups of each procedure using univariate and multivariate analyses to correct for patients, stone and surgical variables.

Results: A total of 163 URS (117 SF and 46 PF) and 100 PCNL (50 SF and 50 PF) were included. In the URS cohort, there were no significant differences between both SF and PF groups in terms of age, gender, BMI, stone location, and multiplicity (≤0.20). The SF group in the URS cohort had significantly larger stone size (12.9 vs. 10.2 mm; p=0.03), which lost its significance in the multivariate analysis. Duration of surgery and stone-free rates were also comparable in both groups of URS and PCNL (≤0.06). Compared to PF groups, patients in the SF groups were exposed to a mean of 65 and 220 seconds more fluoroscopy (109.1 vs. 44.1 sec, p<0.001) and (341.1 vs. 121.5 sec, p<0.001) in the URS and PCNL cohorts, respectively. These differences in mean fluoroscopy time retained their significance in the multivariate analyses (p<0.001). In the multivariate model, female gender, right-sided stones, increased number of punctures and postoperative stenting were significantly higher in the PF in PCNL group (Table 1, Table 2).

Conclusions: The use of pulsed fluoroscopy during URS and PCNL was associated with significantly lower fluoroscopy time thus, reducing radiation exposure.

UP-099

Laparoscopic Nephrectomy with Intact Specimen Extraction for Massive Polycystic Kidney Disease: Updated Technique and Outcome Analysis

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Introduction and Objectives: We present our technique of laparoscopic nephrectomy with intact specimen extraction for patients with massively enlarged autosomal-dominant polycystic kidney disease (ADPKD).

Methods: We reviewed all laparoscopic nephrectomies with intact specimen extraction done for ADPKD, in a university hospital between April 2004 and January 2011. We used three 10mm ports with additional one or two 5mm ports in our technique of transperitoneal laparoscopic nephrectomy.

Results: Total of 39 (L=14, R=25) laparoscopic nephrectomies were performed in 32 patients (M=21, F=11) with ADPKD. The indications were to create space for future renal transplant in 21 (54%), pain in 16 (41%), recurrent urosepsis in 2 (5%), bleeding requiring transfusions in 2 (5%) and renal tumor in one (2.5%) renal unit. Mean age and body mass index were 52.2 years (range 29-72 years) and 26.9 kg/m2 (range 21.6-34.0 kg/m2) respectively. Fourteen (36%) patients had previous abdominal surgeries and 26 (81%) patients were on dialysis. No patient had preoperative angioembolization of the renal unit. Mean preoperative hemoglobin and serum creatinine levels were 131.6g/L (range 107-171g/L) and 514µmol/L (range 84-923µmol/L) respectively. Mean operative time and estimated blood loss were 185 minutes (range 113–287 minutes) and 94mL (range 10–350mL) respectively. No patient required open conversion. Mean specimen size was 24.2cm (range 15–38cm), weight 1515g (range 412–4590g) and length of extraction incision was 9.2cm (range 6–13cm). There was one (2.5%) intraoperative and three (7.5%) postoperative complications. There were no deaths. Mean length of hospital stay was 5 days (range 3-12 days).

Conclusions: Our technique of transperitoneal laparoscopic nephrectomy for patients with ADPKD is safe and offers all the advantages of minimally invasive surgery such as reduced blood loss, shorter incision, excellent cosmesis and faster recovery.

