Unmoderated Poster Session: Miscellaneous Topics
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UP001

Influence of pH on the Cytotoxic Activity of Inositol Hexakisphosphate (IP6) on a Hormone Refractory Prostate Cancer Cell Line

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Introduction and Objective: Inositol hexakisphosphate (IP6) is a naturally occurring phytochemical abundant in soy, cereals and legumes. We have shown that IP6 may be a promising anti-cancer agent in prostate cancer (PCa). Definite mechanisms remain to be established as IP6 potentially acts by targeting several signaling pathways, as well as to cause cell cycle arrest and to induce cell death. When the IP6 salt is reconstituted in water, the solution has a pH of 12, which is not apt for consumption. The pH must thus be adjusted to 7 prior to use. Our objective was to evaluate to biological activities of IP6 at various pH levels.

Methods: The hormone-refractory PC3 cell line was stimulated for up to 72 hours with IP6 at pH 5, pH 7 and pH 12. Several parameters, such as metabolic activity (WST1), cell cycle progression (FACS), cell proliferation (cell counting) were measured to evaluate IP6 effects. The phosphorylation status of several proteins documented to be activated following IP6 stimulation was evaluated by Western Blot. All experiments were compared to water at pH 5, 7 and 12, which had no effect on the various biological activities monitored.

Results: At the three pH studied, IP6 induced a significant reduction in the metabolic activity and cellular proliferation of PC3 cells. Following a 24 hr stimulation with 5 mM of IP6, the IP6 at pH 12 reduced the metabolic rate by 89,3 % and IP6 at pH 5 by 78,9%, compared to only 39,6% with the IP6 at pH 7. As for cellular proliferation, following a 72 hr stimulation, IP6 at pH 12 significantly reduced cell number compared to controls by 60.4 % ($p = 0.014$, T-test) (46.9% for pH 5 and 46.6% at pH 7). There was no evidence of cell cycle arrest at the three pH studied, however a sub-G1 peak was observed only with IP6 at pH 12. Finally, only IP6 at pH 12 induced significant reduction in phospho-AKT, phospho-PDK1 as well as PARP expression following a treatment at pH 12.

Conclusions: We are the first group to report on the effect of pH on the biological activity of IP6. Our results demonstrate that pH modulation has a significant effect on the activity of this phytochemical agent.

UP002

Androgen-Regulated Expression of Arginase 1 and Arginase 2 in Human Prostate Cancer

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Introduction and Objectives: The significant immunological boost following androgen depletion therapy (ADT) illustrates the immunosuppressive potential of androgens in prostate cancer (PCa). Since the expression of arginases appears to be one of the mechanisms involved in this immunosuppression, it is of interest to determine whether androgens regulate their expression. Our objectives are to evaluate the *in vitro* and *in vivo* expression of arginase in PCa cell lines and primary tumours.

Methods: The expression of the two isoforms of arginase (ARG1 and ARG2) was evaluated *in vitro* using LNCaP cells stimulated with 10 nM of R1881. *In vivo* expression was evaluated by immunohistochemistry using tissue micro-arrays (TMAs) containing samples from 224 patients. The TMAs included prostate tissues that was normal, non-malignant adjacent to tumour, PIN, hormone sensitive and hormone refractory. One TMA also contained samples from 36 patients treated with ADT prior to surgery. Arginase activity was quantified using an enzymatic assay and HPLC measurements of L-arginine concentration. Cytokine production was determined by ELISA.

Results: LNCaP cells expressed the highest levels of ARG2, whereas no ARG2 expression was detected in Du145 or PC3 cells. ARG1 expression was present in LNCaP, Du145 and PC3 cells. Androgen stimulation led to an overexpression of ARG1 and ARG2 in LNCaP cells. This overexpression was accompanied by an increase in arginase activity and L-arginine metabolism. *In vivo*, ADT exposed patients expressed less ARG2 than control patients ($p < 0.001$, T-test). The androgen-stimulated expression of ARG1 and ARG2 was independent of AR expression (siRNA studies) and AR activity (bicalutamide treatment). IL-8, also overexpressed by androgens in LNCaP cells, was able to induce the expression of ARG1 and ARG2 independently of androgens.

Conclusions: Our results demonstrate that the presence of androgens favors the expression of ARG1 and ARG2 both *in vitro* and *in vivo*. Our data supports the notion that the regulation of arginase expression may be independent of the androgen receptor and be partly regulated by IL-8. Further work is ongoing to characterize the immunosuppressive microenvironment in PCa in order to improve the efficacy of immunotherapy.

UP003

Capsaicin and Lycopene Reduce Proliferation and Induce Apoptosis in Prostate Cancer Cells via A TRPV1 and TRPV6 Mediated Phenomenon

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Introduction and Objective: Prostate cancer (PCa) is the most common internal malignancy and the second most frequent cause of cancer death in Canadian men. Capsaicin, the active compound in chilli peppers has been recently investigated for its protective effects on PCa. Well-established as a pain reliever, capsaicin acts mainly on the transient receptor potential vanilloid (TRPV)-1 and the TRPV6 receptor. These receptors are expressed in PCa cells and can facilitate the inflow of intracellular calcium. Lycopene is an antioxidant found in tomatoes intensely investigated in PCa research. Although the chemopreventive effects of lycopene as a single agent remains controversial, combination studies support its protective properties. Our present study aims to investigate the chemopreventive effect of capsaicin in combination with lycopene. We have found that treating PCa cells with capsaicin and lycopene alone and combined, reduces proliferation and induces apoptosis. Mechanistic studies examining this relationship have not been well established. We hypothesize that capsaicin and lycopene in combination reduce proliferation and induce apoptosis via the TRPV6 and TRPV1 receptor in PCa cells *in vitro*.

Methods: Two human PCa cell lines (PC3 and LNCaP) were analyzed. Cells were incubated for 72 hours with capsaicin alone or combined with lycopene. Using the MTS assay proliferation was measured. LNCaP cells were treated with capsaicin and lycopene and alterations in the expression of TRPV6, TRPV1, androgen receptor (AR), PSA, cell-regulatory molecules and apoptotic markers were assessed by Western Blot analysis.
Results: A significant decrease in proliferation was observed in LNCaP and PC3 cells treated with capsaicin alone ($P < 0.05$) and combined with lycopene ($p < 0.001$). Western blot analysis revealed a reduction in AR and PSA expression and an up-regulation of *p*27 and cleaved PARP, indicating cell-cycle arrest and apoptosis. Correspondingly, an increase in TRPV6 and TRPV1 expression was found in cells treated with capsaicin and lycopene. A plausible mechanism of action for this combination of dietary agents is currently being investigated.
Conclusions: We have shown for the first time that the TRPV6 and TRPV1 receptors may play an important role in capsaicin and lycopene mediated cell-cycle arrest and apoptosis in human PCa cells. These studies may eventually help identify patients likely to benefit from the use of capsaicin in combination with lycopene. Understanding the mechanism of these dietary agents may help improve strategies for PCa patients reducing morbidities associated with conventional therapies.

UP004

Prostate Cancer Xenograft Growth is Inhibited by IKKe Knock-Down

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Introduction and Objective: Inflammation is part of the host response to stress induced by internal or external environmental stimuli. When inflammation becomes recurrent or chronic, it may contribute to the development of human cancers. Inflammation is controlled by the release of various mediators of the immune response. Elevated inflammatory cytokine levels in serum, such as interleukin (IL)-6, have been associated with metastasis-related morbidity in prostate cancer (PCa) patients. We were the first to publish that high IKKe expression results in its nuclear translocation and an increase of IL-6 promoter stimulation. These novel observations suggest that IKKe nuclear translocation leads to the nuclear activation of several transcription factors that control inflammatory cytokine gene expression, particularly IL-6 which could act as a growth factor for PCa cells.
Methods: We developed a sub-cutaneous xenograft PCa models able to control inducible IKKe expression. This model makes use of the doxycycline- (dox-) inducible PC-3-6TR-shIKKe cells, as well as shLacZ-inducible controls. The cells are mixed with matrigel prior to injection into the flank of SCID mice to limit their spread and to allow the formation of better defined tumours. Dox is delivered through dox-supplemented food (625 mg/kg) to minimize mouse stress. Mice were sacrificed when the tumour volume reached 2,500 mm^3 according to the CIPA recommendations.
Results: We performed a large-scale experiment (48 mice) to study the effect of IKKe depletion on PC-3-6TR-shIKKe cell proliferation *in vivo*. No dehydratation or weight loss was observed in control or IKKe-depleted mice fed with the dox-supplemented diet. We observed an important decrease of the PC-3-6TR-shIKKe xenograft proliferation in SCID mice fed with the dox-supplemented diet. Moreover, PC-3-6TR-shIKKe mice fed with normal diet and all PC-3-6TR-shLacZ control mice reached the predefined tumour volume more than 20 days before PC-3-6TR-shIKKe mice fed with dox-diet.
Conclusion: These results provide solid evidences for a role of IKKe in PCa cell proliferation and survival. We believe that a better understanding of IKKe involvement in PCa may advance our understanding of PCa progression and lead to novel therapeutics options.

UP005

Down-Regulation of Type I Interferon Receptor In Bladder Cancer Cells may Account for INF Refractory and Susceptibility to Vesicular Stomatitis Virus

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Introduction and Objective: The intrinsic oncolytic specificity of vesicular stomatitis virus (VSV) is currently being exploited to develop alternative therapeutic strategies for bladder cancer and other cancers. Previously, we reported that oncolytic VSV are potent agents for intravesical treatment of high risk bladder cancer. VSV preferentially targeted bladder cancer cells resistant to type I interferon (IFN) treatment. The goal of the current study was to further elucidate the nature of the molecular defect of IFN signaling by which bladder cancer cells become susceptible to VSV infection.
Methods: Using a tissue microarray (TMA) composed of human bladder cancer cores, the expressions of IFN pathway-related proteins were examined. The expression of type I IFN receptor (IFNAR) were evaluated in superficial (RT4 and RT112) and invasive bladder cancer cell lines (KU7-luc and UMUC3), and then the association of IFNAR expression levels with the susceptibility to IFN treatment or VSV-induced cell lysis were analyzed. To confirm the hypothesis that down-regulation of IFNAR in bladder cancer cells may be a molecular mechanism responsible for resistance to type I IFN treatment and sensitivity to VSV oncolysis, the effect of siRNA knockdown of IFNAR or blocking IFNAR with a neutralizing antibody in RT4 or KU7-luc cells was evaluated.
Results: The results of TMA showed that the expression of IFNAR was decreased relative to normal bladder tissue. Advanced bladder cancers had even lower expression of IFNAR compared to superficial bladder cancers. Further, invasive bladder cancer cells susceptible to VSV-induced lysis (KU7-luc and UMUC3) had lower expression of IFNAR than resistant superficial cell lines (RT4 and RT112). SiRNA knockdown of IFNAR indeed facilitated replication of VSV in cells previously resistant to VSV treatment and promote VSV-induced cell lysis in those cell lines. Blocking IFNAR with a neutralizing antibody showed a similar effect.
Conclusions: Down-regulation of IFNAR in bladder cancer may be one of the primary molecular mechanisms for clinical IFN resistance. However, this also facilitates VSV replication and oncolysis in high risk bladder cancers and provides a basis for selecting bladder cancer patients for oncolytic VSV therapy in future clinical trials.

UP006

Nitric Oxide Signalling Mediates Hypoxic Up-Regulation of Macrophage Inhibitory Factor in Prostate Cancer

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Introduction and Objectives: Macrophage inhibitory factor (MIF) is an important chemokine influencing progression of prostate cancer. We have demonstrated that tumour hypoxia mediates many factors leading to a malignant phenotype in prostate cancer, including invasion, metastases and drug-resistance. Such hypoxia-induced phenotypes can be attenuated by manipulating nitric oxide (NO) signaling through classic, cGMP mediated pathways. The aim of this study was to determine the role of NO signalling in hypoxia-induced upregulation of MIF in prostate carcinoma cells.
Methods: MIF production by DU-145 prostate cancer cells (as well as the MDA breast cancer cell line) was determined by ELISA in different oxygen culture conditions (0.5–20% O_2). The role of NO signalling in hypoxia-mediated upregulation of MIF was determined by pharmacologic inhibitors and mimics of classic NO signalling with 10 nM GTN, 100 M L-NMMA as well as non-hydrolysable analogue of cGMP, 8-bromo-cGMP (10 nM).
Results: These studies demonstrate that exposure of DU145 (as well as the MDA cell lines) to low oxygen tension for 24 hours consistently increased the secretion of MIF into the supernatant (1720 ± 245 ng/mL

vs. 240 ± 46 ng/ml, $p < 0.05$). Incubation of the cell lines with the inhibitor of nitric oxide synthase L-NMMA in 20% oxygen resulted in a similar increase in MIF secretion (832 ± 66 ng/ml vs. 220 ± 33 ng/ml, $p < 0.029$). Restoring classical NO signalling in these cells with low concentrations of GTN or 8-bromo-cGMP was also able to significantly ($p < 0.05$) reverse the hypoxia-mediated increase in MIF.
Conclusions: These results contribute to our understanding of MIF regulation, an important chemokine linked to cancer progression in numerous cancer sites. It appears that decreased NO signalling, as a result of microenvironmental hypoxia, is at least partially responsible for increased MIF secretion by cancer cells. These results justify further *in vivo* investigations of the role of nitric oxide signalling and MIF action and may represent a novel target for pharmacologic therapy for prostate cancer.

UP007

In vitro Investigations on Function and Differentiation of Tissue-Engineered Human Urothelium with Regard to Legal Regulations

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Introduction and Objective: Engineered autologous urothelium (EAU) might be a treatment option for reconstructive urology. Clinical application requires compliance with legal regulations for media used for human urothelial cell (HUC) culture. The commonly used supplements cholera-toxin (CT), bovine pituitary extract (BPE), and fetal bovine serum (FBS) are not legally allowed. Native urothelium is a tight epithelium. The transepithelial resistance (TER) can therefore be used as indicator of epithelial differentiation and function *in vitro*. High TER is only reached in the presence of FBS. Aim of the study was to establish a cell culture medium for EAU suitable for an intended clinical application.introductory sentence or two indicating the objective of the study and its purpose.
Methods: Tested cell culture media were DMEM, DMEM/F12 (1:1), keratinocyte medium (KM) supplemented with CT, BPE, and human recombinant epidermal growth factor. TER measurements were performed in HUC cultures of 6 different cell lines at day 2, 7, and 9 after induction of stratification in the presence of 5% FBS. The expression of adherens junction protein E-Cadherin, tight junction protein ZO-1, and differentiation marker CK20 were analyzed immunologically.
Results: In general, high variations between the TER in different HUC lines were observed. When DMEM and DMEM/F12 (1:1) were used as stratifying cell culture medium the mean values in the TER measurements revealed 3 to 4.5 times higher compared to the cultures when KM was used. The TER values within the DMEM group and the KM group were comparable. At day 2, 7, and 9 the DMEM group revealed mean values (Ohm·cm^2) of 193 (±87), 2674 (±1977) and 3,638 (±3118), respectively. In contrast, the KM group showed 65 (±20), 847 (±1592) and 1,067 (±1304), respectively. TER reached higher levels in KM when CT and BPE were omitted. Stratifying HUCs cultured in DMEM-based medium revealed a higher CK20 expression and a homogenous distribution pattern of ZO-1 compared to a reduced CK20 expression and inhomogenous distribution pattern of ZO-1 in the KM group. E-Cadherin distribution was consistent in all groups.
Conclusions: TER, regarded as a sign for epithelial integrity, gives good evidence of tissue differentiation and function of bioartificial urothelial transplants when ZO-1 is homogenously distributed and TER is above 1000 Ohm·cm^2. Furthermore, TER is an appropriate parameter for investigations on legally conform cell culture media for EAU. As the chemically defined DMEM and DMEM/F12 demonstrated better TER compared to KM, still FBS has to be substituted for legal conformance.

UP008

Beta-Catenin Target Genes are Upregulated During Partial Bladder Outlet Obstruction and Inhibited by Rapamycin

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Introduction and Objectives: Bladder outlet obstruction (BOO) leads to overgrowth and remodeling of the detrusor. Strain, hypoxic injury and diabetic bladder models induce MMP7 expression which correlates with proliferation in many cell types. Regulation of MMP7 and FGF9 occurs in part through beta-catenin, GSK3-beta and mTOR, the mammalian target of rapamycin. Our purpose is to investigate the expression of beta-catenin target genes, MMP7 and FGF9, and their mTOR dependence during *in vivo* and *in vitro* bladder strain and hypoxia.
Methods: Sprague-Dawley rat bladders were partially (BOO) or sham (SHAM) obstructed for six-weeks (n = 4,3 respectively). *In vitro*, bladder smooth muscle cells (BSMC) were elongated 5% by slow ramping of static strain to mimic bladder distention in vivo. A humidified chamber was used at 1% or 3% O_2 with 5% CO_2 to simulate tissue hypoxia. BSMC were pretreated with rapamycin (10 ng/ml) at T = -1 hour. Real time PCR of MMP7 and other beta-catenin targets was performed on cDNA from *in vivo* and *in vitro* models by normalizing to gapdh or rpl32. Other MMPs (2,7,9,13) were examined by semi-quantitative PCR. Westerns for active beta-catenin were performed on the *in vivo* samples.
Results: Of the MMP studied, MMP7 was significantly upregulated, 58-fold, during partial BOO ($p < 0.05$). FGF9 was increased 3-fold ($p < 0.05$). Other targets of beta-catenin (CCND1, EPHB3) showed increasing trends during BOO. Active beta-catenin showed a trend towards increasing, two-fold in BOO vs. SHAM bladders. *In vivo*, 5% stretch plus 1%O_2 hypoxia increased MMP-7 expression, which was inhibited significantly by rapamycin ($p < 0.05$).
Conclusions: Transcriptional upregulation of beta-catenin target genes MMP-7 and FGF-9 implicates a role for this pathway during *in vivo* obstruction. Similar results *in vitro* suggest that application of stretch plus hypoxia mimics *in vivo* models. The ability of rapamycin to inhibit beta-catenin targeted growth-related genes provides another mechanism for the inhibition of growth of smooth muscle cells by this clinically approved drug.

UP009

Schedule-Specific Efficacy of Combined PPARγ-Agonists with EGFR Inhibtion is Achieved via Induction of PPARγ Expression

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Introduction and Objective: The two signaling molecules that are extremely attractive for targeted therapy are the epidermal growth factor receptor (EGFR) and the peroxisome proliferator-activated receptor γ (PPARγ). We evaluate the integration of combined drugs against these targets in the management of bladder cancer therapy.
Methods: The effect of EGFR inhibitor (Gefitinib) and PPARγ-agonist C-DIM, on cell growth, were screened in a panel of 9 human urothelial carcinoma cell lines derived from well-differentiated superficial bladder tumours as well as from high-grade invasive tumours. Cell proliferation was determined with an MTT assay after incubation with varying concentrations of the targeted agents (10^{-3} to 10^2 μM) for 72 hrs. Antiproliferative effects of combined therapy (Gefitinib and C-DIM) compared to each drug alone were monitored *in vitro*, by MTT assays, and *in vivo,* in nude mice inoculated with the more resistant cell lines (KU-7 and UM-UC13). Levels of expression of EGFR and PPARγ were evaluated by Western Blot analysis at baseline and after pre-treatment with EGFR inhibitor (Gefitinib). Immunofluorescence was then used to determine PPARγ nuclear accumulation mediated by Gefitinib. RT-PCR analysis was done to investigate expression of transcription factors involved in PPARγ induction
Results: Gefitinib and C-DIM inhibit growth of bladder cancer cell lines in a dose-dependent manner but with variable sensitivity. Induction of PPARγ expression was observed in response to different concentrations of Gefitinib for 24 h. Moreover, induction of PPARγ expression and nuclear accumulation was observed following EGFR inhibition through the transcription factor CCAT/enhancer-binding protein-β (CEBP- β). MTT assay shows that maximum inhibition of cell proliferation was observed when cells were pre-treated with Gefitinib for 24 h followed by C-DIM as compared to C-DIM followed by Gefitinib or each treatment alone. Tumour weight from mice treated with combined therapy was significantly lower than each treatment alone compared to control ($p < 0.02$).

Conclusions: Preliminary results suggest that PPARγ-agonist C-DIM can render bladder tumour sensitive to EGFR inhibition and combination efficacy might be achieved in a schedule-specific manner.

UP010

Randomized Control Trial of Transurethral Resection of the Prostate after Intraprostatic Injection of Local Anesthetic with Epinephrine: Interim Analysis

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Introduction and Objective: Epinephrine is used to reduce surgical bleeding and improve visualization in various otolaryngological and neurosurgical operations. Transurethral resection of the prostate (TURP) remains the gold standard therapy for obstructive benign prostatic hyperplasia; however, visualization can be impaired by bleeding during the procedure. As a result, we investigate the use of intraprostatic epinephrine injection prior to TURP to reduce peri- and intraoperative bleeding.

Methods: Patients were randomized to receive either 20 cc of transurethrally injected intra-prostatic 1% lidocaine with 1:200,000 epinephrine or saline, in a double blind fashion. TURP followed immediately, using the modified Nesbit technique. Total blood loss, number of arteries requiring spot coagulation, resection time, visibility and safety parameters were recorded. All surgeries were performed by three urologists in a teaching environment. A priori total sample size was calculated to be 30 patients.

Results: Fifteen (of a pre-planned sample size of 30) patients were randomized to either treatment group A (n = 8) or treatment group B (n = 7). The groups were similar with regards to age, BMI, prostate volume, indication for treatment and preoperative 5-alpha-reductase inhibitor and alpha-blocker usage. Mean blood loss was greater for treatment group A (44.9 ± 35.8 g) than for treatment group B (28.4 ± 19.8), albeit not significant, $p = 0.33$. The mean number of arteries requiring focal coagulation was not significantly different, at 8.5 (SD 3.7) for treatment group A and 8.0 (SD 3.2) for treatment group B, $p = 0.786$. There were no differences in mean resection time between treatment groups A (40.9 ± 14.1 min) and B (40.3 ± 17.4 min), $p = 0.943$ nor in the quality of visibility during resection ($p = 0.322$). Complications were rare, with no significant differences in cardiac arrhythmias nor changes in blood pressure in either treatment group, $p = 0.876$.

Conclusions: This is the first randomized clinical trial investigating the use of intraprostatic epinephrine pre-TURP. There is a trend to decreased blood loss for treatment group B, suggesting an emerging difference between treatment arms. This lack of statistical significance is likely an issue of power and sample size, which should be rectified at the final analysis.

UP011

Salvage Prostate Cancer Treatment: Comparison of Morbidity between Cryotherapy and High Intensity Focused Ultrasound

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Introduction and Objectives: Treatment of radio-recurrent current prostate cancer with curative intent is associated with significant morbidity. High intensity focused ultrasound (HIFU) is a relatively new treatment option that allows prostate ablation with minimal side effects in the primary setting, yet its morbidity in a salvage setting has never been compared to that of other minimally invasive treatments. We wished to examine whether salvage HIFU resulted in fewer complications than salvage cryotherapy (CRYO) in a single unit, single surgeon comparison.

Methods: Three cohorts of 47 patients were taken for this study. The first cohort consisted of the first 47 patients treated at our institution with CRYO to the prostate gland for radio-recurrent prostate cancer (1995–1998).The second cohort were the last 47 patients treated with CRYO between 2002 and 2004 (after 140 case had been performed) and our third cohort was the first 47 patients treated with salvage HIFU (2006–2009). Preoperative and postoperative morbidity data was recorded prospectively and compared for variations in morbidity.

Results: Salvage HIFU treatment had lower rates of mild/moderate incontinence and urinary retention as well as lower rates of perineal pain. HIFU was associated with a similar rate of worsening of lower urinary tract symptoms (LUTS) and gross haematuria when compared with our initial experience with CRYO. With experience, LUTS reduced following CRYO. Recto-Urethral fistula rates low at 2%, 2% and 4% respectively. Results are summarized in Table 1.

Table 1. UP011. Morbidity outcomes between three groups

	HIFU (n = 47)	Cryotherapy group 1 1995–1998 (n = 47)		Cryotherapy group 2 2002–2004 (n = 47)	
Patient age	68	67	$p > 0.05$	71.5	$p > 0.05$
Pre-salvage PSA	3.2	9.6	$p < 0.001$*	3.4	$p > 0.05$*
Mild/moderate incontinence	2 (4.3%)	23(49%)	$p < 0.001$	14 (30%)	$p < 0.001$
Severe incontinence	0 (0%)	0 (0%)	$p > 0.05$	1 (2.1%)	$p > 0.05$
Perineal pain	3 (6.4%)	10 (21%)	$p > 0.05$	7 (15%)	$p > 0.05$
Fistula	2 (4.3%)	1 (2.1%)	$p > 0.05$	1 (2.1%)	$p > 0.05$
Urinary retention	3 (6.4%)	15(32%)	$p < 0.001$	9 (19%)	$p < 0.05$
Gross hematuria	7 (15%)	6 (13%)	$p > 0.05$	3 (6.4%)	$p < 0.05$
Urethral sloughing	0 (0%)	2 (4.3%)	$p > 0.05$	6 (13%)	$p < 0.05$
Bladder neck contracture	0 (0%)	5 (11%)	$p < 0.05$	1 (2.1%)	$p > 0.05$
Urinary tract infection	4 (8.6%)	5 (11%)	$p > 0.05$	2 (4.3%)	$p > 0.05$
Worsening LUTS	22 (47%)	24 (51%)	$p > 0.05$*	13 (28%)	$p < 0.05$*

HIFU = High intensity focused ultrasound; PSA = prostate-specific antigen; LUTS = lower urinary tract symptoms; * = Statistical significance between cryotherapy groups.

Conclusions: Salvage HIFU was associated with lower rates of incontinence, perineal pain and bladder neck contracture than Salvage CRYO. Complication rates reduced with experience with CRYO with worsening LUTS being statistically significant; however, HIFU still compares favorably to even our most experienced CRYO results. This study confirms that salvage HIFU is a feasible salvage procedure with acceptable morbidity rates at least equivalent to salvage CRYO.

UP012

Clinical Outcomes of Secondary or Tertiary Treatment of Benign Prostatic Hyperplasia (BPH) with GreenLight HPS™ Laser Photoselective Vaporization Prostatectomy (PVP)

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Introduction and Objective: Secondary procedure rates of surgical therapy for BPH range between 1 and 14%. We evaluate GreenLight HPS™ laser PVP as a treatment for symptomatic BPH previously treated with surgical management.

Methods: We prospectively evaluated our initial GreenLight HPS™ laser PVP experience. Only patients who failed prior surgical therapy (transurethral prostate resection (TURP), transurethral microwave therapy (TUMT), holmium laser ablation of prostate (HoLAP) and potassium-titanyl-phosphate (KTP) laser PVP) for symptomatic BPH were included. Transurethral PVP was performed using a GreenLight HPS™ side-firing laser system.
Results: Prior surgical management included TURP (18), TUMT (9), KTP laser PVP (8), HoLAP (2), TUMT and TURP (1), and TUMT and KTP laser PVP (1) in 39 of 181 consecutive patients. Mean prostate volume was 80.8 ± 50.0 mL. Mean laser and operative times and energy usage were 12.5 ± 10.5 minutes, 30.0 ± 24.0 minutes and 83.2 ± 64.4 kJ, respectively. Five patients developed a urinary tract infection. There were 36 patients who had nonsignificant hematuria for less than one week. Three patients had persistent urinary retention requiring clean intermittent catheterization. No urethral strictures or urinary incontinence were noted. All patients were able to discontinue their prostate medications following surgery. Mean American Urological Symptom Association Score (AUASS) decreased significantly from 22.8 to 8.2, 6.5, 6.5, 5.5, 4.6, 3.6 and 4.6 ($p < 0.05$) at 1 and 4 weeks and 3, 6, 12, 18 and 24 months, respectively. Mean maximum flow rate (Qmax) and post void residual (PVR) measurements also showed significant improvement from baseline. The incidence of adverse events were low.
Conclusions: Our initial results demonstrate that GreenLight HPS™ laser PVP is safe and effective for the treatment of symptomatic BPH recurring following prior surgical management.

Table 1. UP012

	Pre Op	1 wk	4 wk	3 mo	6 mo	12 mo	18 mo	24 mo
Mean AUASS	22.8 ± 5.9	8.2 ± 5.1*	6.5 ± 3.6*	6.5 ± 5.3*	5.5 ± 2.5*	4.6 ± 2.7*	3.6 ± 2.0*	4.6 ± 2.7*
Mean QoL score	4.7 ± 1.1	1.4 ± 1.4*	1.0 ± 1.3*	0.9 ± 1.1*	0.8 ± 0.8*	0.6 ± 0.6*	0.3 ± 0.5*	0.7 ± 0.7*
Mean Qmax (mL/sec)	9.9 ± 4.0	18.4 ± 7.4*	20.6 ± 9.2*	20.9 ± 7.1*	19.7 ± 9.4*	20.8 ± 7.6*	23.2 ± 12.5*	18.3 ± 3.0*
Mean PVR (mL)	74.6 ± 94.3	47.7 ± 94.3*	47.6 ± 85.6*	41.5 ± 61.5*	42.7 ± 44.9*	39.0 ± 42.3*	38.3 ± 42.0*	41.0 ± 35.8*
N	39	39	35	32	26	22	14	9

*$p < 0.05$

UP013

Does Prostate Configuration Affect the Efficacy and Safety of GreenLight HPS™ Laser Photoselective Vaporization Prostatectomy (PVP)?

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Introduction and Objective: We evaluate the efficacy and safety of GreenLight HPS™ laser PVP for the treatment of lower urinary tract symptoms (LUTS) secondary to benign prostatic hyperplasia (BPH) with bilobe and trilobe prostates.
Methods: We prospectively evaluated our GreenLight HPS™ laser PVP experience. Based on the results of cystoscopy and transrectal ultrasonography, patients were stratified into two groups: bilobe (group I) and trilobe (group II) BPH. Transurethral PVP was performed using a 120W GreenLight HPS™ side-firing laser system. American Urological Association Symptom Score (AUASS), Quality of Life (QoL) score, maximum flow rate (Qmax) and post void residual (PVR) were measured preoperatively and at 1 and 4 weeks and 3, 6, 12, 18 and 24 months postoperatively.
Results: There were 181 consecutive patients identified (I: 101, II: 80). Among the preoperative parameters, there were significant differences in prostate volume (I: 46.5 ± 17.9, II: 97.5 ± 120.2 mL, $p < 0.001$.), Qmax (I: 10.1 ± 4.2, II: 8.7 ± 3.5 mL/sec, $p = 0.027$) and PVR (I: 60.4 ± 118.8, II: 97.5 ± 154.3 mL, $p = 0.074$), while AUASS (I: 22.7 ± 6.0, II: 23.0 ± 6.4, $p = 0.695$) and QoL (I: 4.7 ± 1.0, II: 4.5 ± 1.1, $p = 0.088$) were similar. Significant differences in laser utilization (I: 8.9 ± 4.5 II: 19.5 ± 11.7 minutes, $p < 0.001$) and energy usage (I: 59.1 ± 30.0, II: 131.2 ± 79.6 kJ, $p < 0.001$) were noted. Clinical outcomes (AUASS, QoL, Qmax and PVR) were significantly improved post surgery within each group. AUASS, QoL and Qmax showed immediate and stable improvement during the follow-up period. There were no significant differences in the postoperative clinical outcome parameters between the two groups ($p > 0.05$). The incidences of adverse events were low in both groups.
Conclusions: Our experience suggests that BPH configuration has little effect on the efficacy and safety of GreenLight HPS™ laser PVP.

UP014

Is The Efficiency of GreenLight HPS™ Laser Photoselective Vaporization Prostatectomy (PVP) Affected by Long-Term 5alpha-Reductase Inhibition (5ARI) Therapy?

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Introduction and Objective: Hemoglobin is the primary chromophore of the potassium-titanyl phosphate (KTP) laser. It is postulated that the efficiency of the GreenLight HPS™ laser PVP in patients on long-term 5ARI, which reduce angiogenesis in benign prostatic tissue, may be decreased. We evaluate GreenLight HPS™ laser PVP as treatment for benign prostatic hyperplasia (BPH) in patients on long-term 5ARI.
Methods: We prospectively evaluated our initial GreenLight HPS™ laser PVP experience in patients with (5ARI+) and without (5ARI-) long-term 5ARI. Transurethral PVP was performed using a GreenLight HPS™ side-firing laser system with normal saline irrigant. Voiding trials were performed two hours post surgery. American Urological Association Symptom Score (AUASS), Quality of Life (QoL) score, maximum flow rate (Qmax) and post void residual (PVR) were measured preoperatively and at 1 and 4 weeks and 3, 26, 12, 18 and 24 months post surgery. Serum PSA and TRUS were also obtained at the 12 week follow-up interval.
Results: There were 181 consecutive patients identified; 57 in 5ARI+ were on either finasteride or dutasteride and 124 in 5ARI- were not. Mean prostate volumes were 67.1 ± 35.3 and 69.2 ± 41.9 mL ($p = 0.646$) and mean PSA values were 2.2 ± 2.4 and 2.7 ± 2.6 ng/mL ($p = 0.289$), respectively. There were no significant differences in the parameters of laser utilization (13.6 ± 9.2 vs. 13.4 ± 10.4 minutes, $p = 0.965$) and energy usage (87.1 ± 62.4 vs. 91.8 ± 69.6 kJ, $p = 0.623$). All were outpatient procedures with the majority of the patients catheter-free at discharge. All patients were able to discontinue their prostate medications following surgery. The mean rates of prostate vaporization (2.7 ± 1.3 vs. 3.6 ± 2.4 mL/min, $p = 0.08$; 0.61 ± 0.81 vs. 0.53 ± 0.36 mL/kJ, $p = 0.47$) and TRUS volume 12 weeks post surgery (34.5 ± 27.1 vs. 36.8 ± 21.3 mL, $p = 0.665$) were similar between the two groups. Compared to baseline, PVR values decreased significantly in the 5ARI+ group ($p < 0.05$) but not in 5ARI- group. AUASS, QoL and Qmax values showed immediate and significant improvement from baseline ($p < 0.05$). AUASS, QoL, Qmax and PVR values at every time point showed no significant difference ($p > 0.05$) between the two groups during the follow-up interval. The incidence of adverse events was low and similar between both groups.
Conclusions: Our findings suggest that 5ARI do not have a detrimental effect on the efficiency and efficacy of GreenLight HPS™ laser PVP.

UP015

Duplicate Publications: A Survey of Redundancy in the Urological Literature

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Introduction and Objective: A redundant publication occurs when the same author or group of authors publishes a partial or complete duplicate of the scientific data from an existing manuscript. The steady push for academic and career advancement within the medical community can lead to a culture of "publish or perish". Unfortunately this may result in redundant publications that erode the value and quality of academic literature. Our objective was to sample the extent and features of redundancy within the urological literature.

Methods: A review of all original index articles published in the Journal of Urology in 2006 was conducted using the PUBMED search engine. Editorials, reviews, urological surveys, and letters to the editor were excluded. Suspected redundant publications were identified by combining the last names of the first, second and last authors with the key words provided by the original article. Search results were limited to 2004 -2008. Two senior investigators, each blind to the other, reviewed the suspected redundant publications and classified them as duplicate (identical materials, methods, results and conclusions), probable duplicate (almost identical materials, methods, results and conclusions), and salami-slicing (portions of index article repeated or continued). Discrepant classifications were resolved by mutual review and consensus.

Results: From a total of 723 original index articles, 28 were identified to have 31 suspected redundant publications. Review of full text versions of the suspected redundant publications resulted in one (0.1%) article being classified as a complete duplicate, 6 (0.8%) articles as probable duplicates, and 5 (.7%) articles as salami-sliced. Therefore 12/723 (1.7%) of index articles were found to have some form of redundancy. The proportion of redundant articles published prior to, and following their index article was 7/12 (58.3%) and 4/12 (33.3%), respectively. One redundant article (8.3%) was published in the same month as its index article.

Conclusion: The detection of redundant publications is a difficult and laborious process for peer reviewers and editors. This sampling of the Journal of Urology suggests that the duplication rate in the field of urology is small but significant and appears to be similar to other surgical subspecialties. Further assessment of other Urological journals is warranted.

UP016

Early Ambulation Following Robot-Assisted Laparoscopic Radical Prostatectomy (RALP): Is Pharmacologic Thromboembolic Prophylaxis Necessary?

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Introduction and Objective: Inactivity is associated with increased morbidity and coagulopathy after major surgery. After radical prostatectomy, ambulation typically commences the morning of postoperative day (POD) 1. Some centres employ routine pharmacologic deep venous thrombosis (DVT) and pulmonary embolism (PE) prophylaxis, often starting therapy prior to intubation. We review our initial RALP experience in which patients routinely ambulate hours after surgery, focusing on how our patients fare with respect to the incidence of DVT and PE.

Methods: Consecutive patients undergoing transperitoneal RALP by a single surgeon (CW) were prospectively evaluated. Preoperative ted stockings and sequential compression devices (SCD) were provided in the ambulatory surgery unit. Following RALP and transfer from the post-surgical recovery room to a regular surgical ward, patients were instructed to ambulate with assistance twice before bedtime the day of surgery. Normal ambulation without assistance resumed POD 1. Pharmacologic anti-thrombotic therapy was not administered routinely before, during or after surgery unless requested by a consulting physician. Rates of common complications associated with immobility were examined.

Results: There were 161 patients identified, having a mean age of 62.0 ± 8.1 years, an ASA of 2.2 ± 0.5 and 28.3 ± 3.9 kg/m^2. The mean operating room time was 213.0 ± 54.0 minutes and mean hospitalization was 1.2 ± 1.0 days. The median urethral catheter duration was 5.0 ± 3.9 days. Adverse events included 1 fascial dehiscence, 2 (0.6%) DVT and 0 (0.0%) with PE. Anti-platelet therapy was withheld 10 days prior to surgery in one of the DVT patients.

Conclusions: Routine pharmacologic therapy to prevent perioperative thromboembolic events adds to hospitalization costs at a minimum. These results suggest that prophylactic pharmacologic intervention may not be required for DVT and PE prophylaxis when ted stockings, SCDs and early ambulation are employed.

UP017

Clinical Experience Using *in vivo* Prostate Spectroscopic Imaging Technique at Short Echo Times

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Introduction and Objective: Magnetic resonance spectroscopic imaging (MRSI) is now widely used as a tool for mapping key biomarkers in the prostate. In this work we present a novel MRSI technique, which identifies short echo time metabolites and improves the clinical usability of MRSI.

Methods: Subjects with prostate cancer were scanned on a GE 1.5T MR scanner using a standard endorectal coil in combination with a torso phased-array coil. MRSI data was obtained using a newly optimized pulse sequence (CV-MRSI) in addition to a set of T2-weighted fast spin echo (FSE) images. MRSI scans at long (130 ms) and short (40 ms) echo times (TE) were acquired using the standard, and novel technique. Each 3D MRSI acquisition used a 16x8x8 phase encode matrix, with a voxel size of 0.42 cm^3. Preoperative biopsy was done using transrectal ultrasound. Following radical prostatectomy, the prostate was prepared for histopathological analysis. Spectra from voxels corresponding to malignant and normal tissue were analyzed using a modified version of LCModel.

Results: A continuous improvement in data collection was observed when obtaining data from consecutive acquisitions. The spectra and LCModel fits obtained from the same voxels from long and short TE acquisitions. Comparing the spectra obtained at TE = 130 ms to that obtained at TE = 40 ms, we are observing on average 60% reduction in contaminating lipids, and significant improvement in the signal to noise ratio (SNR). As well, the citrate multiplet structure is clearly resolved. In addition we are also detecting several other short TE metabolites, such as taurine (Ta), inositol (In), and glutamate/glutamine (Glx) previously not observed.

Conclusion: MRSI can help decrease problems seen with conventional prostatic biopsy, such as sampling error. In this study, we have shown the efficacy of using a conformal voxel technique for the detection of short TE metabolites, while improving the SNR. This has enhanced the diagnostic quality of spectra throughout the prostate and improved the clinical role of spectroscopic imaging data, which is supported by post-prostatectomy histopathology.

UP018

Burkholderia Cepacia Infection of the Prostate Caused by Inoculation of Contaminated Ultrasound Gel During Trans-Rectal Biopsy of the Prostate

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Introduction and Objectives: Ultrasound procedures and transmission gel have been implicated in the spread of several bacterial pathogens including Burkholderia Cepacia. One of the authors (JH) has published a description of trans-rectal biopsy of the prostate leading to prostate infections with Burkholderia cepacia, secondary to intrinsically contaminated ultrasound gel. That paper focused on the microbiologic and infection control aspects of the outbreak. In this report we describe in more detail the clinical aspects of 6 patients who had a biopsy of the prostate resulting in acute and chronic infection with B. cepacia including therapy and outcomes. Included is the first report of chronic prostatitis caused by B. cepacia.

Methods: Patients who underwent trans-rectal biopsy of the prostate between 2000 and 2002 in Halifax, Nova Scotia and St. John's, Newfoundland and subsequently were shown to have an infection with B. cepacia were reviewed retrospectively. Clinical and laboratory data was collected by retrospective chart review.

Results: Contaminated ultrasound gel in this case was an unrecognized source of infection. During the time these infections occurred, ultrasound gel was purchased in large 4 to 5 L bottles and distributed to smaller refillable 250 ml to 1 L squeeze bottles. Therapy may be difficult for B. cepacia prostatitis. They sometimes required multiple IV antibiotics early in treatment to resolve symptoms. In particular, chronic prostate infection with B. cepacia, which has not been previously described in the literature, may be difficult to treat and resolve.

Conclusions: This series illustrates the importance of sterile technique and also sterile ultrasound gel. Although the rectal mucosa is involved and considered not to be sterile, these infections demonstrate how harmful organisms can still be transmitted to the patient during a TRUS biopsy. Single sterile packets of ultrasound gel should be used and refilling of containers should be banned. Attention should be taken to follow the manufacturer's recommendations regarding device reprocessing to ensure proper cleaning and disinfection. After these changes were made in St. John's and Halifax there were no further urinary tract infections with B. cepacia.

UP019

Treatment of Chronic Radiation Cystitis with Hyaluronic Acid: A Case Series

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Introduction and Objective: Chronic radiation cystitis is a difficult clinical problem leading to significant patient morbidity. Treatment of this disorder is poorly defined and generally ineffective. In the normal bladder, hyaluronic acid is theorized to function as a protective barrier aiding the repair of damaged mucosa. Intravesical instillation of hyaluronic acid is a recognized treatment for interstitial cystitis and thus a potential agent for treatment of Radiation induced cystitis.

Methods: A retrospective chart review was performed assessing all patients at a single centre treated with hyaluronic acid for exacerbations of chronic radiation cystitis between 2006 and 2009. Symptoms of this disorder can be quantified by the Radiation Therapy Oncology Group (RTOG) score for genitourinary radiation toxicity. This scale measures symptomatology on a grade of 1 (minor) to 5 (major). RTOG scores were assigned to patients with post radiotherapy cystitis before and after a treatment course with hyaluronic acid (Cystistat).

Results: Eleven patients were identified who met such criteria. RTOG measurements for patients were an average of 2.9 (2–4) prior to hyaluronic acid instillation. After intravesical therapy with hyaluronic acid, the average RTOG toxicity score decreased to 1.6 (0–4). Eight patients (8/12) had improvement in their symptoms, 3 had stable symptoms, and only one patient showed worsening symptoms.

Conclusions: Hyaluronic acid instillations for radiation induced cystitis show promising preliminary results in this retrospective review. Further verification of its efficacy with prospective, randomized controlled trials is warranted.

UP020

Complications of Vasectomy and the Incidence of Post-Vasectomy Pain

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Introduction: Vasectomy is a simple, effective and commonly used method of contraception. In the United States, vasectomy is used by 11% of married couples and performed on approximately 500,000 men annually. Vasectomy is the most common urologic procedure performed today with an estimated 2-3% complication rate. Despite this low complication rate, vasectomy is the most litigated urological procedure. The complication of scrotal pain is very concerning to patients although there are only a few papers published on this topic. The true incidence of post-vasectomy scrotal pain is unknown, but estimates range from 0.9-33%. Our retrospective study examines the overall complication rate of vasectomies and specifically the incidence of scrotal pain.

Methods: A retrospective analysis was performed on patients who presented to a single urologist regarding possible vasovasostomy between March 1997 and January 2009. The vasectomies had been performed by a variety of physicians without a standardized technique. Patients with pre-existing testicular pain were excluded. Data regarding complications of vasectomy, specifically the incidence and duration of chronic scrotal pain were collected.

Results: A total of 313 patients were identified and reviewed. The mean time from vasectomy to consultation was 102 months (range 10–432 months). The complication rate for hematoma, epididymitis, wound infection, hydrocele and failure was 8.6%. The incidence of post-vasectomy scrotal pain was 9.6% (n = 30). Of the 30 patients with post-vasectomy scrotal pain, 18 (60%) had occasional discomfort, 6 (20%) had post-coital pain, and 6 (20%) had chronic pain. Only 5 (17%) of the 30 patients with scrotal pain had a complication of their vasectomy. The pain eventually resolved in 6 (20%) of the patients.

Conclusion: Most of the literature surrounding vasectomy complications comes from experienced centres and they estimate the risk at 2–3%. It has been previously shown that physician experience is the single most important factor relating to complications. Our data shows a higher complication rate of 8.6% possibly because it represents a variety of physician experience and non-standardized technique. We found the incidence of post-vasectomy scrotal pain to be 9.6%. Most of these patients (60%) had occasional discomfort. Further study investigating the incidence and natural history of post-vasectomy scrotal pain with standardized questionnaires is necessary to better understand this complication.

UP021

Effective Communication of Study Results to Study Participants with Prostate Cancer: Results of a Survey

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Introduction and Objective: There are few data on how often or how effectively clinical trial results are communicated to research study participants. We formally examined this issue in a survey which we administered to participants in an observational clinical study who were invited to an end-of-study presentation of study results.

Methods: We invited all participants of a longitudinal matched cohort study examining health effects of androgen deprivation therapy in older men with prostate cancer who were attending an end-of-study presentation to participate in our survey. Survey questions explored sociodemographic information as well as helpfulness of study results presentation, attitudes toward communication of study results, prior participation in clinical research, methods of communicating end-of-study results, and potential usefulness to others of study participation.

Table 1. UP021. Survey results

Participants completing the survey (n = 59)	Study Participants 68%	Spouse 10%	Other Guest 22%
Was the study presentation informative?	Very informative/ Informative 87.5%	Not Informative 12.5%	
As a participant of a clinical research study do you have the right to be informed about study results when they are available?	Strongly agree/ Agree 85%	Neutral/ Not applicable 15%	Disagree 0%
If you had participated in any other research, were you invited for presentation or received study results?	Yes 14%	No 86%	
How do you prefer to receive study results?	Email 46%	Presentation 45%	Individual meeting with study personnel 9%
Would you be more/less likely to participate in a study, where you know you would be provided with the results?	More likely/ Likely 90%	Neutral 9%	Less likely/ Lot less likely 2%
Are you satisfied with the way result were provided to you today?	Very satisfied/ Satisfied 100%	Not Satisfied 0%	
Best person to communicate study results?	Study Investigator 74%	Family physician 12%	Specialist/ Consultant 14%
Do you think this study and presentation benefit other patients?	Very likely/ Likely 91%	Neutral 7%	Unlikely 2%

Results: There were 59 of 70 presentation attendees (84%) who returned usable surveys. Thirty-nine (39) of 59 survey respondents were study participants while the rest were spouses or other guests; 71% of respondents were 65 years or older, 81% had completed at least some college or university, and 91% were either satisfied or very satisfied with participating in the study. Thirty-three percent of them had participated in clinical research before. Other key survey responses are summarized in Table 1.
Conclusion: The vast majority of participants in our study clearly wanted major end-of-study results made available to them, with equal numbers desiring an e-mail summary or a group presentation. Most expected this to come from the study's principal investigator. Yet this seems to be happening uncommonly. An additional advantage of ensuring at the outset that such a presentation will occur may be to enhance participant recruitment and retention by gaining their trust, particularly in studies without many direct personal benefits to participants.

UP022

Development of a Site-Specific BioBank to Enhance Genitourinary Oncology Biomarker Research

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Introduction and Objective: The genitourinary (GU) oncology division at Princess Margaret Hospital (PMH) has developed a site-specific BioBank to serve as a central repository for biospecimens obtained from patients attending out-patient clinics within the division. The GU BioBank was built to support research activities within the institution and beyond in a collaborative and accountable manner.
Methods: All consenting patients at high-risk for, or with bladder, kidney, prostate, and testis cancers (the Cohorts) agree to provide specimens prior to, during and following their treatment(s). Each sample collection point (Clinical State) is dictated by detailed flow diagrams developed for each disease cohort. We have developed the following number of clinical states for each disease cohort: Prostate (14), Kidney (11), Bladder (7), Testis (11). All blood and urine specimens are processed and stored by our collaborators at the Ontario Cancer Biomarker Network (OCBN). The specimens are catalogued, centrifuged, aliquoted, bar-coded, and stored in liquid nitrogen. Relevant clinical databases within the division are used for clinical outcomes determination. The GU Site group committee approves protocols and distributes samples to requesting investigators (following Research Ethics Board approval). The hierarchy for sample use gives precedence to those performing in-house academic projects, followed by collaborative academic projects, and lastly for commercial projects.
Results: Since the date of its inauguration in May 2008, over 3000 patients have been recruited to the GU BioBank, and over 45,000 biospecimen aliquots have been stored. The GU Site BioBank continues to expand at a rate of 35 – 50 new participants per week, with a refusal rate of 7%. As of Jan 1 2010, the following number of specimen sets (one specimen set = all aliquots of plasma, serum, DNA and urine stored per patient per Clinical State) were available per disease cohort: Bladder (694); Prostate (2017); Kidney (329); Testicular (98); Other (133).
Conclusions: Focus to-date has been on producing a sufficient number of high quality specimens to enable statistically significant results in proposed studies. The GU BioBank has now reached this point for several Clinical States, and we have recently approved several research proposals requesting specimens from the BioBank. By enabling such research, we hope to facilitate the discovery of new diagnostic and prognostic biomarkers and achieve our ultimate goal of personalized medicine and improved outcome for GU oncology patients.

UP023

Side Effects Causing Premature Termination of 3-year Maintenance Intravesical BCG: Not So Common

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Introduction and Objective: Bacillus Calmette-Guerin (BCG) is the treatment of choice for the management of high-risk non-muscle invasive bladder cancer. A large randomized controlled trial has shown that maintenance BCG improves recurrence-free survival and worsening-free survival. However, the 3-year maintenance BCG (SWOG) protocol, consisting of 27 installations, was shown to be associated with a very low completion rate of 16%, attributed largely to the side-effects of the treatment. We evaluated the rates of completion and reasons for premature treatment termination in our patients undergoing maintenance BCG with the SWOG protocol.
Methods: We evaluated 54 consecutive patients who were intended to receive a 3-year maintenance course of BCG at our institution between July 1 2003 and June 30 2009. Basic demographic data, treatment response, adherence to treatment and side effects were collected retrospectively. Moderate to severe side effects were defined as those that mandated

discontinuation of therapy. Kaplan-Meier survival curves were employed to analyze survival data.
Results: The mean age of the entire cohort was 67 years (range 49–89) and 42 (77.8%) patients were male. The median number of instillations was 21 (range 6–27). In total, 33 patients had a minimum of 3 years of follow-up allowing for completion of the maintenance protocol. Of these 33 patients, 15 (45%) completed the treatment without premature termination, 3 (9%) did not complete due to death of unrelated causes during the treatment. Four (12%) did not complete as they were lost to follow-up, 8 (24.2%) patients did not complete due to BCG failure, while only 3 (9%) patients prematurely terminated treatment due to side-effects. This is demonstrated in the freedom from interruptions due to side effects survival graph.
Conclusions: These results illustrate that contrary to previous findings, in a real-life clinical setting, side effects play a minor role (9%) in preventing patients from completing BCG maintenance therapy and that a significant number (45%) of patients are able complete the full course. Considering the well illustrated benefits of maintenance BCG, concerns of frequent and significant side effects should not deter clinicians from its use.

UP024

Perioperative High-Dose Intensity M-VAC (HDI MVAC) for Muscle-Invasive Urothelial Carcinoma

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Introduction and Objective: Meta-analyses of randomized trials indicate that overall survival is improved with the use of neoadjuvant chemotherapy (NAC) prior to cystectomy for muscle invasive urothelial carcinoma (UC) of the bladder. Typically perioperative cytotoxic regimens are selected based on objective response & survival benefits observed in the metastatic setting. HDI MVAC intensifies exposure to cisplatin & doxorubicin and shortens treatment time. In metastatic UC, HDI MVAC has a higher response rate (72%), lower neutropenia & mucositis rates, and superior survival compared to M-VAC (Sternberg 2006). These potential advantages led to its perioperative use at our institution & we report our results to date.
Materials and Methods: Patients (pts) receiving HDI MVAC as adjuvant or NAC for muscle-invasive UC were identified from institutional electronic databases. Pts with distant metastases were excluded. Chemotherapy was given as described by Sternberg (2001). Baseline, treatment & outcome data were extracted & analyzed.
Results: Twenty eligible pts with muscle-invasive UC were identified with mean follow up of 12 mths (range 1.5–43.4). M:F 17:3, median age 56 (range 39–76), ECOG status 0:1:2 was 12:6:1. There were 101 cycles given with 2 pts still on treatment. Fifteen pts have completed treatment as planned (11 pts had 6 cycles & 4 pts had 4 cycles). Three pts stopped treatment after 4 cycles due to fatigue (2) or urosepsis (1). No toxic deaths were observed. Five pts had treatment delays & 2 pts had febrile neutropenia. Median survival to date is 8.1 mths (range 1.5–43.4). In the adjuvant group (n = 12), 10 pts had resected stage 4 disease: pT4aN2 (2 pts), pT4aN1 (4), pT3bN1 (2) & pT3aN1 (2) and 2 pts had pT3aN0. Seven adjuvant pts have had recurrence & 6 have died. All pts in the NAC group (n = 8) had cystectomy. Downstaging occurred in 5/6 evaluable pts and RECIST response was 5 PR & 1 SD. No pT0 was seen but 1 pt was pTaN0 and 4 were pT2N0. Three NAC pts have had recurrence & 2 have died.
Conclusions: This HDI MVAC cohort was younger and had high risk UC (74% pN+). Treatment was feasible & toxicity consistent with prior reports. Only 1 neoadjuvant pt had major response. HDI MVAC is a reasonable perioperative option for muscle invasive UC, but prognosis remains poor.