Table 2. UP-098. Patient, stone and operative characteristics in PCNL patients

Variable		Standard fluoroscopy (30 fps) (n= 50)	Pulsed fluoroscopy (4 fps) (n= 50)	*p* value
Gender (male)		36 (72%)	23 (46%)	0.01
Age (years) mean (95% CI)		53.7 (49.4-59.6)	55.7(49.6-59.6)	0.53
BMI (kg/m2) mean (95% CI)		26.4 (24.2- 28.6)	27.5 (18.9- 53.4)	0.36
Laterality (Left)		39 (78%)	20 (40%)	<0.001
Stone size (mm) mean (95%CI)		31.8 (26.7- 42.5)	33.2 (29.8-39.4)	0.70
Stone location	Ureteral	0	2 (4%)	
	Renal	39 (78%)	33 (66%)	0.67
	Both	11 (22%)	15 (30%)	
Multiplicity of stones	Single	16 (32%)	8 (16%)	
	Multiple	18 (36%)	26 (52%)	0.29
	Stag/partial	16 (32%)	16 (32%)	
Radiolucent stones		9 (20%)	9 (20%)	1.00
HF units (95%CI)		776.4 (674.3- 878.6)	874.5 (779.6- 969.5)	0.90
PCNL position	Prone	47 (94%)	46 (92)	1.00
	Supine	3 (6%)	4 (8%)	
Number of punctures	None	11 (22%)	6 (12%)	0.02
	One puncture	22 (44%)	10 (20%)	
	≥2 punctures	17 (34%)	34 (68%)	
Number of tracts	Used previous	10 (20%)	6 (12%)	0.08
	One tract	35 (70%)	32 (64%)	
	2 tracts	5 (10%)	12 (24%)	
Tract location*				
	Upper pole	5 (12.5%)	17 (38.6%)	
	Mid pole	15 (37.5%)	14 (31.8%)	0.018
	Lower pole	25 (62.5%)	25 (56.8%)	
Postoperative antegrade stenting		39 (78%)	49 (98%)	0.004
Mean OR/min (95%CI)		94.7 (81-101)	100.4 (88- 111)	0.15
Stone free		47 (94%)	47 (94%)	1.00
Mean fluoroscopy time/sec (95%CI)		341.1 (271.6- 393.6)	121.5 (108.3- 144.2)	< 0.001

*The pre-formed tracts in both groups were excluded from the analysis. URS: ureteroscopy; BMI: body mass index; CI: confidence interval; PCNL: percutaneous nephrolithotomy.

UP-100

Urologists in Cyberspace: Evaluating Quality of American Urologists' Websites on the Internet

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Introduction and Objectives: With increased access to the Internet, society is increasingly seeking health information online. Urologists use websites to facilitate information dissemination but also to promote their own services. In this study, we use a validated tool, the Health on the Net Foundation code of conduct (HONcode), to evaluate a selection of websites from urologists' based in the United States of America (USA).

Methods: The 10 most populous cities in America were identified from the US Census Bureau. Using the Internet search engine, www.google.com, we searched "urologist + city" and identified the top ten hits for each city. Each website was scored using the HONcode (15 points). The median score was used to dichotomize the cohort and multivariable logistic regression used to identify independent predictors of higher scores.

Results: Of the total 78 websites analyzed, there were 18 academic institutions, 43 group and 17 solo practices. A medical website design service had been used by 18 websites. The HONcode badge was seen on 3 websites (4%). The median HON code score was 5.5 (range 1-10). Multivariable logistic regression showed academic centre was a predictor of high HON score (OR 7.7, CI 1.5-39.8, p=0.014) and use of medical website design service associated with lower HON score (OR 0.08, CI 0.18-0.33, p=0.001).

Conclusions: Using a validated tool for appraising online health information, we found a wide variation in quality of urologists' websites in America. Better awareness of available services and standards, and guidance from governing bodies would improve quality of websites and the overall credeibility of urology as a specialty.

UP-101

Robotic-assisted Microsurgery: the Initial 603 Case Experience

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Introduction and Objectives: Since the introduction of the operating microscope in 1975, microsurgeons continue their quest for better outcomes and improved operative ease. Use of the daVinci Si system (Intuitive Surgical Inc., Sunnyvale, CA) for microsurgery may provide advantages in terms of offering magnification, motion scaling and additional surgical arms in a stable ergonomic platform. This study presents our 603 case experience of robotic assisted microsurgery by a single fellowship-trained microsurgeon (Jul'07 - Jan'12).