UP025

Microscopic Hematuria as a Predictor of Significant Urologic Pathology

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Introduction and Objective: To determine how often patients who present to urologists with microscopic hematuria, and are investigated, are diagnosed with significant disease.
Methods: A retrospective chart review was performed of 248 consecutive patients who were referred with microscopic hematuria from January 2003, to December 2006. All patients included underwent full urologic work-up including, urinalysis, urine cytology, upper tract imaging, and cystoscopic examination.
Results: The average age was 60 years. These included 123 females and 125 males, with average ages of 61 and, 59 years respectively. Urologic malignancy was detected in four patients, one female and three males. All patients with malignancy were over the age of 60 and, all were smokers. Three of the patients were diagnosed with Ta lesions, of these, one had atypical cytology. One patient was diagnosed with T1G3 with CIS, with cytology showing TCC. This makes for an overall detection rate of 1.61%.
Conclusions: In this population it is suggested that the presence of microscopic hematuria in smokers over the age of 60 can be associated with significant urologic pathology. In non-smokers under the age of 60 with microscopic hematuria investigation is extremely low yield.

UP026

Antitumour Activity of TRAIL Combined with Gemcitabine or Antisense Oligodeoxynucleotide Targeting Bcl2 in Xenogeneic Models of Human Bladder Cancer

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Introduction and Objective: Superficial bladder transitional cell carcinoma (TCC) requires adjuvant intravesical therapy to prevent recurrence and progression. Tumour necrosis factor-related apoptosis-inducing ligand (TRAIL) can selectively induce apoptosis in most tumour cells. In partially TRAIL-resistant TCC cells, we have recently observed that gemcitabine and down-regulating Bcl2 with antisense oligodeoxynucleotide targeting Bcl2 (ASO-Bcl2) enhance apoptosis. These findings motivated us to further test the antitumour activity of TRAIL, combination of TRAIL with gemcitabine or ASO-Bcl2, in nude mice xenografted with human TCC cells.
Methods: Nude mice were either subcutaneously (s.c.) implanted with UMUC14 cells in their left flanks or orthotopically with Ku-7 cells in their bladders. When s.c. tumours reached ~3 mm in diameter, animals were treated with (a) TRAIL, intratumour injection (i.t.) or intraperitoneal injection (i.p.), 20 μg daily; (b) gemcitabine, i.p., 2 mg twice weekly; (c) saline (control), i.t.; for 6 injections per animal. At 4 days after Ku-7 cell instillation, animals were allocated to intravesical treatments: (a) TRAIL, 40 μl (20 μg) on day 4, 5, 6, 11, 12, 13; (b) TRAIL, plus gemcitabine (5 mg/ml) on day 7, 8, 14, 15, 19, 20; (c) TRAIL, plus ASO-Bcl2 (1000 μ*M*) on day 7, 8, 14, 15, 19, 20; (d) saline control.
Results: Based on cytotoxicity data, TCC cells were divided into sensitive or partially resistant to TRAIL or gemcitabine. UMUC14 cells were sensitive to TRAIL but partially resistant to gemcitabine, while Ku-7 cells were partially resistant to TRAIL. All 4 animals bearing s.c. UMUC14 tumours were cured by TRAIL i.t. and 2 of the 4 tumours were cured by gemcitabine i.p. No tumour was cured by TRAIL i.p. or saline i.t. For the orthotopic Ku-7 tumour model, the control group (6 mice) all had tumour with a median survival of 46 days. Other 3 groups (10 mice per group) received instillations of TRAIL, or TRAIL plus gemcitabine or ASO-Bcl2, attained a significant survival benefit over the controls with median survival of 95, 83 and 70 days, respectively. Tumour-free survivals were observed.
Conclusions: TRAIL can effectively control tumour growth when it is given i.t. or intravesically. Combination of TRAIL with gemcitabine or ASO-Bcl2 has not enhanced efficacy *in vivo* and needs further study.

UP027

Inhibition of Tyrosine Kinase and mTOR Signaling Pathways: Effect on Migration and Proliferation of Bladder and Kidney Cancer Cells

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Introduction and Objective: Management of advanced renal cell carcinoma (RCC) and bladder transitional cell carcinoma (TCC) remains a clinical challenge. Improved understanding of cell biology has led to development and approval of several new agents with specific signaling targets. Nevertheless, questions remain about the optimal use of these agents and combination approaches. This study investigated the impact of tyrosine kinase inhibitors (TKIs: Sorafenib, Sunitinib), mammalian target of rapamycin (mTOR) inhibitor (mTORI: Temsirolimus) and tumour necrosis factor-related apoptosis-inducing ligand (TRAIL) on migration, invasion and proliferation of RCC and TCC cells.

Methods: RCC (786-O, ACHN, A498) and TCC (HT1376, UMUC14, T24, RT112, 253J, MGHU3) cells in logarithmic phase in appropriate media were tested. To assess drug cytotoxicity, TCC cells were exposed to varying concentrations of sorafenib, sunitinib or temsirolimus for 20 h followed by TRAIL or growth medium for additional 20 h, after which the proportion of viable cells was determined by MTT assay. Expression of apoptotic proteins was determined by Western blot analysis. To assess impact on invasion, RCC cells (in Matrigel chambers of 8-micron pores) were incubated with TKIs in media without FBS; using 10% FBS in the lower chamber media as chemo-attractant. After 40 hours of migration, the filter containing the adherent cells was stained with hematoxalin, imaged under microscope and counted using Metamorph software. A wound-healing scratch assay was used to assess the migration of RCC cells cultured with TKIs. Cells were incubated and allowed to migrate for ~24 h with time-lapse images captured by an axiovert microscope and analyzed using t-scratch software.

Results: Sorafenib inhibited proliferation of TCC cells irrespective of TRAIL-sensitivity. The sorafenib induction or augmentation of TRAIL-apoptosis in TCC cells was accompanied by increased activation of proapoptotic proteins (XIAP, p53, procaspases 9, 8 and 3). Sunitinib and Temsirolimus did not enhance the anticancer effect of TRAIL. Compared with controls (100% invasion), the invasion of RCC cells was reduced to <10% by Sorafenib and 30–75% by Sunitinib. A time- and dose- dependent RCC migration inhibition by TKIs was observed. Sorafenib, a more pan TKI, had greater effect than Sunitinib.

Conclusions: Inhibition of the tyrosine kinase pathway using sorafenib (but not Sunitinib) potentiated TRAIL-induced lethality in TCC cells. TKIs also inhibit migration of RCC cells. This study provides valid rationale to use TKIs and TRAIL in neo-adjuvant therapy of RCC and TCC.

UP028

Females are in Higher Risk of Isolated Local Recurrence after Radical Cystectomy for Bladder Cancer

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Introduction and Objectives: Local recurrences are relatively uncommon after radical cystectomy and patients with local recurrences are known to have poor prognosis. Local recurrence may potentially be avoidable with correct surgical techniques such as larger resection margins or extended lymph node dissection. Therefore, the study objective was to identify risk factors for isolated local recurrence for the purpose of avoiding these events in the future.

Material and Methods: We studied a large retrospective RC database (n=601) including BC patients operated at the University Health Network, Toronto, Canada (n=351, study period 1992-2008) and University of Turku, Turku, Finland (n = 250, 1986–2005) with special attention to quality of the data. After excluding non-TCC tumours and patients without recurrence, we had a total of 181 patients. Isolated local recurrence was defined as tumour recurrence in the pelvis caudal to aortic bifurcation with no evidence of distant metastasis. Analyzed variables included gender, smoking, type of diversion, extent of node dissection (<15 nodes vs. ≥15 nodes removed), pT-stage, N-status, CIS, lymphovascular invasion, margin status and neoadjuvant/adjuvant chemotherapy. Correlation between recurrence type and clinicopathological variables was examined using univariate analysis, Kaplan-Meier survival method and cox regression multivariate analysis.

Results: Of the 181 patients with recurrences, 37 had isolated local recurrence representing 20% of all recurrences and 7% of all TCC patients undergoing RC. The mean time to local recurrence was significantly shorter than to distant recurrence (10 vs. 19 months, $p = 0.025$) and the mean disease specific survival was 19 vs. 32 months for local and distant recurrence, respectively ($p = 0.14$). In a multivariate analysis, female gender was the only significant risk factor for local recurrences (HR 3.41, 95% CI 0.13–0.65, p-value = 0.003). The rates for isolated local recurrences in patients undergoing extended and limited node dissection were 15%, and 22%, respectively, but the difference was not significant ($p = 0.29$). Though positive bladder surgical margins were reported in 6% of all cases of recurrence, they had no correlation with local recurrence ($p = 0.7$) or gender ($p = 0.3$).

Conclusions: Surprisingly, female gender was significantly associated with risk of isolated recurrence. The reason for this observation remains speculative, but attention should be paid to surgical technique in females. There was also a trend for decreased local recurrences in patients receiving extended lymphadenectomy.

UP029

Radical Cystectomy Outcome and Prognostic Parameters: Combined Results from Two Large Institution

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Introduction and Objectives: Muscle-invasive bladder cancer (BC) is an aggressive tumour with high risk of relapse after radical cystectomy (RC). As the role of perioperative chemotherapy after radical cystectomy is not well defined at the present time, we are in need of prognostic factors to determine patients at high risk of disease relapse. Our objective was to present combined results from two large series and to analyze our detailed database for variables associate with tumour relapse and poorer survival.

Material and Methods: A large retrospective RC database including BC patients operated in University Health Network, Toronto, Canada (n = 351, study period 1992–12008) and University of Turku, Turku, Finland (250, 1986–2005) was studied. After excluding non-TCC tumours (n = 46), 555 patients were available for analysis. The relationship of gender, smoking, CIS, lymphovascular invasion (LVI), margin status, pT-stage, lymph node (LN) status, LN density (LND) and adjuvant chemotherapy to disease and overall specific mortality (DSS, OAS) was examined using univariate and multivariate analysis as well as Kaplan-Meier survivals and Cox regression analysis.

Results: The mean FU was 4.0 years (median 2.3, range 0-20 years). The 5-y and 10-y DSS was 70%, and 69%, respectively. The 10-y DSS for pT1, pT2, pT3, and pT4 were 81%, 66%, 53%, and 39%, respectively. For ND- and ND+ patients the 10-y DSS was 76%, and 36%, respectively. For ND positive patients with LND <20% 10-y DSS was 43% compared to 29% in patients with LND <20%. In a multivariate analysis, factors associated with DSS were higher pT-stage, positive LN, and LVI (p <0.001, <0.001 and 0.002, respectively), and those associated with overall mortality were older age, higher pT-stage, positive LN and LVI (p 0.04, 0.001, <0.001 and 0.003, respectively). When the effect of LVI was studied in detail, it was significant risk factor for the whole cohort and ND negative patients ($p < 0.000$), but not in ND positive patients ($p = 0.219$).

Conclusions: Our results generally confirm the outcome reported in many previous series. RC offers high rates of survival in organ-confined and ND negative tumours. In addition to tumour stage and nodal status, LVI

is significant risk factor for BC related death. Although ND metastasis is associated with significantly poorer survival, it should be emphasized that radical cystectomy offers long-term survival in approximately 1/3 of LN positive cases, which is similar to some previous reports which had been sometimes deemed too optimistic. In addition, LND with a cut-off of 20% offers further prognostic information for ND positive patients.

UP030

Smokers Present with Advanced Bladder Tumours at the Time of Radical Cystectomy

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Introduction and Objectives: Smoking is a known carcinogenic associated with significant morbidity and health care costs. Although smoking is a documented risk factor for bladder cancer (BC), less is known about the natural history of tobacco-induced tumours compared to BC in non-smokers and whether it impacts presentation or outcome of muscle invasive BC. The objective of the study was to evaluate BC pathology and survival among smokers and non-smokers after radical cystectomy (RC).

Material and Methods: A large retrospective RC database including BC patients operated at the University Health Network, Toronto, Canada (n = 351, study period 1992–2008) and University of Turku, Turku, Finland (n = 250, 1986–2005) was accrued. Patients with non-TCC tumours (n = 46) or unknown smoking status (n = 54) were excluded resulting in 501 patients for analysis. Smoking was defined as any documented history of smoking (both current and former smokers). Other variables included gender, age, tumour pT-stage, nodal status and adjuvant chemotherapy. Correlation between smoking and clinicopathological variables was examined using univariate analysis, Kaplan-Meier survival and cox regression multivariate analysis.

Results: The study included 501 patients with a mean FU of 4.2 years (median 2.4, range 0–22); 78% were males and the mean age was 66 years; 35% had extravesical disease and the node metastasis rate was 20%; 320 (64%) patients had a documented history of smoking (48% reported to be current and 52% former smokers). Significant variables associated with smoking in univariate analysis included: male gender ($p = 0.006$), advanced pT-stage ($p = 0.035$), nodal metastasis ($p < 0.000$) and younger age (mean age 65 vs. 68 years, $p = 0.002$). All of these variables remained significant in a multivariate logistic regression analysis. With Kaplan-Meier analysis there was no difference in recurrence free survival (RFS) and disease specific survival (DSS) between smokers and non-smokers (log-rank p-value 0.33 and 0.43, respectively), while overall survival (OS) was significantly poorer among smokers (log-rank p-value 0.044). In multivariate Cox-regression analysis for DSS, higher pT-stage and positive nodes remained significantly associated with poorer outcome ($p < 0.001$, and 0.002, respectively).

Conclusions: Smokers present at an earlier age, with more advanced tumour stages and with increased frequency of nodal metastasis at the time of RC. Smoking is an independent predictor of OS but not DSS after RC. A possible reason for the discrepancy between more advanced tumours, but similar disease-specific survival is the presence of competing risk factors for death among smokers.

UP031

Radical Cystectomy for Patients with pT4 Urothelial Carcinoma in a Large Population-Based Study

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Introduction and Objective: To examine cancer-specific mortality (CSM) in patients with pT4N0-3M0 urothelial carcinoma of the urinary bladder (UCUB) and to compare it to patients with pT3N0-3M0, in a population-based cohort treated with radical cystectomy (RC).

Materials and Methods: Radical cystectomies were performed in 5625 pT3-T4bN0-3M0 patients with UCUB within 17 Surveillance, Epidemiology and End Results (SEER) registries between 1988 and 2006. Univariable and multivariable models tested the effect of pT4a vs. pT4bvs. pT3 stages on CSM. Covariates consisted of age, gender, race, lymph node status and SEER registries. All analyses were repeated in 3635 N0 patients..

Results: Of 5625 patients, 2043 (36.3%) had pT4aN0-3, 248 (4.4%) had pT4bN0-3 and 3334 had pT3N0-3 (59.3%) UCUB. The 5-year CSM was 57.6% vs. 81.7% vs. 53.9% for respectively pT4aN0-3 vs. pT4bN0-3 vs. pT3N0-3 patients (all log rank $p = 0.008$). In multivariable analyses the rate of CSM was 2.3-fold higher in pT4b vs. pT3 ($p < 0.001$), 1.1-fold higher in pT4a vs. pT3 ($p = 0.002$) and 2.0-fold higher in pT4a vs. pT4b patients. After restriction to pN stage, pT4b patients had a 2.3-fold higher rate of CSM than pT3 patients ($p < 0.001$) and a 2.1-fold higher rate in pT4a vs. pT4b ($p < 0.001$). The CSM rate was the same for pT4a and pT3 patients ($p = 0.1$).

Conclusions: Our findings indicate that pT4a patients have similar CSM as pT3 patients. In consequence, RC should be fully considered in that group.

UP032

Human Papilloma Virus (HPV) Infection and Abnormal P53 Expression in Transitional Cell Carcinoma (TCC) of Urinary Bladder: Correlation with Clinic-Histopathological Parameters

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Introduction and Objective: Data on the role of HPV in bladder carcinogenesis are controversial. Dysregulation of p53 is critical in the development of TCC of urinary bladder. Few studies have documented concurrent HPV positivity and abnormal p53 accumulation in bladder TCC. Aims of our study were to assess frequency of p53 gene mutations, prevalence of HPV infection in patients with TCC of urinary bladder and to find out its correlation with standard clinical and histological parameters for tumour recurrence and progression.

Methods: Tumour tissue samples of 50 patients with transitional cell carcinoma (TCC) of urinary bladder obtained by TURBT or radical cystectomy were examined histopathologically. P53 mutations were assessed by DNA isolation and PCR-SSCP (polymerase chain reaction-single strand conformation polymorphism) analysis. PCR (Polymerase Chain Reaction) was used to detect HPV DNA (type 16 & 18). Data were analyzed by Fisher's two tailed t-test & Pearson's chi-square test using SPSS 15 statistical software.

Results: Twenty (40%) patients had presented with primary superficial tumours,12 (24%) with recurrent superficial and 18 (36%) had invasive TCC. 10% had Ta, 54% had T1 and 36% had T2 lesion. Out of 50 patients 7 (14%) had p53 mutations detected in exons 5 and 6. P53 mutations were more in invasive tumour (n = 4, 57.1%) as compared to superficial tumour (n = 3,42.9%). None of the 50 bladder cancer specimens were positive for HPV DNA.

Conclusion: HPV 16 & 18 prevalence is very low amongst Indian patients with bladder cancer and therefore unlikely to be the causative factor for bladder TCC. P53 mutations are associated with aggressive behavior. Therefore patients having tumour with p53 mutations should be followed up closely. This molecular prognosticator may play a role in the clinical routine management of patients with bladder tumour. Further studies should explore their potential clinical significance taking into their cost-effectiveness.

UP033

Specificity of Urinary Cytology in the Detection and Surveillance of Bladder Cancer: A Contemporary Analysis and Comparison with Other Urine Markers

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Introduction and Objective: Urothelial carcinoma of the bladder is a common malignancy and a major cause of morbidity and mortality. Urinary cytology is the most widely used non-invasive test for its detection and surveillance. We aimed to re-evaluate the specificity of urine cytology during a contemporary period at our institution in comparison to other urinary biomarkers.

Methods: Data from 1,114 consecutive patients corresponding to 3,261 specimens (2,979 cytologic and 282 histologic specimens) between January 2006 and July 2006 were retrieved. Subsequent cytologic and surgical specimen reports up to 2008 were examined with a minimum two year follow-up period. Collected parameters included date of collection, reason for urinary evaluation, type of specimen (voided, washing or catherized) and tumour grade. Atypical diagnosis was considered negative.

Results: On cytological examination, 71% of specimens were benign, 23% atypical and 6% suspicious or positive for urothelial carcinoma. The reason for collection was surveillance in 48%, new onset hematuria in 22% and other causes in the remaining cases. Depending on tumour grade, sensitivity results ranged from 11% for low-grade tumours to 49% for high-grade ones. Importantly, specificity of urine cytology ranged from 77% to 89% (depending on type of urine collection and type of clinical presentation), similar to other reported results from other urinary markers (40–90%).

Conclusion: Our institution's experience with regards to the sensitivity of urine cytology is similar to other reports in the literature. However, the specificity of urine cytology is significantly lower than reported historically. These findings need to be validated in a larger cohort of patients across several institutions to definitively evaluate whether there remains an advantage for urine cytology over the other urinary marker assays

UP034

Invasive Phenotype of Bladder Cancer Cell Lines Correlates to Differential Expression of Notch Receptors

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Introduction and Objectives: The Notch pathway plays a critical role in growth and differentiation, and is involved in cancer progression in different organ sites. Little is known about Notch in bladder cancer. In this study, we evaluated the expression of Notch receptors in a panel of bladder cancer cell lines.

Methods: Thirteen bladder cancer cell lines with previously described invasive properties and epithelial/mesenchymal characteristics were screened for expression of the Notch receptors by Western blot and real-time PCR. Immunohistochemistry (IHC) was performed on a tissue microarray (US Biomax, Inc., Rockville, MD) that included cores from 152 patients with bladder cancer. Alterations in gene expression after Notch-2 silencing with siRNA were measured by expression microarray in 3 cell lines. Genes that changed by at least 2-fold in all 3 cell lines were selected for further analysis. Wound healing assays were performed after treatment with Notch-2 siRNA versus scrambled siRNA. The Mann-Whitney test was performed for statistical analysis.

Results: Epithelial cell lines with low invasive potential expressed Notch-1 at high and Notch-2 at low relative levels ($p = 0.03$ and $p < 0.01$, respectively) compared to invasive cell lines. Highly invasive, mesenchymal cell lines expressed high levels of Notch-2 and low levels of Notch-1. These results were validated by Western blot and IHC (TMA). Microarray analysis revealed altered expression of genes related to epithelial to mesenchymal transition (EMT), protein and endosome trafficking, and cell-cell connections, when Notch-2 was silenced with siRNA. Notch-2 silencing decreased the migration of UC3 cells in the wound healing assay ($p = 0.02$).

Conclusions: These results provide preliminary evidence for a role for Notch in the progression of bladder cancer and it is suggested that this may be related to EMT. Further investigation is needed to assess the suitability of Notch as a therapeutic target, and it would appear that selective inhibition of individual Notch receptors may be preferential to global inhibition.

UP035

Urinary microRNA as an Accurate Urinary Diagnostic Marker for Urothelial Cancer

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Introduction and Objectives: MicroRNAs (miRNAs) are a class of small RNAs that are important regulatory molecules, involved in several cell processes such as developmental timing, stem cell division, and apoptosis. Dysregulated miRNAs have been identified in several human malignancies, including bladder cancer tissue samples, and may confer a "tumour signature" that can be exploited for diagnostic purposes. We report on a prospective pilot study investigating the diagnostic capability of miRNAs in the urine of patients with urothelial cancer.

Methods: Voided urine samples were collected from 8 patients with urothelial carcinoma just prior to bladder tumour resection as well as 5 age-matched healthy control patients. Pathology demonstrated both low grade and high-grade cancer. Total RNA was isolated and quantitative reverse transcriptase-polymerase chain reaction was performed on the RNA extracts using primers for 4 miRNAs shown previously to be dysregulated in solid urothelial carcinomas with RNU6B as the endogenous control. Standard urine cytology was performed on all samples in a blinded fashion.

Results: Two miRNAs were found to be significantly dysregulated in the urine from cancer patients with miR-A showing an average 10.42-fold decrease ($p < 0.05$) and miR-B showing an average 2.70-fold increase ($p > 0.05$) in the cancer samples compared to the normal controls. Using these 2 miRNAs, a decision-tree prediction model was generated yielding a specificity of 100% and a sensitivity of 87.5%. The sensitivity and specificity of the cytology on the same urine samples was 50% and 80% respectively.

Conclusion: MiRNA expression levels are altered in bladder cancer and may have diagnostic and prognostic value. This preliminary study of candidate urinary miRNA in patients with both low grade and high-grade urothelial cancer demonstrated a significantly improved diagnostic accuracy over cytology. These results provide rationale for further studies on discovery and validation of candidate miRNAs in voided urine and may potentially lead to the development of a non-invasive and sensitive test for bladder cancer diagnosis and prognosis.

UP036

Continent vs. Incontinent Urinary Diversion after Radical Cystectomy for Urothelial Carcinoma of the Bladder: Comparison of Utilization and Complication Rates

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Introduction and Objectives: Recent literature indicates that continent urinary diversion (CD) is offered to a minority of patients after radical cystectomy (RC). An elevated rate of peri-operative complications may represent an explanation for this observation. We examined the rates of immediate inpatient complications for CD vs. incontinent urinary diversion (ID).

Methods: Between 2003 and 2008, 2719 RC were performed in the state of Florida. The type of diversion and complications were recorded within the Florida Inpatient Database. Statistical analyses assessed the overall and specific complication rates in patients with CD and ID after RC. Covariates consisted of age, gender, race, hospital volume (HV) and surgical volume (SV), as well as Charlson Comorbidity Index.

Results: Between 2003 and 2008, the rate of complication after RC ranged from 9.2 to 10.5%. The overall complication rate after CD was 29.5% vs. 39.2% for ID ($p < 0.02$). In univariable models, younger age

(OR: 1.02 [95% CI = 1.01-1.03]; $p < 0.001$); female gender (OR: 0.78 [95% CI = 0.63-0.96; $p = 0.02$) and CD (OR: 0.65 [95% CI = 0.49-0.86]; $p = 0.003$) were significant predictors of lower overall complication rates. In multivariable analyses, younger age (OR: 1.02 [95% CI = 0.66-1.22]; $p < 0.001$), female gender (OR: 0.72 [95% CI = 0.58-0.89]; $p = 0.003$); higher HV (OR: 1.93 [95% CI = 1.49-2.52] $p < 0.001$) and higher SV (OR:1.71 [95% CI = 1.25-2.31]; $p < 0.001$) remained independent predictors of lower complication rates. However, after adjustment for covariates, the type of diversion failed to predict any type of complications.
Conclusions: CD does not predispose to higher rates of complications. In consequence, CD should be encouraged whenever not medically contraindicated.

UP037

The Rates of Metastatic Bladder Cancer are Increasing Over Time: A Population-Based Analysis

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Introduction and Objectives: To assess the rate of metastatic bladder cancer at diagnosis in a population-based tumour registry.
Methods: Between 1988 and 2006, 29 381 patients were identified within 17 Surveillance, Epidemiology and End Results (SEER) registries with diagnosis of bladder cancer of all stages. We examined the rates of metastatic bladder cancer at diagnosis throughout the entire study period. Multivariable logistic regression models examined the impact of year of surgery on metastatic bladder cancer diagnosis after adjusting for patient age, gender and race.
Results: The overall rate of metastatic bladder cancer was 7.1% and it increased from 6.3 to 8.4% over the study period (relative increase: 1.3%, χ^2 trend: $p < 0.001$). The increase in metastatic bladder cancer rates was more pronounced in females (relative increase: 6.5%; from 1.4 to 9.1%, χ^2 trend: $p = 0.4$) than in males (relative increase: 1.5%; from 5.2 to 7.6%, ^{2} trend: $p < 0.001$) and in octogenarians (relative increase: 1.2%; from 8.4 to 9.8%, χ^2 trend: $p = 0.7$) than in younger patients (relative increase: 1.1%; from 7.9 to 8.7%, χ^2 trend: $p = 0.003$) and in Caucasians (relative increase: 1.4%; from 6.0 to 8.3%, χ^2 trend: $p < 0.001$) than in other race categories (relative increase: 1.0%; from 8.8 to 8.9%, χ^2 trend: $p = 0.8$). Statistically significant differences in metastatic bladder cancer rates existed in various SEER registries. For example, the increase in metastatic rates was the highest in the Los Angeles and Utah registries (relative increase: 2.1%, from 6.1 to 12.6%, χ^2 trend: $p < 0.001$ and relative increase: 2.4%, from 3.8 to 9.1%, χ^2 trend: $p = 0.01$). In multivariable logistic regression models age, gender and race represented independent predictors of metastatic bladder cancer diagnosis ($p \leq 0.04$). Finally, more contemporary year remained the foremost predictor of higher rate of metastatic bladder cancer at initial diagnosis ($p < 0.001$).
Conclusions: The increase in metastatic bladder cancer rate is worrisome. Delay at presentation as well as a delay in referrals may be the underlying cause behind these increasing rates. Although the increase in trends is marginal, it represents a cause for concern, which indicates that primary care physicians and patients should be better sensitized to the importance of expedited referrals and self diagnosis.

UP038

Survival after Radical Cystectomy of non-bilharzial Squamous Cell Carcinomoa versus Urothelial Carcinoma: A North American Population-based Study

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Introduction and Objectives: We sought to examine stage at radical cystectomy (RC), as well as cancer-specific mortality (CSM) rates in non-bilharzial squamous cell carcinoma (SCC) RC patients relative to patients with urothelial carcinoma (UC) RC of the urinary bladder within a large population-based cohort. We hypothesized that SCC histological subtype fares a worse survival than UC patients.
Methods: Of 12 311 RC cases, we identified 614 (5.0%) SCC versus 11 697 (95.0%) UC individuals within 17 Surveillance, Epidemiology, and End Results (SEER) registries between 1988 and 2006. Differences in the rates of CSM were assessed using the cumulative incidence plots that control for non-cancer related mortality. Univariable and multivariable competing-risks regression models addressed the effect of histological subtype at RC for prediction of CSM. Covariates consisted of age, gender, year of diagnosis, race, pathological T and N stages, as well as tumour grade.
Results: After accounting for other-cause mortality, the cumulative CSM rates at 5 years were 40.3 and 35.1% for SCC vs. UC patients ($p < 0.001$, Gray). For the same time point, the CSM rates in organ confined (OC) disease were 25.0 and 19.8% for SCC vs. UC patients ($p = 0.2$, Gray) and 46.3 and 49.3% respectively for the same groups of patients in non-organ confined (NOC) disease ($p = 0.8$, Gray). In multivariable competing-risks regression models, SCC was not associated with a statistically significantly higher rate of CSM than UC histological subtype ($p = 0.06$, Gray). Similarly, SCC was unassociated with a higher risk of CSM after stratification according to OC and NOC disease ($p = 0.2$ and $p = 0.1$, Gray).
Conclusions: SCC is rare, and more frequently associated with non-organ confined disease. After accounting for non-cancer related mortality, which was never previously done with Cox regression models, SCC was not statistically significantly related to a worse prognosis than UC subtypes.

UP039

A Population-based Competing-risks Analysis of the Survival of Patients Treated with Radical Cystectomy for Bladder Cancer

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Introduction and Objective: The radical cystectomy (RC) population is very heterogeneous with respect of cancer-specific (CSM) and other-cause mortality (OCM). Comorbidities and comorbidities-associated events represent very important causes of mortality in RC patients. We examined the rates of CSM and OCM in a population-based RC cohort.
Methods: We identified 11 260 patients treated with RC for urothelial carcinoma of the urinary bladder between 1988 and 2006 within 17 Surveillance, Epidemiology and End Results database. Patients were stratified into 20 age-tumour stage categories. Poisson regression models were fitted to obtain estimates of CSM and OCM mortality rates at specific time points after RC.
Results: After stratification according to disease stage and patient age, CSM resulted as the main cause of mortality in all patients strata. Nonetheless, at 5 years after RC between 8.5 and 27.1% of deaths were attributable to OCM. The three most common causes of OCM were heart disease, other malignancies and chronic obstructive pulmonary disease. The most prominent effect on CSM was exerted by locally-advanced BCa stages. Conversely, age was the main determinant of OCM. Interestingly, even after adjusting for bladder cancer pathologic stage, CSM was higher in older individuals than in younger patients.
Conclusions: Our model represents a valuable tool capable of predicting OCM and CSM according to disease stage and patient age. The model results can help clinicians to better stratify the risk-benefit ratio of RC. Hopefully, this tool will be integrated into patient counseling and informed consent process prior to RC in patients who represent surgical candidates.

UP040

Advanced Age is an Independent Predictor of Cancer-Specific Mortality After Radical Cystectomy for Transitional Cell Carcinoma of the Bladder Cancer

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Introduction and Objectives: Prognostic significance of advanced age on cancer-specific mortality (CSM) following radical cystectomy (RC) remains controversial. Previous data demonstrated that advanced age predisposed to an increase in CSM, but in other studies it had no effect. However, in those reports, other-cause mortality (OCM), which may affect the rates of CSM, was unaccounted for. To further refine the existing analyses, we attempted to assess the effect of advanced age on CSM after RC within a large population-based cohort using competing-risks regression models.

Methods: Using the Surveillance, Epidemiology, and End Results (SEER)-17 database, we identified 11 854 patients who were treated with RC for transitional cell carcinoma of the BCa. Age was stratified into four decades: ≤59 years old, 60–69 years old, 70–79 years old, and ≥80 years old. Univariable and multivariable logistic regression models examined the effect of age on T and N stages at RC. Subsequently, cumulative incidence plots explored the impact of age on CSM rates, after accounting for OCM. Finally, competing-risks regression models tested the independent predictor status of age in CSM analyses.

Results: In multivariable logistic regression models, increasing age achieved independent predictor status (60–69: OR = 1.07, 95% CI = 0.96–1.18, ≥80: OR = 1.29, 95% CI = 1.12–1.47, $p < 0.001$). After controlling for OCM, the cumulative CSM rates at five years for age categories ≤59, 60-69, 70-79 and ≥80 years were respectively 31.6% vs. 35.1% vs. 35.6% vs. 43.6% ($p \leq 0.001$, Gray). In multivariable competing-risks regression analyses, increasing age achieved an independent predictor status of CSM (60-69: HR = 1.13, 95% CI = 1.04-1.24, ≥80: HR = 1.62, 95% CI = 1.44-1.82, $p \leq 0.007$).

Conclusions: Advanced age at RC for transitional cell carcinoma of the BCa is independently associated with significantly different outcomes, even after adjusting for the possibly confounding effect of OCM. This may imply that older patients are treated less readily with RC than their younger counterparts.

UP041

The Prognostic Ability of Various Nodal Coding Schemes in Bladder Cancer Patients treated with Radical Cystectomy: Results from the Surveillance, Epidemiology, and End Results Database

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Introduction and Objective: Several coding schemes have been proposed to best define the prognostic value of nodal status at radical cystectomy, namely lymph node density, number of positive nodes, number of removed nodes, and pathologic N-substages of the TNM classification. We compared the prognostic ability of these definitions for the prediction cancer-specific mortality (CSM).

Methods: Between 1988 and 2006, 7624 assessable patients underwent radical cystectomy and pelvic lymphadenectomy within 17 Surveillance, Epidemiology, and End Results registries. Univariable and multivariable Cox regression analyses addressed the prognostic impact of different nodal status coding schemes on CSM after surgery. Covariates consisted of age, gender, T stage and tumour grade. Harrell's concordance index quantified accuracy and 200 bootstrap resamples were used to correct for overfit bias.

Results: In multivariable analyses addressing CSM after surgery, nodal stage, regardless of its coding, achieved the independent predictor status ($p < 0.001$). Lymph node density represented the most informative predictor of CSM in the entire cohort (gain in predictive accuracy: 2.6%), followed by pN-substages (gain in predictive accuracy: 2.5%) and by the lymph-node density categorized in ≤20% and >20% (gain in predictive accuracy: 2.3%). However, the differences in predictive accuracy between the three coding schemes were not statistically significant.

Conclusions: Although several nodal coding schemes may appear conceptually attractive, from a prognostic perspective the pathologic N-substages perform well and represent a nodal coding scheme that all clinicians are familiar with.

UP042

Primary Radiation Therapy for Bladder Cancer: Practice Patterns in British Columbia

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Introduction and Objective: Primary radiation therapy (RT) for bladder cancer has yet to establish itself as a common treatment in Canada and the USA. Several centres have shown encouraging results with a multimodal organ-sparing approach that compares favourably to radical cystectomy. The published reports emphasize the requirement for the combination of complete tumour resection (TURBT), chemotherapy and RT. As with many aspect of bladder cancer management, it is unclear to what extent these guidelines are being followed. The aim of this study was to identify retrospectively the practice patterns in British Columbia for patients with bladder cancer who receive primary RT.

Methods: All patients undergoing radical cystoprostatectomy or primary RT between 1988 and 2007 were selected from the registry of the British Columbia Cancer Agency. Key demographic and clinical parameters were reviewed retrospectively.

Results: The mean age of patients receiving primary RT (n = 624) versus cystectomy (n = 571) was 75.0 versus 66.7 (P = 0.05) respectively. The majority of patients in both groups were clinical stage T2 (33.3% for RT and 16.7% for cystectomy). For patients receiving RT, 28.8% went on to have salvage cystectomy, indicating that treatment was likely performed with curative intent in a substantial proportion of patients. Chemotherapy was administered in 26.6% of XRT patients. Ten-year overall and disease specific survival for patients receiving primary radiation was 18.3% and 48.8%, respectively, which compared to 37.3% and 64.3% in patients undergoing cystectomy ($p < 0.01$).

Conclusions: Patients who received primary RT tended to be older and had a reduced overall and disease specific survival. While the survival differences may reflect bias in patient selection, there is also some evidence that RT is not being delivered in an optimal fashion. Specifically, only a small percentage of patients received concomitant radiosensitizing chemotherapy We are expanding the dataset to assess the presence of adverse risk factors (eg. associated hydronephrosis or carcinoma in situ) in patients undergoing RT, to assess the adequacy of pre-RT TURBT and also to assess post-RT urologic surveillance. This data will be used to initiate a prospective quality assurance initiative with the ultimate goal of establishing a multidisciplinary clinic for all patients with invasive bladder cancer.

UP043

Use of a Novel Parenchymal Clamp for Laparoscopic and Open Partial Nephrectomy

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Introduction and Objective: Increasing data advocates the wider use of partial nephrectomy for renal tumours amenable to this approach. We report the first North American use of this new parenchymal clamp for use in both laparoscopic and open partial nephrectomies.

Methods: Constructed with approximately 1 cm wide flat nitinol band; the device can be placed through a 10 mm laparoscopic port. The device is sterilizable, and can be reused a limited number of times. Operative technique followed standard technique: differences included that the renal hilum was not dissected out and the perirenal fat and renal capsule were dissected further than usual in order to facilitate placement of the clamp away from the edge of the tumour resection.

Table 1. UP043. Operative characteristics of cases with parenchymal clamp

Patient	Operative approach	Pre-op size of tumour (cm)	Side	Collecting system entry	Operative time (min)	Clamp time (min)	EBL (cc)
1	Transperitoneal laparoscopic	1.5	Right	No	165	21	150
2	Supra-11th flank	3.5	Left	No	133	10	250
3	Supra-11th flank	4	Left	Yes	140	17	250

Table 2. UP043. Pathologic results of cases

Patient	Pathology	Margins	Maximal dimension (cm)
1	Papillary RCC, Furhman grade 3/4	Negative	1.8
2	Clear cell RCC, Furhman grade 1/4	Negative	3.2
3	Clear cell RCC, Furhman grade 2/4	Negative	4.0

Fig. 1. UP043. Intraoperative photograph of clamp applied to kidney with initial incision into parenchyma (Patient #3).

Results: Three elderly patients (74 year old man(1), 70 year old lady(2) and 72 year old man(3) underwent partial nephrectomy; operative, pathology and laboratory results are summarized in Tables 1-3. Patients were discharged on postoperative day 3, 5 and 6 respectively. An intraoperative photograph of patient #3 is shown in Fig. 1.
Conclusions: In our small series, we found this parenchymal clamping device to be a safe and useful adjunct to partial nephrectomy.

UP044

Effect of Renal Hypothermia on Postoperative Renal Function in Partial Nephrectomy

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Introduction and Objective: To evaluate the effect of cold ischemia during open partial nephrectomy on postoperative renal function and compare it to warm ischemia during laparoscopic partial nephrectomy.
Materials and Methods: We reviewed our oncologic database for partial nephrectomy at The Ottawa Hospital from 2002 to 2008. There were 145 consecutive patients who underwent partial nephrectomy for renal masses. Patients with single kidney (n = 17) and those with unknown hilar clamp time (n = 7) were excluded from the analysis. There were 120 patients included in the analysis. Eighty-three patients (69.2%) had an open approach while 37 patients (30.8%) had a laparoscopic approach. Cold ischemia was achieved with ice-slush renal surface cooling for 10 to 15 minutes in all but 1 patient undergoing open partial nephrectomy and this was also excluded from analysis. All patients undergoing laparoscopic partial nephrectomy underwent warm ischemia. Cockroft-Gault estimates of creatinine clearance (CrCl) were calculated preoperatively and at 3 months postoperatively. The primary outcome was change between preoperative and postoperative CrCl. Univariate and multivariate analyses controlling for age, sex, ischemia time, preoperative CrCl, co-morbid conditions namely diabetes mellitus, hypertension as well as estimated blood loss were performed to assess the effect on postoperative renal function as measure by change in CrCl.
Results: Mean patients' age was 59.3 years. The overall baseline CrCl was 86.8 ml/s (82.9 and 95.4 ml/s for the open and the laparoscopic approaches respectively). Overall mean tumour size was 2.7 cm (open = 2.8 cm and laparoscopic = 2.5 cm, *p*-valu e= 0.16). Overall mean ischemia time was 32.7 minutes. Mean ischemia time was 35.4 and 26.6 minutes for the open and laparoscopic approaches respectively ($p < 0.0001$). Mean change in CrCl was 7.4 ml/s for patients who had open partial nephrectomy and 3.2 ml/s for those who had laparoscopic partial nephrectomy. In both univariate and multivariate analyses, change in CrCl was significantly affected by ischemia time ($p = 0.01$ and 0.04 respectively), and baseline CrCl ($p = 0.001$ and 0.0004 respectively). The surgical approach (open vs. laparoscopic) was not a significant pre-

Table 3. UP043. Perioperative patient laboratory values

Patient	Pre-op Hgb	POD #1 Hgb	Post-op Hgb nadir	Pre-op Cr	Cr POD #1	Post-op Cr Nadir
1	159	123	123	88	123	112
2*	149	114	107	109	121	107
3	140	125	121	115	124	91

* = solitary kidney.

dictor in univariate or multivariate analysis (p-value = 0.06 and 0.14 respectively).

Conclusions: The surgical approach of partial nephrectomy, laparoscopic or open does not significantly affect change in postoperative renal function measured by CrCl. As all patients treated with open partial nephrectomy underwent cold ischemia whereas all laparoscopic treated patients had warm ischemia these results also suggest similar renal function preservation with both ischemic modalities. The strongest predictors affecting the change in postoperative renal function are ischemia time and preoperative renal function. Randomized trials comparing cold vs. warm ischemia are needed to evaluate their effect on postoperative renal function.

UP045

Two Surveillance Strategies for Renal Cell Carcinoma after Radical Nephrectomy in Canada: Cost Comparison Analysis

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Introduction and Objective: The costs of follow-up strategies in patients after radical nephrectomy for primary renal cell cancer (RCC) have not been evaluated. We compared the costs of two different surveillance strategies, the new Canadian Urological Association (CUA) Guidelines and the old strategy implemented in our institution.

Methods: With institutional ethics review, 75 patients who underwent radical nephrectomy for primary non-metastatic renal cancer were retrospectively reviewed. Patients were scheduled for follow-up at 3, 6, 12 months and then yearly until recurrence was detected or the 60 months mark was reached. During each visit patients underwent history, physical exam, laboratory testing (CBC, electrolytes, renal and liver panels), urinalysis, and chest x-ray. At the 6 month visit CT chest/abdomen/pelvis was performed for all patients. After 12 months a stage-based strategy of surveillance was implemented. For T1, no imaging was ordered unless symptoms were present. For T2/3, CT was considered at the 2 year mark or if symptoms were present. The estimated costs following the CUA guidelines and our old institutional protocol were compared.

Results: The distribution of our patients stage by stage was T1 41, T2 15, and T3 19 patients. Our mean follow up was 31.1 (± 20.4 SD) months. The overall and disease-free survival were 87.7% and 85.2%. Total medical costs were higher for our old Institutional surveillance strategy than the CUA guidelines ($181 861 vs. $135 054). For the complete follow-up of 75 patients a cost savings of $46 806 could have been achieved following the CUA guidelines (p = 0.0019). Of recurrences 6 out of 7 were detected by routine screening, only one recurrence was identified by symptoms. The cost per recurrence detected in our old protocol was $9812.92. The increased cost of our institution analysis was due to more visits with basic testing, symptomatic investigation, and follow-up of imaging tests. The cost attributable to these extra tests was a median of 15% (range of 0-59%).

Conclusions: Based on our results we endorse the new CUA surveillance strategy for RCC follow-up. Significant cost savings would be achieved by changing from our older follow-up strategies used at our institution.

UP046

Robotic Partial Nephrectomy: The Initial Experience at a Canadian Tertiary Care Centre

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Introduction and Objectives: The incidence of small renal masses (SRM) has risen dramatically over recent years secondarily to the increased use of modern imaging techniques. The partial nephrectomy has become the standard of care for SRM's in appropriately selected cases. Performing a laparoscopic partial nephrectomy is technically challenging with a lengthy learning curve and may have associated prolonged warm ischemic time. The use of robotic assistance may enhance surgical resection, reconstruction and decrease warm ischemic time in complex renal masses. We describe the first twelve patients treated by way of robotic assisted laparoscopic partial nephrectomy (RALPN) at a tertiary centre in Canada.

Methods: Patient records and databases were reviewed for the first twelve consecutive patients treated with RAPLN for SRM's. Patient demographics, tumour characteristics, intra-operative and postoperative data has been collected retrospectively.

Results: Mean patient age was forty-nine (s = 14.2). Median ASA and mean BMI were 2.1 (s = 0.67) and 30.4 kg/m^2(s = 0.58) respectively. Preoperatively four patients suffered from renal insufficiency and one patient had a solitary kidney. Mean tumour size was 2.73 cm (s = 1.28) in maximum diameter. 8/12 of tumours treated were right sided and 6/12 of masses were endophytic. Pathology revealed seven RCC clear cell carcinomas, three RCC papillary carcinomas, one oncocytoma and one angiomyolipoma. Mean operative time and warm ischemic time were 229 minutes (s = 96.6) and 24 minutes (s = 5.4) correspondingly. Intraoperative ultrasound was used in all twelve cases. Hilar control was obtained with use of a Satinsky clamp in 9/12 cases and laparoscopic bulldog clamps in 3/12 cases. One case was converted to open due to failed hilar control. Mean estimated blood loss was 365 ml (s=61.7). All cases had negative resection margins. Mean length of hospital stay was 3.3 days (s = 0.72). No postoperative complications occurred. Mean delta creatinine at 3 months postoperatively was 5% (± 8%) There has been no evidence of recurrence in all 12 cases. Follow up ranges from 5 to 21 months.

Conclusions: The robotic partial nephrectomy is a viable and successful alternative to open and laparoscopic nephrectomy in selected cases. The enhanced ergonomics, wrist emulating mobility and visualization allow for improved partial nephrectomy techniques. The robotic advantages must be weighed against its increased cost in order to determine its practicality versus more customary methods of treatment. Further studies and longer follow-up are required to substantiate the use of this new technology.

UP047

Personalized Management of Upper Urinary Tract Urothelial Carcinoma: The Effect of Age on Cancer-Specific Mortality

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Introduction and Objective: The prognostic significance of advanced age on cancer-specific mortality (CSM) after nephroureterectomy (NU) for invasive upper urinary tract urothelial cancer (UTUC) is controversial. We assessed the effect of advanced age on CSM after NU in a large population-based cohort.

Methods: We relied on 2824 patients, who were treated with NU for UTUC in 9 Surveillance, Epidemiology, and End Results registries, between 1988 and 2004. Using the most significant cut-off values, age was stratified into three strata: ≤59 years vs. 60 to 79 years vs. ≥80 years. Differences in the rates of CSM were assessed using cumulative incidence plots that account for other-cause mortality. Univariable and multivariable competing-risks regression models were used to assess the effect of age on CSM.

Results: The 5-year cumulative CSM rates were respectively 14.8, 19.6, and 23.6% for patients ≤59 years of age, 60 to 79 years of age, and ≥80 years of age (Gray, $p < 0.01$). After accounting for other-cause mortality, the 5-year OCM rates for the same age groups were respectively 14.7, 28,4, and 47.5% (Gray, $p \leq 0.001$). Advanced age reached independent predictor status of CSM in competing-risks regression analyses ($p \leq 0.045$).

Conclusions: Advanced age was found to be an independent predictor of CSM after NU, even after controlling for the potentially confounding effect of other-cause mortality. In consequence, the deleterious effect of advanced age that may be related to postponed surgery should be considered in clinical decision-making.

UP048

The Impact on Renal Function after Partial or Radical Nephrectomy for Renal Cell Carcinoma: A Systematic Review

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Introduction and Objective: The impetus to perform partial nephrectomy (PN), or nephron-sparing surgery, for renal cell carcinoma (RCC) has increased in the past decade from strictly patients with imperative indications for the surgery, such as the presence of a solitary kidney or bilateral tumours, to include those with a normal contralateral kidney (elective indication). This has been largely due to the early detection of incidental small renal lesions and better surgical techniques that achieve satisfactory cancer outcomes and minimize peri-operative morbidity, with results similar to radical nephrectomy (RN). We further explored the potential benefits of this surgery by conducting a systematic review on the impact of PN on postoperative renal function in comparison to RN.

Methods: We searched MEDLINE for all relevant articles published up to July 31, 2008. We included all randomized-controlled trials (RCTs), cohort studies, and case-based studies that were published in English or French and compared outcomes for PN or RN, specifically postoperative renal function. Two independent reviewers abstracted relevant data and performed quality assessments on each selected study. We compared pre- and postoperative renal function, as a measure of changes in serum creatinine, estimated glomerular filtration rate (eGFR), creatinine clearance (CrCl), or need for dialysis for both PN and RN groups.

Results: We identified 210 unique citations, of which 16 cohort studies (1 prospective, 15 retrospective) met our inclusion criteria. Studies were grouped and compared according to the indication for performing PN—imperative (1 study), elective (8 studies), or a mixture of both (7 studies). All 8 elective studies showed no difference in postoperative renal function in patients undergoing PN, and a significant worsening of renal function in the RN group. Furthermore, postoperative complications and cancer-related morbidity and survival outcomes were similar in both groups, although study durations were relatively short.

Conclusions: PN appears to better-preserve postoperative renal function compared to RN for small renal tumours, while maintaining similar surgical and cancer-specific outcomes. Whenever feasible, a nephron-sparing approach should be utilized to minimize any future progression to chronic renal insufficiency.

UP049

Renal Function Outcomes Following Radical and Partial Nephrectomy: Early Results from The Alberta Urology Institute Radical Nephrectomy Database

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Introduction and Objective: Extirpative surgery is the gold standard treatment for renal cell carcinoma. Surgical options for patients include radical and partial nephrectomy, by both open and laparoscopic approaches. Recent data has shown that postoperative renal function is an important predictor of overall survival following both radical and partial nephrectomy, particularly for early stage tumours. The aim of our study was to analyze our centre's experience with radical and partial nephrectomy with respect to postoperative renal function outcomes.

Methods: The Alberta Urology Institute Nephrectomy Database is a comprehensive single institution database which aims to collect demographic, oncologic, renal function, surgical, and survival outcomes for patients who receive surgical therapy for renal cell carcinoma. A total of 281 patients charts from 2001 to 2009 have been abstracted thus far and entered into the database.

Results: There were 281 patients analyzed, comprising 126 radical and 151 partial nephrectomies. There were147 patients who had T1a lesions, 82 T1b, 45 T2, and the remaining 8 T3-T4. In the T1a group, there was no significant difference in mean GFR change between radical and partial nephrectomy groups. Twenty-two patients (15%) received radical nephrectomy, and 125 (85%) received partial nephrectomy. In the radical nephrectomy group, 11 patients (50%) with previously normal GFR developed a GFR between 30–60 mL/min, compared to 31(25%) in the partial nephrectomy group ($p < 0.01$). The odds ratio for developing renal dysfunction following radical nephrectomy in this group was 4.7 (95% CI = 1.8–11.9). In the T1b group, 52 patients received radical nephrectomy, compared to 29 who received partial nephrectomy. There was no significant difference between development of renal insufficiency in these two groups, which likely attributes to a higher proportion of patients in the partial nephrectomy group having baseline renal impairment compared to those receiving radical nephrectomy (20% vs. 5%). Fifteen patients (33%) in the T2 group developed new renal insufficiency. Five mortalities were noted in this cohort at mean 2.6 years follow up, 3 of which were specific to renal cell carcinoma.

Conclusion: In the therapy of early stage renal cell carcinoma, particularly for T1a lesions, radical nephrectomy is a significant predictor of renal insufficiency. Our data is consistent with others, but will require further maturation for analysis of overall and cancer specific survival. Hopefully a National Data will be able to determine the cut-point for recommending partial vs. radical nephrectomy. These early results stress the importance of partial nephrectomy in the treatment of these lesions for preservation of renal function.

UP050

Renal Cell Carcinoma in the Native and Allograft Kidneys of Renal Transplant Recipients: Incidence, Pathology and Outcomes

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Introduction and Objective: The incidence of renal cell carcinoma (RCC) in renal transplant recipients has been estimated at 30 or more times that seen in the general population. This study was undertaken to assess the prevalence of RCC in a large single-center recipient population, and to determine the histologic class and outcomes of these tumours and patients.

Methods: We examined the outcomes of patients undergoing renal transplantation at our institution between 1975 and 2008 to determine the incidence of renal masses occurring in the native and allograft kidneys of the recipients. Tumour histology was determined, and the follow up and outcomes of the patients were assessed. Surveillance imaging was performed with ultrasound evaluation of the allograft and native kidneys.

Results: There were 2626 patients who received a cadaveric (n = 1866) or living-related (n = 769) renal allograft. Thirty-two renal masses were diagnosed in the native kidneys of 27 patients (1.0%; male = 21, female = 11), and 6 tumours were found in renal allografts (0.2%; male = 5, female = 1). All tumours were discovered incidentally. Mean age at diagnosis was 50.8 years for native kidney tumours and 49.2 years for allograft tumours. Mean duration of dialysis prior to transplantation was 4.2 years, and mean interval between transplantation and RCC diagnosis was 9.6 years in native kidneys (range 0.6-29.3 years) and 10.0 years for transplant kidneys (range 0.8-22.1 years). Mean diameter of the masses in native kidneys was 3.07cm (range 0.5-8.0cm). Clear cell carcinoma was the most common histology (n = 17) followed by papillary RCC, which was diagnosed in 13 cases (11 type 1, and 2 type 2). There was one chromophobe RCC and one tubulocystic carcinoma. In allograft kidneys, 3 clear cell RCC and 3 papillary RCC were diagnosed. Univariate analysis did not find any variable to be predictive in determining pathology. Native kidney tumours were managed with radical nephrectomy by an open (n = 18) or laparoscopic (n = 14) approach, while allograft tumours were managed by nephrectomy (n = 2), partial nephrectomy (n = 2) or radiofrequency ablation (n = 2). At a mean follow-up of 5.1 years following native nephrectomy, 21 patients are alive, one of whom has metastatic RCC. Three patients have died from non-cancer causes and 3 patients have been lost to follow up. Five patients with allograft tumours are alive at a mean of 5.5 years post-treatment, and one is lost to follow-up.

Conclusions: Renal cell carcinoma is more common in patients with end-stage renal dysfunction and renal transplantation. Routine screening imaging can identify suspicious masses, which most commonly represent RCC,

though the pattern of subtype differs from the general population. Survival rates are good at 5 years following diagnosis and management.

UP051

The Prognostic Significance of a Positive Renal Vein Resection Margin in Patients with Renal Cell Carcinoma

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Introduction and Objective: Surgical resection is the optimal curative treatment for localized renal cell carcinoma (RCC). Although RCC invades the venous system in 4–9% of newly diagnosed patients, there is little published data on the prognostic significance of a positive renal vein resection margin following radical nephrectomy. We present an analysis of RCC patients with renal vein invasion at Vancouver General Hospital (VGH) within the last 10 years and the impact of renal vein resection margin status on disease specific survival.

Materials and Methods: Patients who were treated with radical nephrectomy for renal vein invasive RCC were identified in the VGH pathology database. Data on clinical outcomes, demographics, pathological features and clinical staging of these patients was analyzed and used to compare outcomes between those with positive and negative resection margins.