Methods: Cases included: 65 robotic vasovasostomy (RAVV), 42 robotic vasoepididymostomy (RAVE), 354 robotic microsurgical denervation of the spermatic cord (RMDSC) for chronic orchialgia, 2 robotic testicular artery micro-anastomosis (injured during RMDSC), 128 robotic subinguinal varicocelectomies, 10 robotic micro-dissection testicular sperm extractions and 2 robotic microsurgical nerve grafting during robotic prostatectomy. The 4-arm Si robotic system was utilized with high definition magnification (10-15x), micro robotic instruments, and a new micro robotic Doppler probe.
Results: All cases were completed successfully without a trained microsurgical assistant. The fourth arm improved surgeon efficiency (extra microsurgical instrument handled simultaneously). Previously, the microsurgeon could perform only two standard microsurgical procedures a day due to fatigue limitations using the standard microscope. With the aid of dual robotic systems, the same microsurgeon has been able to routinely perform up to 10 microsurgical procedures a day due to the ergonomic advantages of the robot.
Conclusions: Robotic assisted microsurgery is in its infancy. However, with technical advances, a number of microsurgical procedures can be successfully performed with improved efficiency.

UP-102

Assessment of the Understanding of Androgen Deprivation Therapy (ADT) Associated Side Effects in Primary Care Physicians

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Introduction and Objectives: Androgen Deprivation Therapy (ADT) is a common treatment for men with prostate cancer, but has a number of toxicities. In this study, we assessed the knowledge of primary care physicians (PCPs) regarding ADT associated side effects and their interest in increasing knowledge in this area.
Methods: We obtained a list of active PCPs across Canada using the Canadian Medical Directory and distributed a cross-sectional survey to 600 randomly selected physicians. The survey collected basic demographic information, whether they had patients on ADT in their practice, their knowledge level of ADT side effects, and their interest in educational resources/opportunities to improve their knowledge base.
Results: Seventy-one completed questionnaires were returned; 52 respondents provided family medicine care to adults. Sixty-five percent of respondents were male, with a median age between 51-60 years old (range <30 to >60 years old) and median number of years in practice between 21-30 years (range <10 to >30 years). Most physicians (86.5%) had patients on ADT for prostate cancer in their practice. Forty percent felt their knowledge of ADT side effects was inadequate and 50% felt uncomfortable counseling patients on this topic. The majority (74.5%) reported that they rarely or never discuss ADT toxicities with patients. Eighty-five percent of PCPs wanted additional educational resources on ADT. With regards to avenues of information on ADT, physicians in our study expressed an interest in continued medical education (CME) events (46.2%), educational pamphlets (32.7%) and specialist consultations (26.9%).
Conclusions: While ADT use is commonly seen in primary care practice, many PCPs feel that they have limited knowledge on how to counsel patients with ADT-associated side effects. There is a strong interest to learn about ADT side effects through CME events and educational pamphlets.

UP-103

Senior Resident Perceptions of Industry Interaction with Prosthetic Urologists Based on Results Obtained at a Resident Training Laboratory

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Introduction and Objectives: There is little in the urologic literature that provides information on the interactions between trainees and company representatives from the urologic prosthetics industry.
Methods: Twenty-nine residents completed the 1010 prosthetics course and multipart industry interaction questionnaire. These trainees represent a broad United State geographic distribution.
Results: The residents were asked questions focused on several aspects of industry-resident interaction as it pertains to GU prosthetics. Specific areas of interest were access to the resident at their training institution (>80%), whether this was limited to OR exposure (approximately half), the utility of these industry contacts (bias towards company products vs. educational prosthetic messaging) as it relates to male slings, AUS and penile prostheses (19/29 scored the maximum 10), as well as perception of ethics and potential for bias. The majority of respondents are of the opinion that these interactions can be done in an ethical manner. Access post-training for company representatives to office (23/29) and OR (25/29) were also addressed.
Conclusions: There have been several recent publications that have called to question the utility of industry-surgeon interaction, and the potential for negative impact on patient care. These results suggest that residents perceive benefit through these relationships with minimal ethical concerns, if care is taken to minimize promotional aspects and focus on improving health care delivery to patients through surgeon and patient education in its many forms.