Results: Of 157 patients treated with radical nephrectomy for RCC between 1998 and 2008, 20 (13%) had invasion of the renal vein; 5 of these had a positive renal vein resection margin. Disease specific survival at 5 years was significantly worse in patients with positive renal vein resection margins ($p = 0.03$). Of the 5 patients with positive margins, 2 had distant metastases at diagnosis and 2 developed distant metastases during follow-up. All positive margins patients died of their disease within 5 years of nephrectomy. Of the 15 patients with a negative renal vein resection margin, 1 had distant metastases at diagnosis and 2 developed metastasis during follow-up. These patients died of their disease within 5 years of nephrectomy, one further patient died of local recurrent greater than 5 years after nephrectomy. Eight patients with negative margins were disease free after an average follow-up of 59.5 months.

Conclusion: For RCC patients with pT3b/c disease, a positive renal vein resection margin is a dire prognostic indicator. The experience at this institution reveals that these patients have very poor outcomes whether or not there is local tumour invasion or nodal involvement. Complete resection achieving negative renal vein margins is essential to provide the best chance of long-term, disease-free survival.

UP052

A Comparison of Laparoscopic and Percutaneous Radiofrequency Ablation for the Treatment of the Small Renal Mass

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Introduction and Objective: While the relative merits of laparoscopic and image-guided percutaneous approaches to renal radiofrequency ablation (RFA) have been defined and debated, there is scant data directly comparing their relative clinical efficacy, durability, and safety. The purpose of this study is to compare the outcomes of our single-centre experience with laparoscopic and percutaneous renal RFA.

Methods: A retrospective chart review encompassing 34 tumours in 30 patients was conducted. Twenty-one tumours (62%) were ablated laparoscopically, while 13 tumours (38%) were ablated percutaneously using CT guidance. Renal biopsies were performed in all but 4 tumours, and all ablations were performed using RITA probes. Cross-sectional imaging (CT or MRI) was performed six weeks post-ablation and at 6 to 12-month intervals thereafter. Statistical comparisons were performed using Student's t-test and Fisher's exact test.

Results: The laparoscopic and percutaneous groups were similar in their preoperative and tumour characteristics. Mean patient age in the laparoscopic and percutaneous groups were 64.3 and 64.1 years, respectively, and mean tumour size was 2.3 cm and 2.7 cm, respectively. Laparoscopic ablations did include more ablation cycles than percutaneous ablations (2.9 vs. 2.1, $p = 0.007$). All three incomplete ablations occurred in patients treated percutaneously, yielding a primary efficacy rate of 77% in the percutaneous group and 100% in the laparoscopic group ($p = 0.05$). At a median follow-up time of 27 months, there was one recurrence in the laparoscopic group (5%) and none in the percutaneous group (p = NS). Length of hospital stay and change in GFR were not significantly different between the groups. Two major complications, a urine leak and ureteropelvic junction obstruction, were encountered, with both complications occurring in patients treated laparoscopically (p = NS).

Conclusions: In our series comparing laparoscopic and percutaneous RFA, the percutaneous approach yielded a higher rate of incomplete ablation, a finding that likely reflects less aggressive probe repositioning and fewer ablation cycles. The clinical significance of this finding on long-term oncologic outcomes is yet to be determined. Conversely, laparoscopic RFA was associated with the two major complications encountered in this series. These issues of relative safety and efficacy must be carefully balanced when choosing a RFA approach.

UP053

Utilization Rates of Open Partial Nephrectomy and Laparoscopic Radical Nephrectomy in Patients with Non-Metastatic Renal Cell Carcinoma

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Introduction and Objectives: Open nephrectomy (OPN) and laparoscopic radical nephrectomy (LRN) may be underutilized. We explored the rates of the two surgeries relative to open radical nephrectomy (ORN) in a large population-based database.

Methods: Between 1998 and 2008, a total of 17690 nephrectomies for non-metastatic renal cell carcinoma were performed in the state of Florida. Of these, 2528 (14.3%, 1379 (7.8%) and 13783 (77.9%) respectively represented OPN, LRN, and ORN. We examined the proportion of patients who underwent an OPN, LRN, and ORN throughout the study period. Multivariable logistic regression analyses addressed predictors of either OPN or LRN after adjusting for patient age, gender, race, Charlson comorbidity index, insurance type, and year of surgery.

Results: Overall, the rate of OPN increased from 8.1 to 18.7% over the study period vs. from 0.2 to 12.3% for LRN (chi-square trend: $p < 0.001$). OPN and LRN rates ranged respectively from 9.6 to 25.1% and from 0.3 to 12.2% in individuals <60 years old from 6.4 to 12.7% and from 0.4 to 13.5% in individuals >70 years old. Similarly, OPN and LRN rates ranged from 13.0 to 24.2% and from 0.3 to 11.7% in the highest annual hospital volume tertile vs. 4.7 to 14.7% and from 0.2 to 10.4% in the lowest annual hospital analyses, high hospital volume and high surgical volume were independent predictors of the use of OPN and the use of LRN ($p < 0.001$).

Conclusions: OPN and LRN are performed significantly less frequently than ORN. Both hospital and surgical volume represented important determinants of OPN and LRN use. This implies that the likelihood of being treated with either OPN or LRN is the highest when the surgery is performed at high volume centres and by high volume surgeons.

UP054

A Population-based Analysis of Perioperative Complications and Mortality Associated with Cytoreductive Nephrectomy for Metastatic Renal Cell Carcinoma

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Introduction and Objective: Cytoreductive nephrectomy (CNT) may improve survival of patients with metastatic renal cell carcinoma (mRCC). However, it may be associated with higher morbidity and mortality rates relative to nephrectomy in non-mRCC patients. We assessed the peri-

operative outcomes of CNT in patients with mRCC and compare these to outcomes of individuals who underwent a nephrectomy for non-mRCC in a large population-based dataset.
Methods: Between 1988 and 2008, 1985 and 27037 patients underwent a nephrectomy for respectively mRCC and non-mRCC using the Florida database. We examined patient characteristics, complications and perioperative mortality rates of patients with mRCC who underwent a CNT and we compared those with the characteristics and outcomes of individuals with non-mRCC.
Results: Relative to non-mRCC individuals, a larger proportion of mRCC patients were males (67.9 vs. 61.6%; $p < 0.001$) and represented emergency admissions (27.5 vs. 19.4%; $p < 0.001$). Length of stay was statistically significantly longer in patients with mRCC relative to their non-mRCC counterparts (9.5 vs. 6.7 days; $p < 0.001$. The overall complication rate was also higher in mRCC patients (29.6 vs. 22.8%; $p < 0.001$). Specifically, the rates of accidental intraoperative lacerations (5.6 vs. 3.6%; $p < 0.001$), postoperative cardiac complications (4. Vs. 2.4%; $p < 0.001$), vascular complications (2.5 vs. 0.8%; $p < 0.001$), respiratory complications (8.4 vs. 6.4%; $p = 0.001$), hemorrhage (2.6 vs. 1.4%; $p = 0.02$) were higher in patients with mRCC. Perioperative in-hospital mortality rate was also higher in mRCC patients (3.0 vs. 1.2%; $p < 0.001$). In multivariable logistic regression models, after adjusting for patient age, gender, race, insurance type, average annual surgical and hospital volume, mRCC was a statistically significant predictor of any complication type (OR: 2.7 [95% CI: 2.0–35]; $p < 0.001$), and predicted higher perioperative mortality (OR: 1.4 [95%CI: 1.3–1.6]; $p < 0.001$).
Conclusions: Nephrectomy in individuals with mRCC is associated with higher complication and perioperative mortality rates relative to nephrectomy performed in patients with non-mRCC. This information should be included in informed consent. Moreover, careful patient selection is critical to minimize morbidity and mortality after CNT.

UP055

Tumour Size is Associated with the Rate of Synchronous Metastases in Patients with Small Renal Cell Tumours

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Introduction and Objective: Small renal masses between 1.1 and 4.0 cm can be visualized and confirmed histologically with a high degree of certainty. We examined the rate of synchronous metastases (SM) in patients with renal cell carcinoma (RCC) 1.1 to 4.0 cm in size within a large population-based tumour registry.
Methods: We tested the relationship between tumour size and SM in a population of 27 780 patients with small renal masses diagnosed and/or treated with nephrectomy for histologically-proven RCC within 17 SEER registries between 1988 and 2006. Cubic spline analyses and logistic regression models were used to test this relationship after adjusting for other covariables, such as age, gender, race, RCC histological subtype and year of diagnosis.
Results: Within the study population the rate of SM was 4.5%. Stratification according to 1 cm tumour size intervals revealed that the SM rate increased with increasing tumour size: 1.1–2.0 cm: 3.1%; 2.1–3.0 cm: 4.0%; 3.1–4.0 cm: 5.7% (χ^2 trend; $p < 0.001$). Cubic spline analysis showed that rate of SM is starts to increase exponentially when tumour size exceeds 2.5 centimeters. Continuously coded tumour size represented an independent predictor of SM in multivariate regression models (OR: 1.04; $p < 0.001$). When tumour size was divided into 1 cm intervals, patients with 2.1–3.0 and with 3.1–4.0 cm RCCs had respectively a 1.2- and a 1.7-fold higher risk of harboring SM ($p \leq 0.05$). Finally, advanced age ($p < 0.001$), male gender ($p < 0.001$), African-American race ($p = 0.03$) and more contemporary year of diagnosis ($p = 0.02$) also represented independent predictors of SM.
Conclusions: Tumour size is related to SM rate even in patients with small (1.1 to 4.0) RCCs. The rate of SM increases exponentially when tumour size exceeds 2.5 cm. Conversely, no differences in metastatic rates were observed below this threshold.

UP056

Percutaneous Radiofrequency Ablation of Small Renal Tumours: Initial Experience

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Introduction and Objective: Although surgical resection is still the gold standard therapy for localized renal tumours, patients with multiple bilateral tumours and/or significant comorbidities present a clinical challenge. Percutaneous radio frequency ablation (RFA) provides an alternative to minimize morbidity in selected patient cohort. The goal of the current study was to evaluate the role of RFA in the management of renal tumours in an academic centre.
Methods: A retrospective chart review of all renal tumour patients treated with RFA was performed. Patients were followed with CT and/or MRI according to their renal function. Procedure success was assessed by the absence of tumour enhancement and progression on imaging.
Results: From 2005, a total of 27 patients (19 males and 8 females) with 32 renal tumours underwent CT guided RFA under general anesthesia by a single operator. Median tumour size was 2.8 cm (mean 3.1, range: 1.4 – 5.4 cm). Five patients required a 2nd RFA procedure. Patients received from 1 to 5 ablations per tumour. Median age was 72 years (range 39–95). All patients had either solitary kidney, bilateral disease or considered unfit for surgery due to significant comorbidities. Mean patient follow-up was 2.7 years. Post-RFA complications were; minor bleeding and hematoma (n = 5), no response and nephrectomy (n = 1), residual tumours (n = 2), recurrent tumour (n = 1), worsening renal functions (n = 2) of which one required permanent dialysis, pneumothorax (n = 2), splenic injury (n=1), hepatic puncture (n = 1), duodenal fistula (n = 1), urinoma (n = 2), perirenal abscess and emphysematous pyelonephritis (n = 1), renal cortical infarction (n = 1), deep cutaneous burn (n = 1), wrist drop (n = 1) and psoas injury (n = 1).
Conclusions: Even though RFA can be a reasonable successful alternative management modality for a selected patient cohort with renal tumours, it can still carry a significant risk for serious complications.

UP057

Evolving Tumour Characteristics and Practice Patterns in a Contemporary Canadian Tertiary-Care Institution

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Introduction and Objective: There is increasing evidence that partial nephrectomy improves outcome in terms of renal function and overall survival. Our study objective was to determine if practice patterns in a contemporary population had evolved to reflect this finding.
Methods: Between 2001 and 2009, 363 patients underwent surgical excision of a renal mass at a single tertiary-care centre. A retrospective analysis was conducted to assess patient demographics, tumour characteristics and surgical management during this period. Odds ratios and 95% confidence intervals were calculated per year increase for clinical stage ≥2, female gender, malignancy, tumour size >4, lap surgery, partial surgery, as well as partial surgery within open and lap access separately.
Results: The average patient age decreased from 65.2 ± 13.8 in 2001-03 to 59.8 ± 12.5 in 2008–09 (-0.77 SE(0.37), $p = 0.035$) with a significant increase in the proportion of female patients (odds ratio 1.82 (1.54, 2.15), $p < 0.05$). The incidence of benign tumours increased from 7.8% in 2001–03 to 23.2% in 2008–09 for an odds ratio of 0.79 (0.67, 0.94, $p < 0.05$), while clinical stage remained unchanged (odds ratio 1.02, 95% CI (0.89, 1.17). The incidence of partial nephrectomy as the surgery of choice increased from 33.3% in 2001–03 to 49.3% in 2008-09 (odds ratio 1.19 (1.05, 1.35, $p < 0.05$) despite the average tumour size remaining unchanged (0.067 SE(0.11), $p = 0.56$, 4.94 ± 3.3 in 2001–03 and 5.33 ± 4.3 in 2008–09). Between 2001–03 and 2008–09, partials increased from 33.3% to 57.6% amongst patients undergoing open sur-

gery and from 0% to 41.7% amongst patients undergoing laparoscopic surgery. Surgical access evolved from 100% open approach in 2001-3 to 52.2% performed laparoscopically in 2008–09 (odds ratio 1.82 (1.54, 2.15), $p < 0.05$).

Conclusions: We noted a significant decrease in patient age during the study period, which may be secondary to earlier detection in addition to increased utilization of active surveillance and ablative therapies in older patients. There was a significantly increased employment of partial nephrectomy, via open and laparoscopic approach, despite tumour size remaining unchanged. This lack of size difference was unexpected but potentially due to the nature of referrals to a tertiary-care centre. The increased likelihood of benign disease reinforces the need for nephron-sparing approaches.

UP058

Localized T1a Renal Lesions in the Elderly: Outcomes of Laparoscopic Renal Surgery

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Introduction and Objective: To compare outcomes of patients ≥70 years of age undergoing laparoscopic partial nephrectomy (LPN), laparoscopic radical nephrectomy (LRN) and laparoscopic ablative therapy (LAT) for small renal masses.

Methods: From a prospectively maintained database we identified 19 (LRN), 28 (LPN), and 19 (LAT) patients aged ≥70 who underwent surgery for cT1aN0M0 lesions. Perioperative, surgical and functional outcomes were compared.

Results: The 3 groups were similar in age, race, BMI, and estimated creatinine clearance (eCrCl). In the LRN group, mean tumour diameter was larger (3.3 cm vs. 2.4 cm (LPN) and 2.7 cm (LAT); $p = 0.0005$) and there was a higher percentage of central tumours (73.7% vs. 25.0% and 5.3 %; $p < 0.0005$) when compared to the LPN and LAT groups, respectively. Although intra-operative and postoperative complication rates were similar, mean estimated blood loss and operative time were highest in the LPN group ($p < 0.05$). Moreover, 42.1%, 39.3% and 42.1% of patients had preoperative stage 3 chronic kidney disease (CKD) in the LRN, LPN and LAT groups, respectively. Patients who underwent LRN had a lower follow-up eCrCl (43.4 mL/min vs. 61.4 (LPN) and 59.2 (LAT); $p < 0.01$) and a higher likelihood of developing stage 3 CKD after treatment (100% vs. 25.0 (LPN) vs. 18.2 (LAT); $p < 0.0005$).

Conclusions: Impaired renal function is common in elderly patients presenting with renal masses. LPN and LAT provide superior preservation of renal function when compared to LRN in this population. In appropriately selected patients ≥70 years of age presenting with T1a renal lesions, laparoscopic nephron-sparing approaches should be considered.

UP059

Lymph Node Yield and Number of Positive Lymph Nodes After RPLND Does not Predict Cancer-Specific Survival in Patients with Nonseminomatous Germ Cell Tumours of the Testis

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Introduction and Objective: There is much debate as to the prognostic significance of lymph node yield and positive number of lymph nodes within a retroperitoneal lymph node dissection (RPLND) specimen. We examined the effect of number of lymph node removed and examined and number of positive lymph nodes on cancer specific mortality within a population-based cohort of patients with nonseminomatous germ cell testicular tumours (NSGCTT).

Materials and Methods: Between 1988 and 2006, 1919 RPLNDs were performed within 17 Surveillance, Epidemiology and End Results (SEER) registries. Of these, 1024 (53.4%) were performed for stage I and 895 (46.6%) were performed for stage II NSGCTT. Univariable and multivariable Cox regression models tested the prognostic impact of either number of removed/examined lymph nodes or number of positive lymph nodes on cancer specific mortality. Analyses were adjusted for age, race (white, black, other), year of surgery (1988–1992, 1993–1997, 1998–2002, 2003–2006), socio-economic status (low vs. high) SEER stage (I vs. II) and SEER registry.

Results: The mean number of lymph nodes removed/examined was 21.9 (range: 1-96). The mean positive nodes were 1.6 (range:0–56) across all stages. The mean number of lymph nodes removed/examined and of positive lymph nodes were 21.3 and 22.6 vs. 0 and 3.4 for respective stages I and II NSGCTT. In univariable and multivariable Cox regression analyses neither number of lymph nodes removed/examined ($p = 0.6$, $p = 0.8$) nor number of positive lymph nodes ($p = 0.7$, $p = 0.2$) were able to reach independent predictor status for cancer-specific mortality. Among covariates the only variable that was an independent predictor of cancer specific survival was advanced age ($p = 0.001$).

Conclusion: Cancer-specific mortality does not seem to be influenced by the number of nodes in the surgical specimen or the number of positive lymph nodes across stages I and II NSGCTT.

UP060

Specific Population-Based Trends of RPLND Use

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Introduction and Objective: No data are available regarding the use of retroperitoneal lymph node dissection (RPLND) across all stages of nonseminomatous germ cell testicular tumours (NSGCTT) in the community. We examined the rates of RPLND use in this patient subset in a large population-based cohort.

Materials and Methods: Between 1988 and 2006, 9633 patients with NSGCTT were treated with or without an RPLND within 17 Surveillance, Epidemiology and End Results (SEER) registries. Analyses focused on annual trends (1988–1992, 1993–1997, 1998–2002, 2003–2006) and univariable and multivariable logistic regression models, stratified according to disease stage. Analyses were adjusted for patient age, race (white, black, other), socio-economic status (low vs. high) and SEER region.

Results: Overall 2620 (27.2%) of 9633 NSGCTT patients underwent an RPLND (1988–1992: 34.7%, 1993–1997: 29.5%, 1998–2002: 27.6%, 2003–2006: 22.2%; X^2 trend $p < 0.001$). In patients with stage I NSGCTT, the overall rate of RPLND was 22.4% (1988–1992: 18.4%, 1993–1997: 23.5%, 1998–2002: 32.4%, 2003–2006: 25.7%; X^2 trend $p < 0.001$). In patients with stage II NSGCTT the rate of RPLND was 50.1% (1988–1992: 20.9%, 1993–1997: 18.5%, 1998–2002: 31.8%, 2003–2006: 28.8%; X^2 trend $p = 0.003$). Finally in patients with stage III NSGCTT the overall rate of RPLND was 13.1% (1988–1992: 15.0%, 1993–1997: 19.0%, 1998–2002: 32.3%, 2003–2006: 33.6%; X^2 trend $p = 0.983$). In multivariable logistic regression models that focused on stage I patients, year of surgery ($p < 0.001$) and SEER registry ($p < 0.001$) represented independent predictors of RPLND. In patients with stage II, year of surgery ($p = 0.01$) remained an independent predictor of RPLND.

Conclusion: Population-based trends indicate a decreasing rate of RPLND use. This decrease is most apparent in stage I patients where a 55.1% drop was recorded. It may be attributable to wider use of surveillance and/or chemotherapy. Less pronounced decrease was also recorded in stage II patients (19.1% drop) and is attributable to the wider use of chemotherapy as monotherapy. The RPLND rates did not change for stage III patients.

UP061

Decreased Survival of African Americans with Testicular Cancer: A Contemporary Population-Based Analysis

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Introduction and Objective: A previous report (Journal Urology; Bridges P, Sharif R, Razzaq A, Guinan P; 1998) indicated that African Americans have worse survival after the diagnosis of testicular cancer (TC) than their white counterparts. We re-examined the association between race and survival in a large population-based dataset.

Materials and Methods: Between 1998 and 2006, 24 388 men were diagnosed and treated for all stages of TC (Seminoma, Non-Seminoma and other testicular malignancies). Analyses focused on the association between African Amercian race and overall mortality, and consisted of univariable and multivariable Cox Regression models. Analyses were adjusted for age, year of diagnosis (1988–1995, 1996–2000, 2001–2003, 2004–2006), socio-economic status (low, high), histological subtype (Seminoma, Non-seminoma, Other) type of intervention (orchiectomy, orchiectomy and RPLND, RPLND, no-Intervention), clinical stage (localized, regional, distant) and SEER registry.

Results: Of 24 388 patients with TC, 616 (2.5%) were African Americans. Of those, 379 (61.5%) had localized TC, 130 (21.1%) had regional TC and 107 (17.4%) had distant TC. In patients with localized disease, African American race was associated with a 1.66-fold increase in overall mortality, which did not reach independent predictor status in multivariable analyses (HR:1.49; p-value = 0.1) compared to White Americans. Conversely, in patients with regional disease, the increase in overall mortality associated with African American race was 2.57-fold (p-value <0.001) in univariable analyses and remained at 2.44-fold ($p < 0.001$) in multivariable models relative to White Americans. For African American patients with distant metastatic disease the univariable and multivariable increases in overall mortality were respectively; 1.80 (p-value < 0.001) and 1.69-fold (p-value=0.001) relative to White Americans.

Conclusions: Overall mortality rate is 2.44 and 1.69-fold higher in respectively regional and distant disease in African American patients with TC. This disparity in overall mortality rate relative to White Amercian patients with TC deserves attention.

UP062

A Nomogram for Prediction of Cancer-Specific Mortality in Patients Treated with Surgery for Primary Penile Squamous Cell Carcinoma

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Introduction and Objectives: Cancer-specific mortality (CSM) of patients with primary penile squamous cell carcinoma (PPSCC) may be quite variable. We attempted to develop a model to predict CSM after surgical removal of PPSCC.

Material and Methods: The predictive tool was developed on a cohort of 1978 patients identified in the 1988 to 2006 Surveillance, Epidemiology and End Results (SEER) database. The predictors consisted of age, race, TNM stage, tumour grade and type of surgery (local tumour excision, partial penectomy, and radical penectomy). Cox regression model-derived coefficients were used for prediction of 5-year CSM. The predictive accuracy was tested using the Harrell's modification of the area under the receiver operating characteristics curve.

Results: T stage ($p = 0.009$), N stage ($p < 0.001$), M stage ($p < 0.001$), histologic grade ($p < 0.001$) and type of surgery ($p < 0.001$) achieved independent predictor status and qualified for inclusion in the model. The model achieved 75.2% accuracy for prediction of CSM at 5 years after surgery.

Conclusions: Our population-based model corroborates the importance of TMN staging and grading for prognostication. Moreover, we were able to devise a 75.2% accurate nomogram predicting 5-year CSM in patients with PPSCC.

UP063

Does Androgen Deprivation Therapy Increase the Risk of Falls in Older Men with Prostate Cancer?

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Introduction and Objective: Androgen deprivation therapy (ADT) is a common treatment for prostate cancer (PC). ADT may increase the risk of falls due to decreases in testosterone, lean body mass & strength. Falls are a leading cause of morbidity and mortality in older adults. However, the impact of ADT on falls remains unclear.

Methods: Three groups matched on age and education were recruited: PC patients starting continuous ADT (ADT users) (n = 88), PC patients not receiving ADT (PC controls) (n = 86), and healthy controls (n = 86). All PC patients had non-metastatic disease. Patients retrospectively reported any falls in the 12 months prior to study entry and prospectively at 3 time points over the next 12 months (after starting ADT). Physical performance measures were done at each time point. The risks of having a fall at both baseline and over one year of follow-up were analyzed using logistic regression.

Result: Subjects had a mean age of 69 (range 50-87). At baseline 13.8% (n = 36) of subjects (ADT users=13.8 %, PC controls=8.1%, healthy controls=18.6%, $p = 0.132$) reported at least one fall in the prior year. In the multivariable model, timed up and go test performance, being unmarried, and working status predicted falls risk at baseline. Over 12 months, 24.8% (n = 62) of subjects (ADT users=34.5%, PC controls=18.1%, healthy controls=21.7%, $p = 0.035$) reported at least one fall. A prior history of falls ($p = <0.001$), being unmarried ($p = 0.014$), and arthritis ($p = 0.009$) were independent predictors of falls in multivariable models whereas ADT use was borderline ($p = 0.08$). Age was not an independent predictor of falls ($p = 0.227$).

Conclusion: ADT use may be associated with an increased risk of falls, but larger confirmatory studies are needed. Additionally, multiple non-physical factors including a prior history of falls and arthritis predict future falls in older men on ADT.

UP064

The Application of 18f-Fluorodeoxyglucose Positron Emission Tomography in Prostate Cancer After Initial Therapy

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Introduction and Objectives: Prostate cancer is a problem in men. The aim of this study was the post-treatment assessment of prostate cancer patients by ^{18}Flourine-fluorodeoxyglucose positron emission tomography (^{18}F-FDG PET) for local recurrence and distant metastasis.

Methods: Thirty patients with proved adenocarcinoma of the prostate were evaluated within 24 ms (mean:15 ms) after initial treatment by serum total prostate specific antigen (t-PSA), chest -abdomino-pelvic computerized tomography (CT), bone scintigraphy and ^{18}F-FDG PET.

Results: Of the 13 patients who underwent radical prostatectomy, local recurrence was diagnosed by pelvic CT, FDG-PET in 4 cases, with mean standardized uptake value (SUV), calculated by FDG-PET, (3.1). Transrectal ultrasonography (TRUS) guided needle biopsies confirmed these recurrences. Para aortic and/ or pelvic lymph node metastases were detected in 10/30 cases by abdomino-pelvic CT, FDG-PET, with mean SUV (4.7), confirmed by CT guided needle biopsies in 3/10 patients. Bone scintigraphy, FDG-PET detected bone metastases in 18/30 cases, with mean

SUV (5.6). Lung metastases were diagnosed in 5/30 patients by chest CT, FDG-PET with mean SUV (4.5).
Conclusion: Conventional studies could be complemented by ^{18}F-FDG PET for diagnosis of local recurrence and distant metastases in cancer prostate.

UP065

Challenging the 10-year Rule: The Accuracy of Patient Life Expectancy Predictions by Physicians in Relation to Prostate Cancer Management

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Introduction and Objective: Our objective was to assess the ability of physicians to predict how long a patient has to live given their clinical presentation. In prostate cancer this is especially important since the decision to screen hinges upon this prediction. No previous studies have employed this power of response combined with the use of real cases and accompanying concrete end-points before.
Methods: We took seven charts of deceased patients and summarized clinical scenarios based on detailed clinical notes. We then recruited 100 respondents in the medical profession, including doctors, residents, and medical students, and asked them to use their clinical judgments in order to estimate how long each patient had left to live based on their clinical scenario. These responses were analyzed with respect to the patients' actual survival end-points, then stratified based on the demographic information provided.
Results: Data analysis showed that respondent factors such as sex, level of training, location of work, or specialty made no significant difference in how well respondents predicted life expectancy. In addition, we found that respondents are typically pessimistic in their estimations with a negative linear trend between estimated life expectancy and actual life expectancy as actual life expectancy increased. In evaluating the accuracy of life expectancy predictions overall, we found that only 15.9% of the time are physicians within 1 year of actual life expectancy and we are on average 67.35% inaccurate in relation to actual survival. If we were to examine this in terms of correctly identifying which patients would live more than or less than 10 years (dichotomous accuracy), we only answer correctly 68.30% of the time.
Conclusions: There is a clear trend among physicians to do very poorly on predicting life expectancy. Furthermore, physicians tend to underestimate how long patients have left to live. Finally, physicians' poor overall accuracy in deciding whether a patient has more or less than 10 years left to live raises the question if life expectancy calculators would be a useful adjunct to clinical judgment with respect to prostate cancer screening.

UP066

CUSUM's as a Quality Control Measure in Robot-Assisted Radical Prostatectomy

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Introduction and Objective: Robotic assisted laparoscopic radical prostatectomy (RALRP) is rapidly becoming the procedure of choice for the treatment of localized prostate cancer within North America. With the introduction of this new technology, new quality assurance methods must be introduced to make sure that surgical standards are maintained during a surgeon's transition from open surgery to robotic surgery. Cumulative summation (CUSUM) is a technique used within industry to monitor production lines and detect possible changes in production quality on a continuous basis. We wished to perform CUSUM analysis on a single surgeon series of RALRP during the start-up phase of a robotics program.
Methods: Patient data was prospectively collected from patients undergoing RARP by a single surgeon (SP) following UWO Health Science Research Ethics Board review and approval. All patients included were either low or moderate risk under the D'Amico classification system. Preoperative, intraoperative and postoperative features were recorded. Retrospectively, a CUSUM graph was performed to analyze the PSM rate in patients undergoing RARP for pT2 disease. Maximum and minimum acceptable PSM rates were set at 10% and 15% respectively.
Results: From the entire cohort of 226 patients, there were 158 patients with pathologic T2 disease (pT2), who formed the cohort for this study. Mean Patient age was 59.2 Years (39-73), Median Gleason Score was 6 (4–9), Mean PSA was 6.43 ng/ml (0.52–17.5) and mean prostate volume was 44cc (18cc–120cc). Of these 158 pT2 patients, 21 had PSM (13%). CUSUM graphs were produced and clearly demonstrated the change in PSM rate over time; at no stage did the CUSUM graph reach the unacceptable level. Gleason score and clinical T stage had no significant association with PSM's in this study and therefore adjusted CUSUM graphs were not required.
Conclusions: CUSUM graphs are a useful tool for a practicing urologist to monitor their surgical technique. Despite the literature describing PSM margin rates in T2 disease as low as 3%, rates are still significantly higher than this in multi-institutional and community studies which quote up to 36%. It is not feasible for high volume units to be the only centres performing radical prostatectomy procedures and we must therefore look at ways that surgeons can monitor and continually improve their own surgical procedures. This technique allows the surgeon to personally choose their own acceptable and unacceptable PSM limits and monitor their results accordingly for either monitoring their current technique or monitoring their learning curve of a new technique.

UP067

Does Body Mass Index (BMI) Affect the Clinical Outcomes of Robot-Assisted Laparoscopic Prostatectomy (RALP)?

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Introduction and Objective: With the 35% prevalence of obesity in the United States, a significant proportion of RALP candidates have an elevated BMI. We determine if this impacts on the surgical outcomes and morbidity of the procedure
Methods: Consecutive patients who underwent transperitoneal RALP (anterior approach) by a single surgeon (CW) were reviewed. Clinical outcomes and adverse events were prospectively recorded and analyzed in obese (I; BMI >30 kg/m^2), overweight (II; BMI 25–30 kg/m^2) and normal weight (III; BMI <25 kg/m^2).
Results: There were 166 patients identified [I: 49 (29.5%); II: 84 (50.6%); III: 33 (19.9%)]. The mean BMI were significantly different (I: 32.8 ± 2.7; II: 26.1 ± 3.4; III: 23.1 ± 1.6 kg/m^2, $p < 0.001$). There were no significant statistical differences in mean age (I: 61.7 ± 6.1; II: 62.2 ± 9.8; III: 62.4 ± 5.0 years), PSA (I: 5.5 ± 4.1; II: 6.3 ± 5.1; III: 6.1 ± 3.2 ng/mL), incidence of bladder neck reconstruction [I: 0 (0.0%); II: 1 (1.2%); III: 0 (0.0%)], estimated blood loss (I: 103.1 ± 50.0; II: 91.7 ± 41.3; III: 79.2 ± 23.4 mL), prostate volume (I: 41.5 ± 13.6; II: 42.4 ± 12.1; III: 44.4 ± 13.0 mL), positive surgical margins [I: 9 (18.4%); II: 17 (20.2%); III: 3 (13.6%)], hospitalization (I: 1.1 ± 0.6; II: 1.1 ± 0.3; III: 1.5 ± 2.2 days) and time to continence without pads (I: 9.8 ± 8.6; II: 9.7 ± 7.8; III: 9.5 ± 6.9 weeks). The median urethral catheter duration was similar in all groups (5.0 days). The operative time was shorter in group 3 compared to both groups 1 (I: 223.1 ± 59.0 vs. III: 190.8 ± 41.4 minutes, p = 0.010) and 2 (II: 213.6 ± 53.1 vs. III: 190.8 ± 41.4 minutes, p = 0.039). Adverse events included prolonged urine leak (>6 days) [I: 2 (4.1%); II: 2 (2.4%); III: 1 (3.0%)], ileus [I: 0 (0.0%); II: 1 (1.7%); III: 0 (0.0%)], pelvic hematoma [I: 1 (2.0%); II: 0 (0.0%); III: 1 (4.5%)], fascial dehiscence [I: 1 (2.0%); II: 0 (0.0%); III: 0 (0.0%)], 1 urinary tract infection [I: 0 (0.0%); II: 1 (1.7%); III: 0 (0.0%)], transient acute renal failure [I: 0 (0.0%); II: 1 (1.7%); III: 1 (4.5%)], deep vein thrombosis [I: 0 (0.0%); II: 2 (2.4%); III: 0 (0.0%)] and bladder neck contracture [I: 2 (4.1%); II: 2 (2.4%); III: 1 (3.0%)], none of which were significantly different between the 3 groups.
Conclusions: Elevated BMI appears to increase the operative time, but has little impact on blood loss, duration of hospitalization, clinical outcomes or patient morbidity in patients undergoing RALP.

UP068

Predictors of Hemoglobin Decline in Non-Metastatic Prostate Cancer Patients on Androgen Deprivation Therapy: A Matched Cohort Study

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Introduction and Objective: The extent and severity of hemoglobin decline in older men with prostate cancer (PC) on androgen deprivation therapy (ADT) are not well-characterized. Our objectives were to examine changes in hemoglobin level and predictors of hemoglobin decline in men starting ADT for at least 12 months.

Methods: We recruited 260 men in 3 cohorts: ADT users initiating continuous ADT, PC controls, and healthy controls, matched on age and education. All patients with PC had non-metastatic disease. Mean hemoglobin levels at baseline (n = 250), 12 months (n = 211) and change in hemoglobin (n = 204; 7 men with anemia at baseline (hemoglobin <120 g/L) were excluded) were calculated. To determine predictors of baseline and change in hemoglobin over time, we performed univariate and multivariable linear regression.

Results: We included 250 men (mean age 69 years). The baseline mean hemoglobin was 141 g/L in ADT users, 144 g/L in PC controls, and 149 g/L in healthy controls ($p = 0.001$). Seven men with anemia at baseline (hemoglobin < 120 g/L) were excluded. Over 12 months , the mean hemoglobin level declined in ADT users by 8.94 g/L, compared to 0.56 g/L and 2.03 g/L among PC controls and healthy controls, respectively ($p < 0.0001$). In multivariable linear regression, statistically significant predictors of lower hemoglobin levels at baseline were non-White race ($p = 0.0001$), being an ADT user ($p = 0.0001$), being a PC control ($p = 0.02$), and greater Charlson comorbidity score ($p = 0.0001$). Statistically significant predictors of greater hemoglobin decline over 12 months included ADT use ($p < 0.001$), lower activities of daily living score ($p < 0.001$), higher Charlson comorbidity score ($p = 0.02$), higher baseline hemoglobin level ($p < 0.0001$), and non-White race ($p = 0.04$) but not age ($p = 0.50$).

Conclusion: In men with non-metastatic prostate cancer, ADT was independently associated with a decline in hemoglobin level over 12 months. Other predictors of declining hemoglobin included comorbidity, functional status, baseline hemoglobin level, and race but not age. These findings may help clinicians identify patients starting ADT who would benefit from closer monitoring of hemoglobin levels.

UP069

Patient Decision-Making, Satisfaction, and Regret regarding Androgen Deprivation Therapy

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Introduction and Objective: Androgen Deprivation Therapy (ADT) is often used in the treatment of prostate cancer but little is known about patients' decision making preferences and satisfaction on ADT. We explored these issues in a pilot survey study.

Methods: A cross-sectional survey was distributed to 83 patients who visited the prostate clinic at the Princess Margaret Hospital, Toronto, Ontario. Eligible men included those who spoke English and were on ADT adjuvant to radiation therapy or radical prostatectomy (n = 53) or for biochemical relapse (n = 30). Three cohorts of men were recruited: men on ADT for <6 months (cohort 1; n = 22), between 6 to 18 months (cohort 2; n = 25), and between 18 months to 4 years (cohort 3; n = 36). Descriptive analyses were used to compare responses between cohorts. All patients were asked about their decisional making preference using the *Control Preferences Scale*. Decisional satisfaction with ADT use was measured in cohort 1 patients using the *Satisfaction with treatment decision scale (STDS)*, while patients in cohorts 2 and 3 were asked about decisional regret using the *Decisional Regret Scale (DRS)*. Patients were asked about their support network and any aspects of ADT that they found worrisome.

Results: Mean patient age was 70.5 years (range 46-85); 23.1% of patients preferred an active role with regards to decision-making, 49.4% preferred shared decision-making with their physician, while 27.0% preferred a passive role. Most patients achieved their preferred decision-making role (24.1% active, 53.0% collaborative, 22.9% passive). Mean patient satisfaction on ADT was high at 24.0/30 on the STDS (cohort 1 only) and decisional regret with ADT use was low at 8.0/25 (cohort 2) and 7.9/25 (cohort 3). There was 13.1% (8/61) of men in cohorts 2 and 3 combined who belonged to a support group. Of these, 3 (37.5%) had gone to the support group to receive more information regarding ADT. Aspects of ADT that patients found worrisome included: side effects (34.9%), efficacy (14.5%), cost (2%), none or did not answer (45.8%).

Conclusions: Patients on ADT are generally satisfied with their decision to start on ADT and express minimal decisional regret up to 4 years later. The majority of patients prefer a shared decision-making role when it comes to deciding to start ADT. Few men on ADT belonged to a formal support group; this may represent an area for further exploration and possible intervention. A key area to enhance patient education regarding ADT appears to be side effects.

UP070

A Canadian Surgeon's Learning Curve Following Adoption of Robotic-Assisted Laparoscopic Prostatectomy

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Introduction and Objective: The robotic-assisted laparoscopic prostatectomy (RALP) approach now accounts for >70% of cases in the United States. In the single-payer, 'socialized' Canadian healthcare system, adoption of new technology offers unique challenges particularly due to high costs and limited OR time. The result is slower throughput of cases, making it difficult for a surgeon to "achieve comfort". In this paper we describe the learning curves for a single Canadian surgeon switching from an open to a robotic approach.

Methods: This single Canadian surgeon had performed >2000 open radical prostatectomies (RP's) prior to adopting the RALP approach. We studied his first 139 consecutive RALP patients from 10-2007 to 07-2009. The 3 outcomes analyzed included 2 measures of surgical difficulty (console time and estimated blood loss (EBL)) and one of cancer control (surgical margin status (SMS)). Experience was coded for as the number of prior RALP's conducted before each index case. Multivariable regression models tested for an association between experience and these outcomes, with adjustment for established predictors. To produce learning curves, we plotted the predicted outcome from the model for each level of experience.

Results: On multivariable analysis, experience was strongly associated with console time and EBL ($p < 0.001$), but not SMS ($p = 0.2$). The learning curve for console time did not reach a plateau, suggesting that console time will continue to improve below 180 minutes. In contrast, the learning curve for EBL appeared to plateau at approximately 75 prior cases, and according to the modeling, may not likely decrease much below 300 cc. Overall, 20% of patients had a positive SMS and the rate of positive SMS did not appear to change with increasing early experience.

Conclusions: Our study provides the first formal prospective learning curve analyses for RALP. We show a continuous improvement in console time and EBL with despite a slower throughput of cases over time. However, we have no evidence to suggest a progressive learning curve for SMS beyond the excellent results from the earliest cases which may reflect the prior open RP experience of an oncologically-trained surgeon and the inclusion of many intermediate risk cases in a healthcare system which encourages careful utilization of OR resources.

UP071

Perineural Invasion and Ultrasound Findings on Transrectal Ultrasound-Guided Biopsy of the Prostate and Epstein's Pathologic Criteria may Be Complementary in the Prediction of Clinical Significant Prostate Cancer

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Introduction and Objective: Conservative treatment in prostate cancer (PCa) has become increasingly popular due to the concept that many tumours have low biological potential of progression. However, tools to predict these "insignificant" tumours remain somewhat elusive. We evaluated, based on radical prostatectomy (RP) specimens, the utility of different factors from transrectal ultrasound-guided biopsy of the prostate (TRUSBx), including the Epstein's criteria in predicting "clinically significant" PCa.

Methods: We retrospectively reviewed records of 1043 consecutive patients who underwent TRUSBx by one surgeon. Patients with PCa (n = 529) and those treated with RP (n = 147) were grouped as: "insignificant" (Gleason score ≤6, PSA density ≤0.15 ng/mL, tumour in ≤50% of any single core, and <33% positive cores) and "significant" PCa. Evaluable TRUSBx results were analyzed and compared with final RP pathology for association of "insignificant tumours" with perineural invasion, Gleason score, lymphovascular invasion, extracapsular extension and seminal vesical invasion.

Results: For our total group of patients and the group with insignificant tumours, the mean pre-biopsy PSA was 15.0ng/ml (±67.3 SD) and 7.8ng/ml (±8.2 SD), respectively. For the entire group the mean PSA density was 0.39ng/mL (±1.5 SD) and the median number of cores was 10 (range 5-22), and the mean tumour involvement in a single core was 42.15% (±32.5 SD). The mean gland volume after RP was 42.0cc (±19.6 SD). From TRUSBx results, we found perineural invasion in 36.4% of "significant" vs. 5.4% of "insignificant" prostate cancers ($p < 0.01$) and pathologic invasion of periprostatic tissue in 7% of significant vs. 0% of insignificant prostate cancers ($p < 0.01$). Ultrasound findings were associated with significant tumours ($p < 0.01$). As expected, Epstein's criteria were associated with Gleason ≤ 6 organ-confined tumours with ≤ 5% total volume in the final pathologic specimen ($p < 0.01$). Final Gleason score ($p < 0.01$) and extracapsular extension were discriminated by Epstein's criteria, but not lymph node status ($p = 0.39$) or seminal vesicle invasion ($p = 0.11$).

Conclusions: TRUS findings, perineural invasion and periprostatic invasion in TRUSBx specimens, in addition to Epstein's pathologic criteria, should be considered as factors to aid in the determination whether a PCa is clinically significant. This requires further study in other datasets.

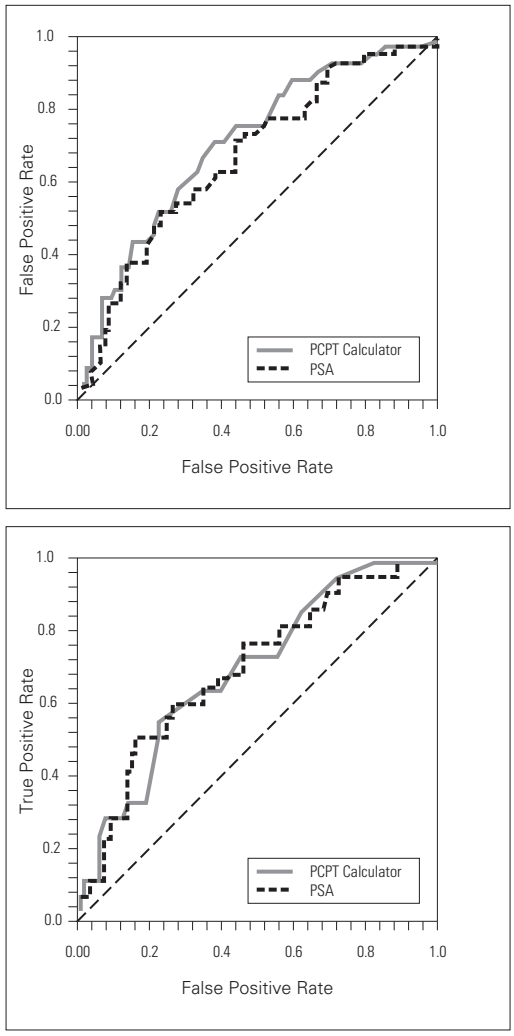

Fig. 1. UP072.

UP072

External Validation of the Prostate Cancer Prevention Trial Risk Calculator in a Canadian Cohort

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Introduction: The prostate cancer prevention trial risk calculator (PCPT-RC) was developed as a tool to assign risk of prostate cancer (PCa) and high grade (HG) disease in men considered for prostate biopsy. Prior data from our Canadian institution have shown higher rates of cancer detection at prostate biopsy than those published from other centres. We set out to determine the performance of the PCPT-RC in our cohort and to determine if it has utility among men <55 years of age.

Methods: Our institution maintains a prospective database of all prostate biopsies over the past 15 years (n~18 000). As of January 2009, covariables from the PCPT-RC were collected. These include race, age, PSA, DRE, prior biopsy, family history and use of 5 alpha reductase inhibitors. A cohort of 845 patients with complete information were then utilized to determine the predictive accuracy of the PCPT-RC for both PCa and HG disease. Receiver operating characteristic curves (ROC) were generated and compared by area under the ROC curve (AUC). We separately assessed the PCPT-RC among 133 men age <55 years in order to determine its utility in this group for whom the calculator was not designed.

Results: PCa was detected in 46% (n = 386) of men with an average PSA of 6.45. HG disease (Gleason score & ≥7) was detected in 22% (n = 185 men). Among men ≥55 the PCPT-RC was predictive for all PCa grades (AUC = 0.6) as well as HG disease alone (AUC=0.68); $p < 0.0001$ for both. It also performed better than PSA alone for predicting both PCa or HG disease ($p < 0.0001$, for both). Among patients <55 years of age, the PCPT-RC was predictive for PCa (AUC 0.72) and HG disease (AUC 0.7). However, in this group, the calculator performed no better than PSA alone as depicted in the figure ($p = 0.29$ and 0.96, respectively). The AUCs for the PCPT-RC in terms of cancer prediction were better in patients <55 years old compared to those ≥55 years of age ($p < 0.001$).

Conclusions: In our cohort, the PCPT-RC had mixed utility. Although it demonstrated discriminative ability over PSA alone in men over age 55, the absolute AUCs call into question its clinical practicality. Unexpectedly for men less than 55, a group for which the calculator was not designed, it performed better than in older men, but still fared no better than PSA alone. Overall, these data suggest that caution should be exercised in utilizing the PCPT-RC among Canadian men.

UP073

Development of a Real-time Intraoperative Electrical Impedance Tomography Sensor for Cavernous Nerve Mapping for Radical Prostatectomy

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Introduction and Objective: Radical prostatectomy is a proven efficacious treatment locally confined prostate cancer; however, rates of postoperative impotency continue to range between 10–30% in contemporary series. Thus, in addition to satisfactory cancer control, accurate localization of the cavernous nerves and the contributing plexus during resection is exceedingly important during radical prostatectomy. We have developed a real-time, intraoperative tissue impedance sensor for nerve localization based on electrical impedance tomography (EIT) technology, which will serve to reduce post prostatectomy impotence.

Methods: The prototype constructed consists of a probe with a needle array to interface with the tissue, and a signal generator and analysis system. The device cycles through each set of electrodes on the probe, and injects current while simultaneously computing the voltage change. Reconstruction algorithms determine nerve location based on tissue impedance properties. The system was functionally validated in an *in vitro* model system and following further refinement, rat sciatic nerve identification. For each trial, the probe was placed on the tissue and the device sequentially injected 5 mA sinusoidal current across each of its electrodes with the resulting voltages recorded.

Results: Each trial demonstrated the ability of the device to detect changes in impedance of different tissues. Electrodes closest to the wire in the *in vitro* model had the smallest voltage change, corresponding to a lower impedance value. V = 0.135V for the electrodes near the wire, compared to V = 0.256V for other electrodes. Localization of rat sciatic nerve was also successful demonstrating V = 0.294V for the electrodes near the nerve, compared to V = 0.467V for the remaining electrodes.

Conclusions: We have developed a real-time intraoperative tissue sensor prototype based on electrical impedance tomography which has demonstrated early proof of principle success in *in vitro* and small animal models of mixed tissue determination and nerve localization. With further refinements in both probe array fabrication and miniaturization as well as digital signal processing we believe this device may deliver significant benefit to procedures such as radical prostatectomy where nerve structures may be visually indeterminate but critical for preservation of function.

UP074

Utilizing Metformin to Enhance the Efficacy of Androgen Deprivation Therapy in the Treatment of Prostate Cancer

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Introduction and Objective: The incidence of prostate cancer varies by geographic location, with developed countries exhibiting higher levels of disease. Some attribute this to the 'Westernized lifestyle' of high energy diets coupled with lack of physical activity and consequent obesity. Rising obesity levels have been mirrored by increased diagnoses of non-insulin dependent diabetes (NIDDM). Whilst evidence for a causal association between obesity or NIDDM, and prostate cancer is mixed, clear evidence exists that obese prostate cancer sufferers have higher levels of prostate cancer-specific mortality. This may be due to obesity or diabetes-induced hyperinsulinemia, causing upregulated pro-proliferative insulin/insulin-like growth factor signaling. Androgen deprivation therapy (ADT) remains the gold-standard treatment for advanced prostate cancer. Metformin (an oral biguanide used to treat NIDDM) has been shown to possess anti-neoplastic properties *in vitro* and *in vivo*. Studies also show metformin treated diabetics experience less cancer diagnoses and/or prostate cancer-specific mortality. We assessed the potential additive benefit of combining ADT (bicalutamide) with metformin.

Methods: Using clonogenic assays we assessed the growth inhibitory effect of bicalutamide and/or metformin in LNCaP, PC3, DU145 and PC3AR2 prostate cancer cell lines.

Results: Exposing the cell lines to micromolar bicalutamide or millimolar metformin resulted in significant dose-dependent growth inhibition ($p < 0.001$). Combined treatment with bicalutamide and metformin caused a further 10-fold reduction in colony formation in cell lines expressing functional androgen receptors.

Conclusions: Combining bicalutamide and metformin significantly inhibits prostate cancer cell growth, further than monotherapy alone. These results are being further evaluated to determine whether this positive interaction is additive or synergistic. We are also assessing the combination regimen *in vivo* using a murine xenograft model and are performing mechanistic studies to determine how bicalutamide and metformin interact. This combination regimen may potentially improve prostate cancer-specific survival via the direct anti-neoplastic properties described above. In addition, although not investigated here, metformin, within the combination treatment regimen may improve overall survival rates by reducing the risk of anti-androgen induced metabolic syndrome, with its consequent cardiovascular related mortality.

UP075

Extreme Hypofractionated Intensity-Modulated Radiotherapy (35 Gy in Five Fractions) for Localized Low-Risk Prostate Cancer

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Introduction and Objective: There are a number of management options for men with low risk localized prostate cancer, including external beam radiotherapy (EBRT). Hypofractionating EBRT can theoretically maintain high bioequivalent tumour doses without increasing acute and late toxicities, while decreasing treatment visits. A number of centres have reported the results of hypofractionated schemes but many utilize stereotactic body radiotherapy techniques. We report on the acute and late toxicities of a hypofractionated accelerated radiotherapy regimen using a standard linear accelerator.

Methods: A phase I/II study in which patients with T1-2b, Gleason ≤ 6, and PSA ≤ 10 ng/mL prostate cancer received 35 Gy in 5 fractions, once a week over 29 days. Treatment was delivered with intensity-modulated radiotherapy (IMRT) on standard linear accelerators, with daily image guidance using gold seed fiducials, and a 4 mm CTV-PTV margin. Common Terminology Criteria for Adverse Events v3.0 and Radiation Therapy Oncology Group late morbidity scores were used to assess acute and late toxicities, respectively.

Results: As of September 2009, 84 patients have completed treatment with a median follow-up of 18 months (range 6–30 months). Treatment was well tolerated with no Grade 3 or 4 acute gastrointestinal toxicities or fatigue. One patient (1%) had acute Grade 3 urinary toxicity, none had Grade 4. No patients experienced late Grade 3 or 4 bowel or urinary toxicities. The median PSA pre-treatment was 6.0 ng/mL and this decreased to 1.07 ng/mL at last follow-up, with 81% of patients with a PSA $\leq$ 2.0 ng/mL. No patient had failed biochemically.

Conclusions: This novel technique employing standard linear accelerators to deliver an extreme hypofractionated schedule of radiotherapy is well tolerated and initial outcomes appear promising. Further follow-up is needed to better document late toxicity and efficacy.

UP076

The Effect of Androgen Deprivation Therapy on Cardiovascular Disease in Men with Prostate Cancer

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Introduction and Objectives: The use of androgen-deprivation therapy (ADT) with GnRH analogue (Goserelin) for the treatment of prostate cancer is associated with increased risk of cardiovascular disease (CVD), of which early detection and intervention may improve overall survival. High sensitivity C-reactive protein (hs-CRP) and pro-B-type natriuretic

peptide (Pro-BNP) act as independent predictors for increased CVD risk. This is the first study to investigate if early increase in CVD risk in patients commenced on ADT can be identified through the measurement of hs-CRP and Pro-BNP.
Material and Methods: Thirty-nine men with any stage of prostate cancer due to receive ADT -using a GnRH agonist- were recruited to a prospective study. Patients' hs-CRP, Pro-BNP, blood glucose and lipid profile were measured on commencement of ADT and subsequently on regular follow ups during the first year of treatment.
Results: During the follow up period, there was no significant change in hs-CRP level ($p > 0.1$). There was significant increase in the pro-BNP level especially after 12 months of treatment ($p = 0.001$). There was no clinically significant change in other lipid profile parameters, blood glucose or U&Es.
Conclusions: The increase in pro-BNP level in the study group may predict an early increase in CVD risk in patients on ADT. We couldn't demonstrate the effect of ADT on other CVD risk factors and there was no significant change in hs-CRP, which may be due to the small study size. Further study will ascertain if pro-BNP and hs-CRP can be used to detect early increase in CVD risk in patient on ADT.