UP-104

Factors Affecting Surgical Performance and Operating Room Safety in Urology: a Preliminary Evaluation

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Introduction and Objectives: Surgical outcomes depend not only on patient & disease factors but the skill of the surgical team. A survey was conducted to evaluate various factors in the OR environment that impact an individual surgeon's "performance".
Methods: An internet-based survey was distributed to 2057 urologists regarding factors that potentially impact surgical outcomes by serving as surgical distractors; surgeon-specific (internal), environmental (external), and interprofessional (interactive).
Results: 324 urologists (16%) completed the survey; 70% were N. American, 43% were from academic institutions and 68% had completed a clinical fellowship. The majority of urologists reported having operated when sleep deprived (80%), when significantly ill (86%), with a MSK injury (57%), or under significant social stress (67%). While up to 37% reported such internal distractors had significantly affected technical performance (e.g. slower OR times), only 23%, 45%, 42%, and 32% of these urologists had ever cancelled an OR day due to fatigue, illness, MSK injury or social stressor, respectively. When in the OR, music was played routinely by 56% of urologists and 70% reported answering pages and discussing consults. 25% reported working "commonly" with scrub nurses that were unfamiliar with the procedure or instruments, only 43% had a consistent OR assistant, and 64% reported that the scrub nurse would "commonly" or "sometimes" scrub out during a critical portion of the surgery. Overall, 82% felt the OR environment required changes to improve safety and 13% reported that a complication had occurred mainly due to such external distractors. Urologists working at hospitals where a routine preoperative "time-out" was performed reported fewer complications relating to external distractors.

Conclusions: Various factors may significantly affect technical performance and the OR environment in urology, promoting undesirable patient outcomes. Such factors must be considered in order to optimize patient care

UP-105

The Management of Post-transplant Lymphoceles: Changes in Practice at l'Hôtel-Dieu de Québec

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Introduction and Objectives: Lymphocele is a common complication following kidney transplantation. In our experience, lymphocele management has dramatically evolved overtime toward a less invasive approach. The purpose of this study is to review efficacy and complications associated with their treatment.

Methods: Between January 1990 and December 2010, 962 kidney transplantations have been performed in our institution. 152 recipients (15.8%) developed a lymphocele postoperatively. Characteristics of recipients and donors, peritransplant details, long-term function and survivals were retrospectively collected. Descriptive analysis of patients who developed a posttransplant lymphocele has been performed to assess efficacy/complications of different management options.

Results: From the 152 patients presenting a post-transplant lymphocele, 78% required an active treatment. Aspiration was the most frequently used (52%) but was associated with a low success rate (15%). Indwelling drainage improved the success rates up to 34% but was associated with higher risk for infectious complications (14%). At first, internal marsupialisation of the lymphocele was the operation of choice for refractory lymphoceles and was necessary for 44% of our symptomatic patients with a 50% success rate and a 17% complication incidence. Later, sclerotherapy with proviodine was used in 35% of our cohort with a high success rate of 97% and a complication rate of 5%.

Conclusions: In our experience, posttransplant lymphocele management has evolved toward a minimally invasive approach with proviodine sclerotherapy. This treatment strategy has been associated with a high success rate and low incidence of complications. Consequently, we think this strategy should be favored in the treatment of symptomatic lymphoceles.

UP-106

Factors Associated with an Increased Risk of Delayed Graft Function in Donation after Cardiac Death Kidneys

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Introduction and Objectives: The purpose of this study was to review the experience of our donation after cardiac death (DCD) kidney program to determine factors that may be associated with an increased risk of delayed graft function (DGF).

Methods: We retrospectively analyzed the charts of all 63 patients receiving single-kidney-only transplant of a DCD kidney since our DCD programs inception in 2006. DGF was seen in 41 of 63 patients (65%) and there were no cases of primary non-function.

Results: Indications for dialysis had some overlap and included fluid overload (18/41), hyperkalemia (10/41), and no indication recorded or simply uremia in 17/41. Patients with DGF were noted to have received donor organs with significantly longer time with systolic blood pressure (SBP) <55 mmHg (28.2 min vs. 21.1 min, p=0.049) and a trend toward a longer time to asystole (29.3 min vs. 16.6 min, p=0.063). Only 2 of 13 grafts (15.4%) showing satisfactory early function had SBP <55 mmHg for more than 30 minutes, compared to 20 out of 50 (40%) if the time was under 30 minutes, although the difference was not statistically significant. Machine cold perfusion (n=36) of the donor organs did not significantly improve the rate of DGF, however, it was associated with improved creatinine clearance on days 3 (12.6 vs. 7.8 mL/min, p=0.036) and 7 (20.0 vs. 8.7 mL/min, p=0.003) and patients receiving DCD kidneys that had been machine perfused were discharged sooner (16 vs. 11.5 days, p=0.006).