UP077

Poly(ADP-Ribose) Polymerase 1 (PARP-1) Expression Correlates with Cell Sensitivity to Cytotoxic Chemicals in Prostate Cancer Cells

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Introduction and Objectives: The poly(ADP-ribose) polymerase 1 (PARP-1) protein is crucial for proper DNA single strand break repair. When the genotoxic stress reaches a point at which the cell is unable to properly repair the DNA damage, PARP-1 is cleaved by caspases, thereby inhibiting DNA repair and committing the cell for apoptosis. Since PARP-1 is associated with both DNA repair and cell death, it is relevant to determine whether its expression in prostate cancer cells could participate in the cellular response to chemotherapeutic treatment. Our objectives are to evaluate the expression of PARP-1 in prostate cancer cell lines and primary tumours. Such observations could enlighten us on the potential clinical applications of PARP-1 inhibitors in prostate cancer therapy.
Methods: We evaluated PARP-1 expression and cleavage by Western blot in both hormono-sensitive (HS) (LNCaP and 22Rv1), and hormono-resistant (HR) (PC-3 and DU-145) cell lines. Apoptosis was induced by treatment with camptothecin and staurosporine for 6 and 24 hours. Caspase-3 cleavage was used as a proxy for apoptosis. PARP-1 expression in primary tumours was assessed by immunohistochemistry on tissue microarray containing cores from 63 prostatectomy specimens.
Results: HS cell lines had a basal PARP-1 expression higher than the HR cell lines. The HS cell line 22Rv1 expressed higher levels of PARP-1 than all the other cells lines. No cleaved PARP-1 was observed in HR cells after 6 hours of treatment, but was detected following a 24-hour treatment. The expression level of the cleaved fragment was nonetheless lower in HR cells. Interestingly, our preliminary results from the IHC study suggest a higher PARP-1 expression in cancerous tissues compared to normal adjacent tissues. The presence of the cleaved form of PARP-1 is currently investigated.
Conclusions: Our preliminary results suggest that PARP-1 expression is correlated to cell sensitivity to apoptosis-inducing compounds. The lower expression of cleaved PARP-1 in HR cell lines might be related to the androgen receptor status. These findings support a possible function of PARP-1 in treatment resistance in prostate cancer. Modifying PARP1 levels in HS and HR cells, as well as depleting endogenous androgens will shed light on the potential sensitizing effect of PARP-1 on prostate cancer cells.

UP078

Preoperative PSA Velocity: A Prognostic Measurement Post Radical Prostatectomy

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Introduction and Objective: PSA velocity (PSAV) is an important clinical factor in the diagnosis of prostate cancer. Our goal was to assess the utility of preoperative PSA velocity calculation after radical prostatectomy by examining its correlation to pathologic stage and Gleason score, positive margins, biochemical recurrence and prostate cancer specific mortality.
Methods: Charts were abstracted from the Alberta Urology Institute Radical Prostatectomy Database. Clinical and demographic data included clinical stage, number of biopsy cores, number of positive biopsies, and preoperative PSA values, radical prostatectomy pathology, postoperative PSAs, and prostate cancer specific mortality. Statistical analysis included linear regression and odds ratio calculation.
Results: Of 1832 patients, 382 (21%) had two PSA measurements separated by one year, allowing for PSA velocity calculation. Median follow up was 5.4 years. Overall mean preoperative PSA was 7.50 ng/mL (median 6.25 ng/mL) with mean PSAV of 4.83 ng/mL/year (median 1.84 ng/mL). A total of 103 (27%) men had pathologic stage T3 or higher disease, and 207 (54%) had a Gleason score of 7 or more. PSAV strata were defined as 0.75 ng/ml/year strata, and biochemical failure was defined as PSA greater than 0.1 ng/ml. Pathological T3 disease and biochemical failure were strongly associated with PSAV > 0.75 ng/ml/year (OR = 1.702, 95% CI = 0.90 to 3.20, $p = 0.1$, and OR = 1.95, 95% CI = 0.80 to 4.78, $p = 0.2$). Positive margin status and Gleason score of 7 or higher were not associated with PSAV >0.75 ng/ml/year. Comparison of means analysis revealed that patients with pathologic T3 disease, positive margins, or biochemical failure all had higher mean PSAV than those with pathologic T2 disease, negative surgical margins, and undetectable PSA respectively, although no discrete PSAV cutoff was established. Kaplan-Meier survival analysis showed that patients with a PSAV > 0.75 ng/ml/year had a higher rate of biochemical failure, but this failed to reach statistical significance ($p = 0.2$). The odds ratio of prostate cancer specific mortality for the same PSA strata was 1.88 (n = 3, 95% CI = 0.48 to 6.5).
Conclusion: Preoperative PSAV calculations may be a useful adjunct in the management of patients post radical prostatectomy. PSAV correlates with higher pathologic stages and biochemical recurrence, as well as positive surgical margins. Further follow up of this cohort with complete 10 year data may reveal a correlation between PSAV and prostate cancer specific mortality.

UP079

Correlating Preoperative Free/Total Prostate Specific Antigen Ratios of Radical Prostatectomy Patients to Gleason Score

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Introduction and Objective: To resolve conflicting data on the correlation of high grade tumours to low percent free/total PSA ratios (%FPR) in patients, and to determine if this PSA ratio can differentiate clinically significant cancer from indolent low grade prostate cancer (CaP).
Method: A retrospective analysis of 133 consecutive radical prostatectomy patients was performed. All patients were required to have had at least one prior %FPR measurement. Tumour grading was performed in a standard synoptic report, based on the 2 most aggressive patterns.
Results: We identified 53 (39.8%) prostatectomies yielding Gleason scores of 6 or less, with an average %FPR of 11% and a median value of 9%. Of the 62 (46.6%) prostatectomies that were Gleason 7, there was an average %FPR of 7% and a median value of 8%. The 18 (13.5%) prostatectomies that were Gleason 8 or more had an average %FPR of 9% and a median value of 9%. Despite a lack of correlation in these results, it was found that there was a distinct boundary of 15% FPR at which no additional high grade (8 or more Gleason score) cancers were found. Of the patients with 15 %FPR or more, 62.5% exhibited Gleason scores of 6 or less. 37.5%

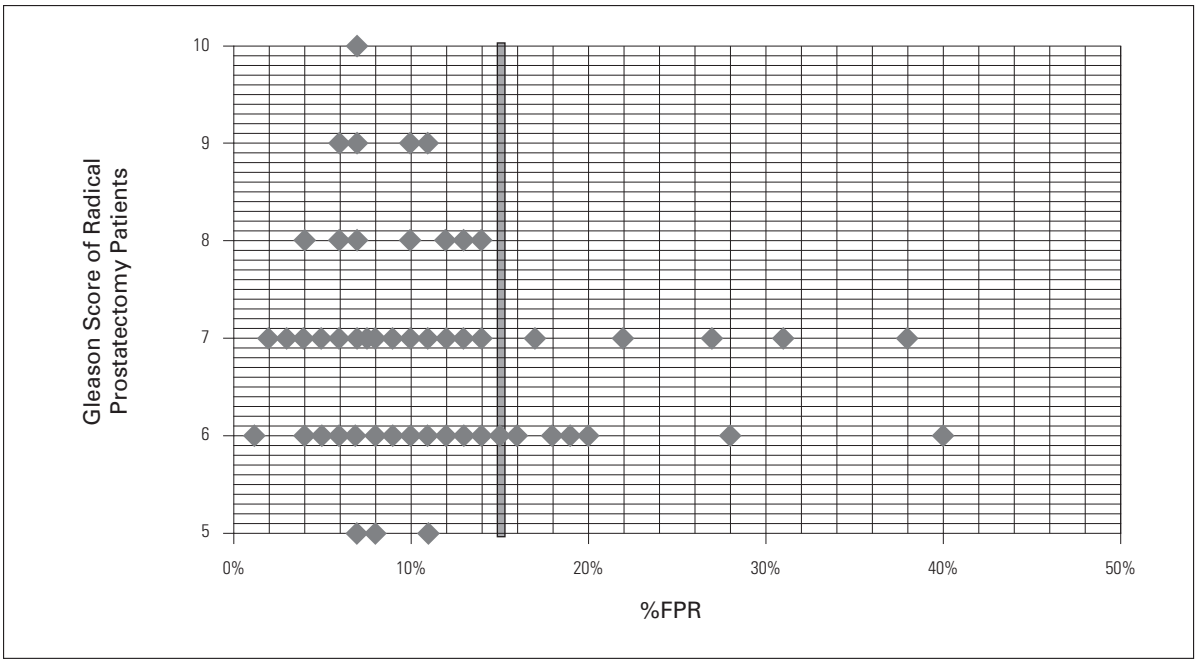

Fig. 1. UP079.

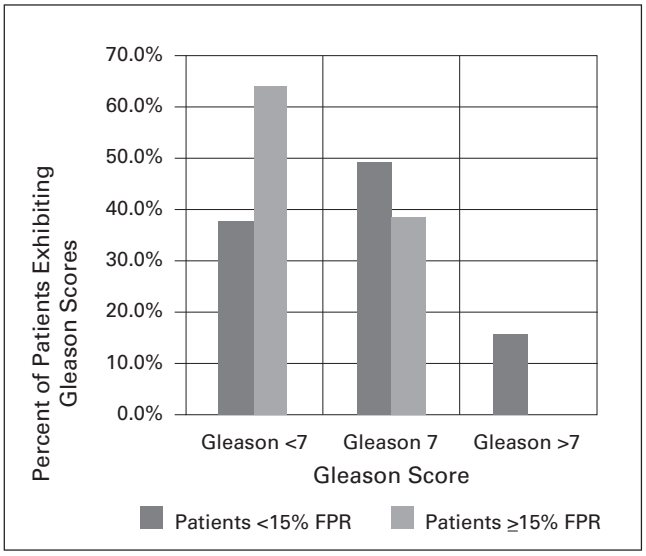

Fig. 2. UP079.

exhibited Gleason scores of 7. No patient with a %FPR of 15 or more was observed with a Gleason score of 8 or more. A similar correlation could not be observed in patients with %FPR less than 15.

Conclusion: The probability of finding Gleason 8 cancer in patients with a %FPR greater than 15% is unlikely. However, in patients with a %FPR less than 15%, there was no correlation between high grade and low grade disease.

UP080

From Clinical Trial Efficacy to "Real World" Effectiveness: Oucomes with Docetaxel in Metastatic Castration Resistant Prostate Cancer 5 years after TAX327

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Introduction and Objective: The TAX327 trial published in 2004 (Tannock et al, NEJM) observed that docetaxel improved survival and QOL in metastatic, castration resistant prostate cancer (mCRPC) and it has since become a standard of care. The goals of this study were to examine the subsequent use of docetaxel in mCRPC, and specifically to determine if the "real-world" results (effectiveness) of docetaxel are similar to the trial results (efficacy).

Methods: A retrospective chart review of mCRPC patients treated with docetaxel in Halifax NS over a 5 year period, post TAX327 results (June 2004–June 2009), was conducted.

Results: Among the patient cohort of 56 patients the median age was 68 years (range 46–83), median baseline PSA was 224 µg/L (range 6.1–4790) and patients received a median of 7 cycles of chemotherapy (range 1–10). Overall, 54 (96%) patients were symptomatic at the beginning of chemotherapy. Among symptomatic patients, 47 (87%) had pain with 33 of these (70%) requiring narcotics. Eligibility criteria for TAX327 were met in 40 (71%) patients. Among the 26 patients not meeting eligibility criteria, the most common reason was Hgb <10 g/L in 7 (27%) and <6 wks from discontinuing nonsteroidal antiandrogens in 6 (23%) patients. Median overall survival (OS) for the entire patient cohort was 12.4 months (95% CI 9.4–15.2). No significant differences in OS were identified when comparing TAX327 eligible and ineligible patients, and those with or without baseline pain.

Conclusions: The median OS of our cohort appeared inferior to the TAX327 results (12.4 compared to 19.2 months). This may be partly due to the fact that patients in our cohort may have had a poorer pre-treatment prognosis (84% of our patients had baseline pain compared to 45% in TAX327) and a proportion (29%) did not meet eligibility criteria for TAX327. Similar to other 'real world' versus clinical trial comparisons of therapeutic outcomes in oncology, the effectiveness of palliative docetaxel in mCRPC, in regard to OS, may be inferior to that observed in the landmark clinical trial.

UP081

Collective Efforts to Establish a High Quality Prostate Cancer BioBank in Quebec

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Introduction and Objective: Prostate cancer (PCa) ranks 1st among cancers in Canadians and 3rd as leading cause of death by cancer. Its incidence continues to increase and etiologic factors remain largely unknown. Moreover, it is difficult to predict which cancers will evolve and recur after therapy. This highlights the importance of research but access to high quality tissues is a major impediment for advancement. With this in mind, a pan-provincial prospective PCa biobank containing clinical and epidemiologic data coupled with biospecimens was established. This project was launched in 4 major teaching hospitals in 2007. Our objectives in this study were to examine sample quality.

Methods: Newly diagnosed patients undergoing prostatectomy agreed to sign an ethically approved consent to participate in the project, i.e. to fill a detailed questionnaire and donate blood, urine, and prostate tissues. Specimens were systematically processed in a timely fashion and banked frozen on site using common standardized operating procedures. Quality was evaluated on blood DNA and RNA (~50 each/site) and tissue RNA (n = 34). Histopathological analysis was conducted on 640 frozen prostate slices whose tumour and benign contents were determined. Frozen sections (n = 246) were compared to mirror images or adjacent sections from corresponding paraffin blocks.

Results: Between January 2007 and end of December 2009, 1000 participants were enrolled in the project. A complete questionnaire was obtained in 90% of cases and validated in 80% of patients. Serum, plasma, total blood (Whatman paper), buffy coat layer, blood RNA, and clarified urine were banked in 96% of cases. There were 758 complete cases (76%). The quality of DNA from buffy coat and RNA from whole blood was excellent. Indeed, 99% of PCR genomic amplification of the β-globin gene displayed the expected 4 bands and RIN scores of RNA from blood and tissues were 8.0 and above (on 10) in 78% and 76% of samples, respectively. In frozen tissues, tumour foci were found in over 70% of sections presumed malignant whereas concordance was 90% for benign.

Conclusions: The structure established under the umbrella of PROCURE allows banking of high quality biospecimens. The parallel collection of patients' socio-demographic data and lifestyle habits, coupled to corresponding clinical data, renders the PROCURE Prostate Cancer BioBank a unique and most promising research tool for the future.

UP082

Temporal RF-Ultrasound Augmentation of Prostate (TRAP): Enhancing Prostate Cancer Detection Utilizing Temporal Ultrasound Radio Frequency Signals

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Introduction and Objectives: Ultrasound echo signals are affected by the geometrical deregulation of cellular architecture in neoplastic tissue and can be exploited to differentiate normal from various grades of cancerous tissue, information that is not visible in post-processed B-scan ultrasound images. We have proposed to apply an innovative approach to process raw transrectal ultrasound (TRUS) radio-frequency (RF) signals for the early detection of prostate cancer.

Methods: *Ex vivo* experiments have involved evaluation of a time series, through fractal and frequency analyses, of raw temporal RF ultrasound signals to differentiate tissue types in 35 human prostates obtained after radical prostatectomy. Previously described ultrasound texture features for tissue typing were included in these studies for comparison. Detailed whole mount sectioning of the prostate specimens were regarded as the gold standard and compared to probability maps created by analysis of the temporal RF signals.

Results: Comparing the generated probability maps of prostates scanned ex vivo to the detailed pathology reports have demonstrated sensitivity and specificity values of 90% and 85% respectively, in characterizing cancerous tissue. The area under receiver operating characteristic curve for the subset of RF time series evaluation was 0.87, which increased to 0.95 when combined with other ultrasound texture features. Validation utilizing leave one patient out resulted in an area under the curve of 0.82.

Conclusions: These results suggest that the temporal ultrasound echo signals can be employed to differentiate different tissues in the prostate and subsequently improve cancer detection. Furthermore, we propose to train classifiers in order to visualize this information as color-coded probability maps on real-time US images and have initiated an *in vivo* study for men undergoing TRUS guided biopsy.

UP083

Impact of Surgical and Hospital Volume on In-Hospital Complications In Patients Undergoing Minimal Invasive Prostatectomy: A Population Based Study

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Introduction and Objectives: The proportion of minimally invasive radical prostatectomies (MIRP) for treatment of prostate cancer patients is increasing. To date, only two reports assessed different outcomes in MIRP patients, using population-based databases. Both reports are unable to confirm that increased surgical (SV) or hospital volume (HV) is related to lower perioperative complication rates in patients undergoing major surgery. Based on the rapid diffusion of MIRP we assessed the use of MIRP procedures and relationship between SV, HV and in-hospital complication rates and transfusion rates in a large population-based cohort.

Material and Methods: The number of MIRP procedures between the years 2002–2008 within the State of Florida was assessed using the Florida Inpatient Database (n = 2674). Individual annual SV and HV were calculated based on unique surgeon and hospital identifiers. Univariable and multivariable logistic regression models for prediction of complication rates in SV and HV were assessed. Covariates consisted of age, comorbidities, race, and year of surgery.

Results: The number of MIRP increased by 148-fold (8-1188) from the years 2002 to 2008. The annual SV ranged from 1-171 (mean 20.0, median 4.0) and the majority (>60%) of surgeons performed between 1 and 4 MIRPs annually. When individual surgeons were grouped according to SV tertiles (low = 1-15; intermediate = 16-63, high = >63), only 2% of MIRP surgeons were within the high volume group in 2008. In-hospital complication and transfusion rates were 14.0 vs. 3.5%, 7.5 vs. 1.0%, and 5.5 vs. 0.5% for respectively low, intermediate, and high volume surgeons. In multivariable analyses, patients operated by surgeons with intermediate or high SV were respectively, 46% and 61% (both $p < 0.001$) less likely to develop any complication relative to patients who underwent a MIRP performed by low volume surgeons.

Conclusions: MIRP is a rapidly diffusing treatment modality in prostate cancer patients. Based on these results, SV and HV can be considered important factors in the lowering of in-hospital complication and transfusion rates, after adjustment for comorbidities, age, year of surgery, and race. This finding warrants consideration for patients seeking the optimal outcome and health care provider when resource allocation decisions for new programs or robotic equipment are made.

UP084

Comparison Between Complication Rates, Length of Stay and Costs of Minimally Invasive vs. Open Radical Prostatectomy

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Introduction and Objective: Studies from tertiary care centre suggests that minimally invasive radical prostatectomy (MIRP) may be associated with a more favorable rate of complication, shorter length of stay (LOS) and possibly equal cost relative to open radical prostatectomy (ORP). We assessed these three endpoints in a large population-based cohort.

Methods: In the state of Florida, 2105 MIRP and 24 071 ORP were performed between January 1,2002 and December 31,2008. The rates of complications (all categories grouped as any type of complications, as well as specific individual complications) and the distribution of costs and LOS were compared between the two groups (MIRP vs. ORP).

Results: The number of overall complication (5.6 vs. 7.0%; $p = 0.008$), digestive complications (3.2 vs. 4.3%; $p = 0.012$) and the transfusion rate (1.8 vs. 10.3%; $p < 0.001$) statistically significantly differed between MIRP and ORP. After MIRP, means LOS was shorter than after ORP (1.9 vs. 2.7 days; $p < 0.001$). The total hospital charges were higher for MIRP vs. ORP (32.219 vs. 31.809; $p < 0.001$) (MIRP range: 2,259–324,048 dollars vs. RP range: 1,580-626,178 dollars). After adjustment for the baseline patients characteristics such as age, Charlson Comorbidity Index, hospital and surgical volume, year and type of surgery, no statistically significant differences for the complications rates between the two procedures were found ($p = 0.265$). In the linear regression model, a statistically significant relationship for the total hospital charges were found for lower surgical and lower hospital volume, year of surgery and patients CCI (each $p < 0.001$), but not for type of surgery. The LOS was influenced by age, CCI, hospital and surgical volume, year and type of surgery (each $p < 0.001$).

Conclusions: Complication rates and total hospital charges in MIRP patients were not statistically significantly different from ORP patients. After adjustment for baseline patients' characteristics, differences between both cohorts exist for the length of hospital stay.

UP085

Extra Prostatic Extension of Prostate Cancer is a Significantly Greater Risk Factor for Overall Survival than Positive Surgical Margins

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Introduction and Objective: It has been suggested that following radical retropubic prostatectomy (RRP) patients with positive surgical margins (PSMs) without extra prostatic extension (EPE) of their prostate cancer (T2 disease) should be placed in a prognostic category equivalent to patients with EPE (T3 disease). The association of positive surgical margins with a high risk of prostate cancer recurrence supports this assertion. It would seem intuitive that both patients with T3 disease and patients with PSMs are at a high risk of having residual tumour in the operating field. We wished to review this association in a single institution, single surgeon and single pathologist series.

Methods: There were 108 patients who had undergone radical prostatectomy by a single surgeon between 1993–2001 with pathological PSM's and/or EPE who were identified and compared with 40 matched control patients. Mean follow-up was 10 years and at the time it was the institutional policy not to offer adjuvant radiation treatment. No patient had neoadjuvant therapy. Pathological examination was repeated by a single pathologist. Gleason score, tumour volume, seminal vesicle invasion, lymphovascular invasion, nodal metastases and the presence and location of extra prostatic extension were all recorded. Clinical follow-up data was collected in the form of PSA tests, bone scan results, clinical follow up and mortality data.

Results: Results are summarized in Table 1. There was a strong correlation between EPE and development of biochemical recurrence, metastases and death from prostate cancer. Patients with PSMs without evidence of EPE had a significantly lower risk of Biochemical failure, and metastases development and mortality than patients with EPE irrespective of PSM status. A trend of decreased overall survival was identified with EPE, however this did not reach significance. Significant differences were also noted in metastatic risk between EPE into or abutting periprostatic fat, into neurovascular bundles and elsewhere outside the prostate with mortality rates of 89%, 78% and 22% respectively.

Conclusions: This study confirms the finding that EPE in prostate cancer is associated with a high biochemical failure rate, metastatic recurrence rate and ultimately high mortality following RRP. However this study does not support the assertion that in the context of T2 disease, PSMs result in a prognosis similar to patients with T3 disease. We speculate that classification bias due to variation in the pathological analysis may account for the high reported incidence of recurrence in patients with PSMs without EPE and that many patients following detailed pathological examination may have unrecognized EPE.

Table 1. UP085. Prognostic significance of EPE versus margin

	EPE only (n = 47)	Margin only (n = 23)	Both EPE & margin (n = 38)	Control (n = 40)	*p* value
Biochemical failure (3–160 mo)	42%	28%	58%	13%	<.001
Metastasis	19%	0%	24%	0%	<.001
Survival (1-6 yrs)	91%	100%	85%	100%	.027
Gleason score ≥7	92%	70%	87%	75%	

* = The differences in rates of biochemical failure, metastasis and survival between +EPE only and +EPE & margin are not statistically significant.

UP086

Predicting Prostate Biopsy Results: The Saint John Experience

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Introduction and Objectives: Prostate specific antigen (PSA) and digital rectal examination (DRE) lack the sensitivity and specificity to predict prostate biopsy results. Validated risk calculators, such as the Calculator for Predicting Prostate Cancer Detection derived from the Prostate Cancer Prevention Trial, have been established to better predict biopsy results. The purpose of our study was to identify factors that contribute to a positive prostate biopsy within our patient population in Atlantic Canada.

Methods: The institutional ethics review board granted permission for this study. We retrospectively reviewed the charts of 1271 men undergoing transrectal ultrasound (TRUS) guided prostate biopsy. The following factors were recorded: age, PSA, DRE result, use of 5 reductase inhibitor, family history (first degree relatives), biopsy result, prostate volume and number of cores taken. Statistical analysis was completed using Gnu Regression Econometrics and Time-series Library (GRETL).

Results: The average age of men with a positive biopsy and negative biopsy was 66.6 and 63.5, respectively ($p = 0.0008$). Men over 70 were more likely to have a positive DRE result in a positive biopsy compared to men under 70 with a positive DRE (61.8% vs. 47.6%, $p = 0.00002$). With each rise in PSA of 5 ng/ml the odds of a positive biopsy increased

by 1.39 (p = 0.0002). Each additional affected relative increased the odds of a positive biopsy by 1.29 (p = 0.0097). With each increased in age of 5 years the odds of a positive biopsy increased by 1.27; each increase in 10 years increased the odds by 1.63 (0.0000006). Prostate volume, use of 5 reductase inhibitors and DRE were not independent predictors of positive biopsies.
Conclusion: In our patient population age, PSA value and family history represent statistically significant predictors of a positive biopsy result. This data will aid in counseling patients prior to undergoing a prostate biopsy. In future studies we plan to directly apply the Prostate Cancer Risk Calculator to our study population.

UP087
Are Patients' Expectations met after Robot Assisted Radical Prostatectomy?
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Introduction and Objective: Recently it has been hypothesized that robotic-assisted radical prostatectomy (RARP) leads to unreasonably high expectations translating into lower postoperative patient satisfaction compared to open radical prostatectomy (RP). We evaluated how patients assess the results of RARP relative to their expectations.
Methods: We contacted 1019 men with at least 7 months follow-up following RARP. An independent epidemiological service conducted a phone survey with a five-level Likert item questionnaire to evaluate to what extent the surgery and its outcomes met expectations. Baseline demographic and clinicopathological characteristics were collected along with health related quality of life (HRQOL) and recurrence-free status (PSA < 0.1 ng/ml) at 3, 6, 12 and 24 months following surgery using SF-36™ and University of California Los Angeles Prostate Cancer Index (UCLA-PCI) questionnaires.
Results: Seven hundred forty six patients (73%) completed the survey, of which 655 (87.4%) reported their expectations regarding the surgery and its outcome were satisfactorily met and 451 (60%) reported the expectations were exceeded. No differences in age, PSA, pathological stage, pathological Gleason score, positive-margin rate, recurrence rate or median time of follow-up were observed between the two groups (all p-values > 0.05). Poor sexual function was the most significant factor associated with unmet expectations (OR = 1.09, 95% CI 1.03–1.15, p = 0.001).
Conclusions: With comprehensive preoperative counseling and presentation of realistic outcomes, RARP meets or exceeds patients' expectations in the overwhelming majority of cases.

UP088
Neonatal Circumcision Practice in Southwestern Ontario: Need for a Structured Training Tool
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Introduction and Objective: Neonatal circumcision is a commonly performed outpatient procedure in our community. We conducted a survey to determine who performs the procedure, their background training, their ability to recognize contraindications and their comfort level in managing complications. The objective of this study was to identify areas that could improve the outcome and safety of neonatal circumcisions.
Methods: A 19-question cross-sectional survey including a visual identification item was submitted to 87 physicians who perform neonatal circumcisions in Southwestern Ontario. The study subjects were contacted by mail, fax, and personal phone calls were made in order to improve the response to the survey.
Results: The response rate was of 76%. Of the surveyed population, 85% was made up of family physicians (FP), while the remaining 15% were pediatric general surgeons and urologists. The two most common methods used for circumcision were the gomco clamp and the plastibell; 43% of the FP learned their technique of circumcision from a colleague FP, while none had a structured training course. With regards to the early complications post circumcision, 100% of the surgeons vs. 63% of FP felt comfortable dealing with bleeding (p = 0.046). 87.5% of the surgeon population vs. 35% of FP were comfortable in dealing with urinary retention (P = 0.01). 100% of surgeons vs. 53% of the FP were comfortable in dealing with a wound dehiscence (P = 0.02). With meatal stenosis, 75% of the surgeons and 10% of the FP were comfortable managing this complication (P < 0.01). There was 62% of surgeons vs. 36% of the FP who were confident in dealing with a trapped penis post-circumcision (P = 0.24). Finally, when shown a picture of a congenital concealed penis where neonatal circumcision is contraindicated, 31% of the FP were happy to proceed with circumcision in that setting.
Conclusions: Most physicians performing neonatal circumcisions received informal training, which may lead to a considerable number of complications and unsatisfactory results. Some practitioners do not seem to be aware of cases where circumcision is contraindicated. Based on this, we have developed an educational video on the surgical technique of neonatal circumcision and are in the process of setting up a formal training course funded by a grant from the Canadian Institutes of Health Research to better educate physicians.