Conclusions: Our results are comparable to those seen at other institutions. DCD kidneys from donors having a SBP <55 for more than 30 minutes are very unlikely to show early graft function. Machine cold perfusion seems to improve kidney function in the early post-transplant period in these DCD kidneys but does not mitigate the risk of DGF.

UP-107

Debilitating Lower Urinary Tract Symptoms in the Post-renal Transplant Population Can Be Predicted Pre-transplantation

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Introduction and Objectives: Overactive bladder (OAB) and benign prostatic hyperplasia (BPH) are common entities in the aging population, which may be masked by the low urine output of end-stage renal disease (ESRD). Sequelae of these disease processes may pose an underlying risk to renal allografts from episodes of retention and infections. Our objective was to determine the frequency and severity of LUTS in renal TX recipients and to determine if validated questionnaires could predict which patients will develop severe LUTS after TX.

Methods: All adult renal-TX recipients at our institution from 2005 to 2010 were invited to participate in this study via mailed questionnaires. The Overactive Bladder Questionnaire (OAB-Q) and International Prostate Symptom Score sheet (IPSS) were completed based on three time points: pre-TX, and 6 and 12 months post-TX. Overall scores were tabulated based on the returned surveys.

Results: Of 465 patients who underwent renal TX, 105 participated in the study (22.6%). LUTS were common pre-TX (15% on OAB-Q) and post-TX (31% and 23% at 6 and 12 months respectively). Health-related quality of life (HRQL) scores pre-TX were predictive of moderate to severe symptoms post-TX with an odds ratio of 11.2 (95%CI 2.7-45.9, p=0.0012) at 6 months and 9.2 (95%CI 2.0–41.8, p=0.0085) at 12 months. In male patients the IPSS found 40.8% of men had moderate to severe BPH symptoms pre-TX. When their post-TX symptoms were examined these patients were 9.4 times as likely to suffer moderate to severe symptoms as compared to patients with low IPSS scores at 12 months (95% CI 1.7-51.9, p=0.0086).

Conclusions: The use of validated LUTS questionnaires prior to renal TX predict which patients will suffer significant LUTS post-TX. Identification of patients at risk for LUTS could allow for screening of inappropriate TX candidates, and treatment of urologic symptoms avoiding complications, which could compromise renal allografts.

UP-108

Thymoglobulin Differentially Increases CDR Naive T-cell Proliferation Following Renal Transplantation

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Introduction and Objectives: The risk of acute T-cell mediated rejection remains an obstacle in kidney transplantation despite aggressive immunosuppressive therapy with T-cell depleting agents such as Thymoglobulin (ATG). The etiology behind this rejection is not well understood and may be rooted in a disturbance in the balance between the reconstituting naïve, memory and regulatory T-cell phenotypes. This study evaluated the effects of ATG on various CD4 and CD8 T-cell subsets at an early period following renal transplantation.

Methods: Kidney transplant recipients were allocated into receiving Simulect (Control, n=9) or ATG (n=12) based upon their immunological risk. Blood samples were obtained before and at various time intervals for

1 month after transplantation and stained using cell surface and intracellular markers and analyzed using flow cytometry.
Results: Early time points demonstrated that ATG readily depletes CD4 and CD8 T-cell populations ($p<0.05$). CD4 memory T-cells were depleted in the ATG group on day 2 ($p<0.05$), with CD4 memory effector and central T-cells depleted by Day 7 ($p<0.05$). Although no overall difference in the CD4 naïve T-cell population, the CD4 naïve effector T-cell population was depleted on day 7 and 14 in the ATG group ($p<0.05$) while CD4 naïve central T-cells were depleted by day 2 ($p<0.05$). CD8 memory and naive T-cells continued to be depleted on day 28 ($p<0.05$). With respect to proliferation rates, ATG treated patients had increased turnover of memory T-cells on day 14 ($p<0.05$) and particularly memory T-effector cells on day 2 ($p<0.05$). CD4 naive and CD4 regulatory T-cell populations also had increased rates of proliferation on day 2 in the ATG group which were greater than seen in the CD4 memory population ($p<0.05$).
Conclusions: This is the first study to provide novel information on the early proliferation of T-cells following ATG in kidney transplant recipients and may offer insight into future maintenance immunotherapy.

UP-109
Retubularization of the Ileocystoplasty Pouch for Conversion into an Ileal Conduit Diversion
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Introduction and Objectives: We present the outcomes and long-term follow-up of patients who failed initial ileocystoplasty and subsequently underwent conversion to an ileal conduit urinary diversion utilizing the retubularized pouch from the initial bladder augmentation.
Methods: The charts of all patients who underwent this surgery at our centre were reviewed. The indications for surgery, work-up, clinical outcomes, and complication rates were assessed. Patient reported symptom response based on global response assessment (GRA) was determined and used as a subjective method to assess overall treatment effectiveness.
Results: Twelve patients with either interstitial cystitis/bladder pain syndrome (10) or neurogenic bladder (2) were followed for a mean of 71 months. The most common indication for surgical conversion was ongoing severe lower urinary tract symptoms or bladder pain despite several prior therapies. Operative and early complications were uncommon; however, late complications were more frequent, the most common being urinary tract infections (4) and parastomal hernias (5). Based on GRA responses, 40% of patients reported subjective clinical improvement, while the remaining 60% had either worse or unchanged symptoms.
Conclusions: Our experience with this surgical method demonstrates similar objective outcomes as previous studies [1, 2], but also shows that less than half of patients are satisfied with their postoperative symptom response. This finding may reflect the general difficulty in symptom control in a subset of an already challenging patient population and may be confounded by other factors perceived by the patient as bothersome such as postoperative complications. Nevertheless, retubularizing the ileocystoplasty pouch for creation of an ileal conduit offers several therapeutic advantages over creation of a de novo conduit and should be considered as a viable treatment option in this patient population when other less-invasive therapies have failed.

UP-110
Conservative Management of High Post-void Residual Urine in Asymptomatic Men: Retrospective Analysis of Outcomes
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Introduction and Objectives: Elevated post-void residual (PVR) volume (greater than 150 ml) may occur in symptomatic men with conditions such as benign prostatic hypertrophy, bladder neck contracture, urethral stricture, and neurogenic bladder. Although the prevalence is unknown, there exists a population of men with asymptomatic, elevated PVR. The aim of this study was to examine clinical outcomes of conservative management in a cohort of patients with asymptomatic, elevated PVR.
Methods: This study included men with PVR greater than 150ml as measured by ultrasound. Imaging was performed to rule out hydronephrosis. Treatment was instituted if symptoms and/or hydronephrosis were present. Patients without symptoms or hydronephrosis were managed with watchful waiting in the office setting by a single urologist (RBB). Retrospective chart review was done to examine the incidence of febrile urinary tract infections (UTI), worsening renal function, and need for surgical intervention.
Results: Out of 74 patients with asymptomatic, elevated PVR at initial presentation, 17 (23%) become subsequently symptomatic and required surgical intervention. The remaining 57 patients were managed with watchful waiting for median duration of 7 years (1.4-10.3 years). Median PVR in this study population was 287ml (151-967 ml). Out of this cohort, only two patients (3.5%) developed febrile UTI and renal insufficiency.
Conclusions: Patients with asymptomatic high PVR can be safely managed conservatively over long-term with watchful waiting.

UP-111
No Show Rates for Follow-up after Visual Internal Urethrotomy: a Single Surgeon Experience
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Introduction and Objectives: Visual Internal Urethrotomy (VIU) is the most commonly performed intervention for urethral stricture disease. Although VIU has had excellent outcomes with success rates ranging from 50% to 85%, longer follow-up studies have shown poorer success rates ranging from 6% to 28%. Follow-up at 6 months is typically conducted to assess for recurrence as this may indicate the need for a second VIU (1), a decision to move towards urethral reconstruction, or even observation. However, treatment for stricture disease is often hampered by poor patient follow-up. This study aims to assess the percentage of no-show rates post VIU and the potential implicating factors.
Methods: A chart review using the Electronic Medical Record (Wolf), as well as hospital database was assessed. Of 75 patients who had undergone VIU since 2006, 62 met our inclusion criteria. Netcare was also checked to ensure the patient did not go elsewhere for follow-up such as urgent dilation, cystoscopy or VIU.
Results: A total of 76 VIUs were performed on 63 patients. 59 patients were male and 4 were female. Of the male patients, 71% had bulbar urethral strictures whereas 29% had urethral strictures. 15 patients required greater than 1 VIU and 5 patients went on to urethral reconstruction. A large percentage of patients (19%) failed to attend their scheduled follow-up appointment. The median age of patients failing to attend appointments was 36.5 as opposed to 48 for those who attended.
Conclusions: Patients that received VIUs were half as likely to attend their follow-up appointments than patients attending regular urology cystoscopy practice (19% vs. 9% no show, respectively). All patients that did not attend their follow-up appointments were male, and 20% of those patients required more than one VIU. Improvement of urinary symptoms may influence follow-up rates as they may feel they no longer require medical follow-up. Patient age and contact availability may also be implicated (2).

UP-112
Genitourinary Tuberculosis or Not Genitourinary Tuberculosis: Case Series and Critical Look at the Challenging Diagnosis of Genitourinary Tuberculosis
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Introduction and Objectives: Genitourinary (GU) tuberculosis (TB) can present with a wide variety of symptoms and has no single unifying pathopneumonic presentation. Despite treatment protocols and criteria for high-risk individuals, the number of reported cases of tuberculosis in Canada has been relatively stable over the past 10 years. Approximately 40% of the cases are in Ontario and 3.5% of all presentations involve

the GU system. We aim to review the presentations of GU TB in Canada then consider the diagnostic challenges posed by it.
Methods: We reviewed the medical records and imaging of all cases of GU TB treated in London over the past 8 years. The radiologic and clinical findings for each patient was assessed to reflect the ways in which TB can present in the GU system including a critical look at the diagnostic tools available and their shortcomings.
Results: There were 4 females and 1 male, with an age range at presentation from 45-80 years. Presented are 2 TB kidney, 1 primary bladder who presented with gross hematuria, 1 with ureteric stricture disease and 1 with a testicular mass. All of these cases were confirmed with acid fast bacilli stains on tissue or urine specimens. None of the patients had a personal history of known TB. However, all had radiologic findings consistent with TB on retrospective review. Four of the 5 patients were not born in Canada but all had negative screening chest x-rays and TB skin testing at immigration was self reported as negative.
Conclusions: It is conceivable that these patients did not acquire TB in Canada and tests used for TB screening at immigration may be inaccurate. A comparison of the sensitivity and specificity of urine studies, tissue studies, radiologic findings and the use of more accurate testing such as urine PCR studies, showed that GU TB remains a diagnostic dilemma. Although a rare diagnosis, it is not one which should be forgotten in our differential, as it is neither historic nor declining in its rates of presentation.

UP-113

Common Urological Presentations of the Penitentiary Population in Kingston: a Chart Review

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Introduction and Objectives: Kingston, Ontario provides for approximately 20% of incarcerated offenders under custody of Correctional Service of Canada (CSC). Therefore, health care institutions in Kingston play a crucial role in providing health care to this unique population. However, there has been a paucity of reports on the penitentiary population with urologic complaints. In this study, we investigated urologic presentations of inmate patients at Kingston General Hospital (KGH).
Methods: A retrospective chart review of 188 consecutive incarcerated patients was performed, accounting for all KGH Urology visits by inmates in the past 5 years. All patients were under custody of CSC at the time of their first visit. Patient charts were assessed to determine age, gender, presenting signs and symptoms, diagnoses, and treatments provided. The demographic and diagnostic distributions were analyzed; the pattern of presenting signs and symptoms was also investigated.
Results: All 188 inmates were males between the age of 25 and 87 at the time of the study. The most common age group to present with urologic complaints was between the ages of 50 and 59. The most prevalent signs and symptoms included lower urinary tract symptoms (27.7%) and hematuria (19.1%), followed by renal colic (5.3%) and symptoms of neurogenic bladder (2.7%). Out of 188 patients, 117 (62.2%) received a definitive diagnosis. Common diagnoses included nephrolithiasis/ureterolithiasis (11.2%), benign prostatic hyperplasia (8.0%), and hydrocele (6.9%), followed by epididymo-orchitis (4.3%), prostate cancer (4.3%), hydronephrosis (3.2%), phimosis/paraphimosis (2.7%) and urethral stricture (2.7%).
Conclusions: In this study, we aimed to outline the nature of urologic presentations in the Canadian penitentiary population. As a subsequent step, we will compare the presenting urological problems of the inmate population to the general population, and identify potential barriers for care or access.

UP-114

Targeted Robotic-assisted Microsurgical Denervation of the Spermatic Cord for Chronic Orchialgia

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Introduction and Objectives: Previous groups have shown microsurgical denervation of the spermatic cord (MDSC) as a possible treatment option for chronic orchialgia. Pathology and anatomical studies have identified specific nerve bundles within the spermatic cord that may be responsible for chronic pain in these men. This study presents outcomes for a robotic assisted targeted MDSC approach utilizing a mapped nerve protocol to maximize preservation of vessels and lymphatics.
Methods: This study was a prospective outcomes research study with the primary endpoints of elimination in pain impacting quality of life (assessed utilizing a standardized validated pain assessment tool: PIQ-6 (QualityMetric Inc., Lincoln, RI), operative duration, hydrocele formation and testicular atrophy. Analysis of 348 MDSC cases from October 2008-December 2011 was performed (median follow-up 19 months: 1 to 38). Selection criteria: chronic testicular pain (>3 months), failed all other standard pain management treatments and negative urologic workup. Pain scores and physical exam were performed preoperatively and then postoperatively at 1, 3, 6, 9 &12 months.
Results: 85% (297/348) of the patients had a significant decrease in their pain (defined as pain having no impact on quality of life questionnaire – score of ≤50 or a greater than 50% reduction in pain) by 6 months postoperatively. The procedure failed to provide pain relief in 51 patients. Median operative duration was 15 min (10-150). Complications were: 1 testicular ischemia, 9 hematomas, 2 seromas. There were two testicular arteries and one vasal injury; these were repaired intra-operatively with robotic assisted microsurgical techniques without any further sequel.
Conclusions: Targeted robotic assisted MDSC is feasible and the preliminary results appear promising. Further follow-up and further evaluation is warranted. The four arm robotic approach allows the microsurgeon to maneuver multiple instruments simultaneously.

UP-115

Should Large Adrenal Myelolipomas (>6cm) Be Removed? Case Series and Review of Literature

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Introduction and Objectives: Adrenal myelolipomas (ML) are rare, nonfunctional, benign neoplasms composed of adipose cells and hematopoietic elements. With the widespread use of abdominal imaging, more frequent discovery of these quiescent adrenal masses occurs. While management of small, asymptomatic adrenal ML is well described, the management of large (>6 cm), incidental adrenal ML remains controversial. Most advocate surgical resection given the concern of life-threatening, spontaneous, retroperitoneal hemorrhage. The literature was reviewed to evaluate current management of incidental adrenal ML larger than 6 cm. We present four cases of large adrenal ML (7 to 10 cm) encountered at our institution, laparoscopically excised without complications. Indications for resection included concerns regarding malignant potential. Pathology confirmed the diagnosis of adrenal ML with no concomitant malignancy in each case.
Methods: A comprehensive review of the literature was performed by two independent searchers, using both PubMed and MEDLINE databases with the key words adrenal and myelolipoma.
Results: More than 300 abstracts were reviewed, 117 of which were assessed in detail. Salient clinical and pathologic characteristics, in addition to criteria for definitive radiological diagnosis and the role of fine needle aspiration biopsy for diagnostic confirmation are described.
Conclusions: Large, asymptomatic adrenal ML diagnosed definitively with imaging can be managed conservatively. No malignant potential for adrenal ML has been recorded. Similarly, our clinical experience with laparoscopic adrenalectomy for large adrenal ML confirms no evidence of malignancy for masses greater than 6cm. When clinical features and imaging are indicative of adrenal ML, a surgical approach is not warranted merely on account of size. The literature indicates an absence of a correlation between ML size and risk of hemorrhage. No mortalities have been reported secondary to ruptured adrenal ML.

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