UP089
Near Infra Red Spectroscopy (NIRS): A Non-Invasive Method to Evaluate the Function of the Lower Urinary Tract in Children
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Introduction and Objective: NIRS is a non-invasive method to study lower urinary tract function by monitoring the changes in concentration of the chromophores (oxy and deoxy hemoglobin) in the detrusor. The purpose of this study was to assess the feasibility of NIRS in children and to correlate the findings with uroflowmetry and cystometrogram results in healthy children and those with lower urinary tract symptoms.
Methods: PortaMon® (Artinis Medical Systems) wireless NIRS system was used. Thirteen children (4 male, age range: 4–17y median: 10 y) were evaluated. These included 4 healthy subjects. The remaining 9 had a diagnosis of non-neurogenic lower urinary tract dysfunction (8 patients) and urethral stricture (1 patient). Simultaneous uroflow or cystometrogram was done in 12 and 2 cases respectively. The NIRS emitters and receivers were secured to the abdominal wall 1–2 cm above the symphysis pubis. NIRS data collection started 10–15 seconds before permission to void and continued for 30 seconds following termination of voiding. NIRS chromophores graphs and urodynamic tracings were compared between normal and symptomatic cases.
Results: In 4 cases the data was not useful due to technical issues (positioning of the probe, motion artifacts, etc...). Comparison of patients with abnormal bladder function with healthy subjects revealed two reproducible differences: lack of initial increase in detrusor oxyhemoglobin concentration following permission to void and steady increase in deoxygenated hemoglobin during detrusor contraction. NIRS chromophore changes were also observed during overactive detrusor contractions seen throughout filling cystometry.
Conclusions: Our preliminary results are showing that NIRS is technically feasible in children and able to differentiate between normal and abnormal lower urinary tract function. Further studies are required to confirm these qualitative findings and measure them quantitatively.

UP090
Mathematical Modeling for Predicting Surgical Intervention in 3738 Children with Vesicoureteral Reflux: A Cohort Study
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Introduction and Objective: No method exists for predicting which child with vesicoureteral reflux (VUR) will have surgery. Our goals were

to analyze practice patterns at a major pediatric centre, to recognize differences between children operated for distinct indications and to develop a validated parental counseling nomogram.
Methods: We analyzed a prospective cohort of 3738 children presenting with primary VUR (1996–2005). Surgical indications included: 1) breakthrough urinary tract infection (UTI), 2) non-resolution over 3 years, 3) decreased renal function and 4) parent/surgeon preference. Logistic regression was applied to a random 60% subset of children. Validation in the remaining 40% was done using receiver operating characteristic curve analysis and the Hosmer and Lemeshow goodness-of-fit test.
Results: Independent predictors of surgery included higher age at presentation (OR 1.24, 95% CI 1.07–1.44, $p = 0.006$), antenatal hydronephrosis (ANH) (2.66, 1.78-3.98, $p < 0.0001$), bilateral VUR (1.26, 1.04–1.54, $p = 0.02$) and VUR grade (grade 1: 0.37, 0.22–0.65; 2: 1.00, reference; 3: 2.03, 1.59–2.59; 4: 6.35, 4.62–8.72; 5: 9.83, 6.42–15.0, all $p < 0.0001$). Gender was not associated with the overall risk of surgery ($p = 0.52$). Predictors of surgery for a breakthrough UTI included female gender, increasing age and bilateral and high grade VUR. Girls were less likely than boys to be operated for decreased renal function or parent/surgeon preference. AHN was a predictor of surgery for decreased function and parent/surgeon preference. The model had fair discrimination (c-statistic=0.68–0.76) and high calibration ($p \geq 0.24$). A nomogram was constructed.
Conclusions: Higher age at presentation, being followed for ANH, bilateral and high grade VUR are independent predictors of VUR-corrective surgery. Predictors of surgery vary with indication. Our nomogram for predicting surgical intervention in children with VUR will be a helpful counseling tool for the patients and their parents.

UP091

Duplicate Presentations in Two Top Pediatric Urology Meetings

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Introduction and Objectives: National conferences such as European Society of Pediatric Urology (ESPU) and American Academy of Pediatrics (AAP) are held annually to promote dissemination of new research findings among practitioners. As these conferences have limited agendas, presenting the same abstract more than once should be minimized in order to allow more studies to be shared. We conducted an observational study to determine the rate of duplicate research presentations between the ESPU and AAP meetings.
Methods: We cross referenced all clinical and basic research presentations at the ESPU meeting with those presented at the AAP on the corresponding year from 2006 to 2009 using a defined search strategy based on abstract title, authorship (first and last, order, and number), countries, institution, study design, significance, and sample size. All data abstraction was independently performed by three reviewers to improve accuracy. Agreement among reviewers abstracting data was above 90%, with discrepancies resolved by consensus. Descriptive statistics were carried out with the assistance of SPSS 17.0 (SPSS Inc., Chicago, USA).
Results: A total of 624 abstracts were presented at ESPU from 2006 to 2009. Out of these, 23 (17 podium and 6 poster presentations) were repeated at the AAP, which had a total of 640 abstracts exhibited. The duplication rate was 1% (4/316) in 2006, 4% (12/316) in 2007 and 2008, and 6% (18/316) in 2009. Among the 23 duplicate presentations, 48% were from North America, 39% from Europe and 13% from other countries. Those who presented papers at the ESPU meeting altered their presentations at AAP meeting in several ways: by changing the title (57%), adding or removing authors (24%), changing the authorship orders (63%), and changing the sample size (11%). Most of the duplicate abstracts consisted of prospective cohort studies (22%). While 30% of the duplicate presentations had statistically significant results, 7% had results that were not significant and 63% did not perform any statistical analysis. Out of the 23 duplicated abstracts, 52% had been published in a peer review journal thus far.
Conclusions: Although we identified only a 4% duplicate presentation rate between the ESPU and AAP meetings from 2006 to 2009, our results suggest that the number of duplicated abstracts has been increasing over the past four years. In addition, we have observed inconsistencies between the duplicate abstracts, which raise concern about the integrity of these studies. In order to address this concern, enforcement of guidelines should be strengthened to provide more opportunities for additional studies to be presented, hence, improving dissemination of new research findings among practitioners.

UP092

Puncture of Ectopic Duplex System Ureteroceles: Prognostic Factors Associated with the Need for Re-Operation

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Introduction and Objectives: The initial management of ureteroceles remains controversial. Puncture of ureterocele has been increasingly utilized as the initial approach. A significant number of these patients require further intervention. Herein we analyze potentially predictive factors associated the need of reoperation.
Methods: A single-centre retrospective review of patients who underwent initial endoscopic management of ureteroceles associated with a duplex system was conducted. Patient-related factors prior to surgery (age, gender, time of diagnosis, associated symptoms, presence of vesicoureteral reflux, urinary tract infections, laterality, location, ureterocele eversion and ipsilateral differential function) were analyzed. A time to event analysis was conducted with the Kaplan-Meier method, assuming non-informative censoring, and compared using the log-rank test.
Results: A total of 61 children (58 ectopic; 16 males, 45 females; mean age 12 months) underwent endoscopic puncture between 1992 and 2007. Overall reoperation was conducted in 35 (57%), with a mean surgery-free time of 59.17 months (95% CI 43.91–74.41). On a time to event analysis only the presence of preoperative urinary tract infections ($p = 0.03$) and <40% ipsilateral differential function ($p = 0.004$) were statistically associated with need for subsequent surgeries. Interestingly, no clear association was found with presence of vesicoureteral reflux either before or after puncture.
Conclusion: Our data suggests that the presence of preoperative urinary tract infections and decreased ipsilateral differential function were statistically associated with need for subsequent surgeries following endoscopic management of ectopic ureteroceles. These findings carry potentially important predictive power and, following validation with prospective studies, may assist with counselling, patient selection and monitoring.

UP093

Glans Amputation During Circumcision in the Newborn: Possible Mechanism of Injury and Prevention

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Introduction and Objectives: Accidental glans amputation during neonatal circumcision using clamps is uncommon but potentially devastating. The mechanisms of injury involved are poorly understood.
Methods: We present a series of 6 cases of glans amputation during neonatal circumcision and suggest a possible mechanism leading to this complication.
Results: All cases were circumcised as newborns using Mogen clamp. All patients had an oblique injury to the ventro-lateral aspect of the glans including the distal urethra, suggesting similar mechanisms of injury. We propose that the physiologic ventral adhesions were not properly released, probably to avoid bleeding, making it possible to get the glans trapped between the clamp blades after putting traction on the prepuce. In one of our cases the amputated distal glans was still fixed to the prepuce by balanopreputial adhesions. The amputated glans were reattached as free composite grafts in 3/6 cases. The grafts took well initially but significant hypotrophy developed in all 3 boys, which were reoperated on several months after the trauma in an attempt to improve glans esthetics. In one case a small piece of buccal mucosa graft was used to rebuild the ventral coronal margin.

Conclusion: Our findings suggest that the inadequate release of ventral adhesions in the basic physiopathological mechanism for all cases of accidental glans amputation described here. Ventral glans injury occurs secondary to the inclusion of the glans attached to the improperly released ventral prepuce in the clamp. Physicians performing circumcisions should be aware of the importance of adequate release of ventral adhesions before the insertion of the clamp in circumcisions.

UP094

Urologists' Position Toward Potential Prospective Randomized Trials (PRCT) of Open vs. Laparoscopic Surgery: Results of a Survey of Pediatric Urologists

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Introduction and Objective: Retrospective reports on laparoscopy in pediatric urology often conclude with calls for PRCTs to compare open with laparoscopic alternatives, yet none have been conducted to date. We sought to assess the prevailing attitudes of practicing pediatric urologists to the concept of such a PRCT, and to determine the potential variables they deemed important to include in PRCT design.

Methods: In 2009, an electronic de-identified confidential survey form was sent to registered members of the Society for Pediatric Urology. The survey consisted of 12 questions aimed at determining preferences and attitudes about surgical approach to pyeloplasty in children. Responses were filtered and compared using number of years in practice and reported comfort level with laparoscopy. (LP & OP = laparoscopic and open pyeloplasty, respectively).

Results: The survey was answered by 127 pediatric urologists. Of respondents, 61.9% have been in practice for >10 yrs. Most commonly, respondents characterized their general level of laparoscopic experience as intermediate (38%) or advanced (28%), with no statistical difference when controlling for number of years in practice ($p < 0.05$). Overall, 53% felt ambivalent, unsatisfied, or very unsatisfied with LP, while only 42% felt satisfied or very satisfied. When stratified by patient's age (yrs), most respondents preferred OP for patients <5 and laparoscopy for >7. Moreover, 18% still preferred OP in patients >11. From 16 factors influencing choice of surgical approach, patient age, level of laparoscopic experience, and parental preference emerged as predominant. Operating time, hospital costs, length of stay, and cosmesis were reported as less influential. Only 46% stated willingness to enroll patients in LP vs. OP PRCT. Trial outcomes of greatest clinical interest were stricture rate, reoperation, length of stay, and operating time. Interestingly, only 41% indicated that *'if a PRCT showed superiority of LP'* they would alter their practice.

Conclusion: Despite paucity of PRCT data, pediatric urologists demonstrate differences in acceptance or willingness to undertake LP vs. OP PRCT. Our data highlights the potential loss of equipoise and important obstacles in successfully conducting a PRCT on the subject. A PRCT design in this area should consider the main influencing outcomes noted above.

UP095

Pediatric Single-System Ureteroceles: Not Comparable to Adult Forms

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Introduction and Objectives: Most pediatric ureteroceles are associated with duplex systems. Less than 20% of pediatric ureteroceles are associated to single systems (SSU). There are few published data regarding management of SSU in children, and many assumptions in Pediatrics derive from adult data. We review the clinical behavior, diagnosis and management of pediatric SSU.

Methods: From a total of 117 pediatric ureteroceles (1993–2008) 18 (16%) were SSU. Clinical presentation, diagnosis, management and outcome were retrospectively analyzed, with a mean follow-up 4.6 y (median 3.5 y).

Results: The mean age at diagnosis was 16 m (1 m to 14 y). There were 16 males and 2 females. Two patients had solitary kidneys and 3 were bilateral cases (total of 20 ureteroceles). Thirteen patients (72%) were prenatally diagnosed, all with ureterohydronephrosis. UTI was present in 7 (39%) cases. Two babies presented acute renal failure due to obstruction (bilateral cases). DMSA scans showed 63% with <45% ipsilateral function in 12/15 unilateral cases (80%) (<10% in 4 cases). SSU were associated with renal abnormalities in 6/18 patients (multicystic dysplastic kidney, renal agenesis, horseshoe and pancake kidney). Management comprised ureterocele puncture (n = 17) and ureteral reimplantation (n = 1). Obstruction (n = 9), UTI (n = 5), prolapse (n = 2), renal failure (n = 2) and pain (n = 1) were the indications for surgery. 67% of the SSU were intravesical, 33% ectopic and 22% everting. Complications occurred in 56%. Post-puncture vesicoureteral reflux (VUR) occurred in 6 patients, one underwent reimplantation. Hydronephrosis resolved or improved in 17 patients (94%). Postoperative UTIs occurred in 22%.

Conclusion: SSU in children are more morbid than reported in adults. Kidney malformations were more frequent in SSU than in the general population. Puncture was effective therapy despite asymptomatic postoperative VUR.

UP096

Cryptorchidism and the Practice Patterns of the Primary Care Physician: A Survey Study

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Introduction and Objective: The increased risk of malignancy and infertility associated with cryptorchidism is well known. However, the classification of testicular maldescent and the subcategorization of retractile testes have the potential to lead to confusion in management of these disorders. It is unclear how this might affect the practice and referral patterns of primary care physicians. In order to elucidate this, we conducted a physician survey in four northwestern states.

Materials and Methods: Three thousand primary care physicians were invited to complete a web-based survey regarding cryptorchidism. We evaluated the nature of their practice and training as well as their knowledge of cryptorchidism and relationship to urologists.

Results: Four hundred and sixteen (13%) physicians responded to the survey. Fifty-two percent of respondents indicated that they had minimal to no exposure to pediatric urology during training. Sixty-three percent stated that they evaluated undescended or retractile testes at lease once per year. Three percent of respondents indicated that they never refer patients with undescended testes to a urologist. With regards to family counseling, 5% and 19% reported that they provided no counseling about potential for malignancy or infertility respectively. Twenty-five percent gave counseling that retractile testes did impart at least slightly increased risk of malignancy and infertility.

Conclusions: Despite clear evidence of increased risk of malignancy and impaired fertility associated with cryptorchidism and the lack of such evidence for retractile testes, there continues to be confusion about the implications and outcomes of these conditions. This underscores the need for increased evidence-based recommendations, as well as improved post-graduate training and education of primary care providers.

UP097

Sex, Sexuality, Procreation: Challenges in Teenage and Adult Years in Children Born with Complex Lower Urogenital Anomalies

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Introduction and Objective: Surgeons endeavour to reconstruct lower genitourinary anomalies early in childhood. Considerable success is achieved in restoring functionality but these individuals must make various lifestyle adjustments to cope with numerous challenges. Such patients managed in a Community Urology practice over the past 20 years were studied to identify these challenges and the strategies used in their man-

agement. Results of treatment as they affect Sex, Sexuality and Procreation were examined in 4 cases.
Materials and Methods: Records from hospitals and Physicians' offices were reviewed for demographic data, surgical procedures and diagnostic imaging studies performed and follow up patterns. Parents, when available, were interviewed. For this report, complex anomalies were those who had more than 2 attempts at corrective surgery.
Results: The 4 cases identified out of 15 and lessons learned are presented (1) Baby born with cloacal anomaly, imperforate hymen and solitary left kidney. After numerous surgeries she got married, conceived twice, 2 living sons delivered by cesarean section. Tubal ligation achieved birth control. At 40, she is happily married and grateful for mother's and family's support. (2) Baby boy born with complex hypospadias had numerous surgeries in early life. In his late teens, required further surgeries to correct multiple urethral diverticulae, strictures and stones. Graduated from University, got married. Currently challenged by oligospermia and fertility issues at 26. (3) Baby born with urethral duplication and genital anomaly. With parental consent, baby was raised as a girl. At age 14, she requested a gender re-assignment. With the support of the parents, the urologist, and the legal system, her request was granted. (4) Baby born with Bladder Exstrophy. Multiple reconstructive surgeries achieved good cosmesis and functionality. At 25, she is in a sexual relationship, carrying out self catheterization with occasional UTIs.
Conclusion: Complex lower urogenital anomalies can present challenges and long term lifestyle adjustments. Parental support, excellent reconstructive surgeries, ongoing urological/medical care in adulthood can produce good results. Patient co-operation and resilience are paramount

UP098

Baseline Sexual Health Inventory for Men (SHIM) Predictive of Erectile Function Following Robot Assisted Laparoscopic Prostatectomy (RALP)

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Introduction and Objective: Preoperative erectile function and age are powerful predictors of erectile function following surgical treatment of clinically localized prostate cancer. We determine if baseline SHIM scores are predictive of erectile function following nerve-sparing RALP.
Methods: Consecutive patients who underwent transperitoneal RALP by a single surgeon (CW) were reviewed. Using an anterior approach, a bladder neck sparing procedure was preferentially performed. Bilateral or unilateral nerve sparing prostatectomy was performed when appropriate. Penile rehabilitation [phosphodiesterase-5 (PDE-5) inhibitor and vacuum erection device (VED)] was offered to all patients. SHIM scores were obtained at baseline, 6 weeks and 3, 6, 9, 12, 15, 18, 21 and 24 months post surgery.
Results: There were 161 consecutive patients identified, of whom 148 (91.9%) underwent nerve sparing prostatectomy [133 (82.6%) bilateral; 15 (9.3%) unilateral] and 13 (8.1%) did not ($p < 0.05$). Of those undergoing nerve sparing prostatectomy, 112/148 (75.7%) had penile rehabilitation. The mean baseline SHIM of patients with nerve sparing prostatectomy and penile rehabilitation was 16.5 ± 8.0. There were 41/112 (36.6%) patients who had baseline SHIM < 15 (mean 7.4 ± 4.5) and 71/112 (63.4%) patients had baseline SHIM ≥ 15 (mean 22.0 ± 3.2). In comparing these patient groups, SHIM postoperatively were similar until the 6 month follow-up interval, where the SHIM diverged significantly. Those with a preoperative SHIM ≥ 15 showed significantly greater improvement in their postoperative SHIM versus those with a preoperative SHIM < 15.
Conclusions: Preoperative SHIM scores are a useful tool in predicting postoperative SHIM scores in men undergoing RALP with unilateral and bilateral nerve sparing plus penile rehabilitation therapy.

Table 1. UP098

	Baseline	6 wk	3 mo	6 mo	9 mo	12 mo	15 mo
SHIM <15	7.4±4.5	3.9±4.5	4.0±5.3	4.2±6.3	6.2±6.7	5.9±7.2	8.2±7.4
SHIM ≥15	22.0±3.4	4.2±5.7	5.6±6.1	8.2±6.5	10.7±7.2	13.3±6.3	13.2±7.5
p-value	<0.001	0.773	0.218	0.012	0.008	0.002	0.015

SHIM = Sexual Health Inventory for Men.

UP099

Should We Support Sural Nerve Graft for Erectile Function During Radical Prostatectomy?

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Introduction and Objective: Sural nerve graft has been proposed as an alternative technique to increase potency after non-nerve sparing or unilateral nerve sparing radical prostatectomy (RP). However, conflicting results have been published and a recent randomized trial in unilateral nerve sparing patients has showed no significant difference. We reviewed our experience with unilateral and bilateral sural nerve graft.
Methods: From 2002 to 2009, 68 patients (pts) with cT2b – cT3a disease underwent retropubic RP with neurovascular bundle wide excision and unilateral or bilateral sural nerve graft by one surgeon (JLC). We analyzed the cohort of 47 who had minimum 2-year follow-up (27 unilateral and 20 bilateral). Pre-and postoperative International Index Erectile Function (IIEF) was recorded, along with use of pharmacologic agents and neo-and/or adjuvant prostate cancer therapies.
Results: Mean age was 61 ± 6.4 years, PSA mean 8.40 ± 6.29 ng/ml. Of our 47 pts, 9 required adjuvant radiotherapy, 3 received neo-adjuvant chemotherapy and 8 had with neo or adjuvant hormone. The overall preop. and postop. IIEF was 23.13 ± 3.75 and 9.88 ± 8.67. When analyzed separately, the preop IIEF for unilateral was 23.75 ± 1.62 and bilateral 22.44 ± 5.02; postop. for unilateral was 9.93 ± 8.64 and for bilateral 9.8 ± 8.70, without statistically significant differences. 12 of 47 (25.5%, 6 bilateral; 6 unilateral) had post-op IIEF >17, 4 of whom require oral agents. Mean age of this cohort was 52.9 yrs and none in this group received adjunctive hormono-, chemo- or radiotherapy.
Conclusions: Although our data do not show overall statistical benefit in IIEF in 47 pts with sural nerve grafts, there may still be justification in offering the procedure to a selected younger cohort whose prostate cancers require unilateral or bilateral wide excision of the neurovascular bundle(s) but where adjunctive therapies are not anticipated.

UP100

Psychosocial, Efficacy and Satisfaction Outcomes Following Tadalafil Once Daily Versus Sildenafil Citrate as Needed Treatment in Men with Erectile Dysfunction

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Introduction and Objective: Successful treatment of erectile dysfunction (ED) that addresses its psychosocial impact remains a challenge. This study compared the efficacy, psychosocial and satisfaction outcomes between tadalafil once-daily (OaD), sildenafil citrate as needed (PRN) and tadalafil PRN.
Methods: This was a global, phase IV, randomised, open-label, active-comparator clinical trial in men with ED who had prior successful PRN phosphodiesterase-5 inhibitor treatment. Patients randomized (N = 378)

Table 1. UP100

Result	Tadalafil OaD	Tadalafil PRN	Sildenafil PRN
PAIRS- Time Concerns	-0.30±0.58	-0.17±0.55	0.0±0.53
PAIRS- Spontaneity	0.10±0.50	0.07±0.49	-0.05±0.49
IIEF - Erectile Function	8.68±6.94	9.54±7.00	9.70±7.01
IIEF - Overall Satisfaction	2.60±2.61	2.84±2.58	2.87±2.55

OaD = once daily; PRN = as needed; PAIRS = Psychological and Interpersonal Relationship Scales; IIEF = International Index of Erectile function.

in the study were 56 years old on average, with 69% reporting prior tadalafil PRN use and 61% reporting sildenafil PRN prior use. Patients were randomised in a 3x3 crossover design; tadalafil OaD, tadalafil PRN and sildenafil citrate PRN. For each 8-week treatment period, the change from baseline to endpoint for Time Concerns and Spontaneity domains of the Psychological and Interpersonal Relationship Scales (PAIRS) and the Erectile Function and Overall Satisfaction domains of International Index of Erectile function (IIEF) were collected (data presented as mean ± SD in table). Comparisons of tadalafil OaD vs. sildenafil PRN and tadalafil PRN vs. sildenafil PRN were made using the least squares mean difference (LS mean ± SE) with a two-sided 95% confidence interval (CI).
Results: The Time Concerns domain score was reduced (-0.31 ± 0.03; CI, -0.36, -0.25; $p < .001$) and the Spontaneity domain score increased (0.15 ± 0.03; CI, 0.10, 0.20; $p < .001$) with tadalafil OaD vs. sildenafil PRN treatment, both of which were statistically significant. The Erectile Function domain score was statistically significantly lower with tadalafil OaD vs. sildenafil PRN (-0.85 ± 0.30; CI, -1.43, -0.27; $p = 0.04$), but not statistically different between tadalafil PRN vs. sildenafil PRN (-0.05 ± 0.29; CI, -0.62, 0.53; $p = .866$). No statistical significance in the Overall Satisfaction IIEF was seen between tadalafil OaD vs. sildenafil PRN (-0.22 ± 0.11; CI, -0.44, 0.00; $p = .055$).
Conclusions: This trial indicates that tadalafil OaD was superior to sildenafil PRN on improving the psychosocial but not satisfaction outcomes in men with ED.

UP101
Initial Experience with the New American Medical Systems Spectra Malleable Penile Implant
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Introduction and Objective: Surgical placement of a 3-piece inflatable penile prosthesis (IPP) remains the gold standard for treatment-resistant erectile dysfunction requiring reconstruction. However, in select cases, patient factors dictate the use of a malleable penile prosthesis (MPP). The AMS (American Medical Systems) Spectra prosthesis is a newly available MPP that has several technical improvements over previous generations of MPP. Placement advantages include cylinder length adjustment, improved balance between rigidity and concealment, and simplified sizing. Erectile function is improved as the device maintains rigid erection without buckling compared to previously available MPPs, and the potential for better cosmetic results. We present initial surgical experience and technical considerations.
Methods: Prospective patient and intraoperative data was reviewed for six patients undergoing Spectra malleable penile prosthesis placement. Patients were identified as candidates for this device, as a 3-piece IPP was not the option-of-choice based on pre-surgical work-up.
Results: Patient age range was 56–68 yrs. Underlying indications for implant surgery included three first-time implants (two diabetic), a replacement for IPP, revision for previous generation MPP, and reconstructive surgery for Peyronie's disease. Penoscrotal incision (with large corporotomies), bilateral lateral distal shaft incisions, and standard subcoronal incisions were utilized as indicated by intraoperative factors. Operative time for lateral approach was 21 minutes; median operative time for other incisional approaches is 32 minutes. IIEF-5 scores increased by 17 +/- 1.9, EHS was 4 for all patients. Prosthetic infections or revision surgery did not occur at 5 month mean follow-up. All procedures were performed as outpatient surgery.
Conclusions: The AMS Spectra MPP offers an improved reconstructive alternative for men not suitable for the IPP, with several technical options for placement; surgery times are approximately one-half hour, and patients are discharged day-of-surgery.

UP102
Efficacy of Intranasal Oxytocin Administered During Coitus for Treatment-Resistant Male Anorgasmia
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Introduction and Objective: It was with interest that we reviewed the report by Ishak et al (J Sex Med 2008; 5: 1022-1024) demonstrating improvement in anorgasmia parameters with treatment by intranasal oxytocin. Oxytocin is a nine-peptide hormone originating from the posterior pituitary gland, and has been shown to impact orgasmic function; half-life is two to three minutes. There is no other series in the literature using this agent for these difficult-to-treat patients.
Methods: A detailed review of anorgasmia history, potential risks and benefits of proposed treatment, and possible alternatives were reviewed for 10 patients. Baseline hormonal profiles were obtained and were within normal range. Patients did not have criteria for other DSM IV conditions. Based on the case report and on basic research findings that oxytocin increases during arousal and peaks during orgasm, patients were consented for off-label use of oxytocin spray. Formulation was 24 IU during intercourse at the point when ejaculation was sought as previously reported; one puff per nostril was utilized for drug delivery.
Results: All patients attempted to modulate anorgasmia on eight different occasions using the metered-dose inhaler for delivery of 24 IU oxytocin. There were no serious side-effects; three patients complained of nasal congestion/runny nose, four had intermittent mild to moderate headache, and one repeatedly experienced an odd taste associated with treatment. One patient noted improvement in the ability to orgasm, although this was inconsistent; the other nine did not demonstrate any improvement in orgasmic function.
Conclusions: This report underscores the need for both positive and negative results in the medical literature to be reported. In this case series, the beneficial effects of 24 IU of intranasal oxytocin during intercourse were not corroborated and placebo effect cannot be ruled out in the initial case report. Further basic and clinical study is warranted for this potential orgasm modulator, or downstream molecular targets to oxytocin.

UP103
Enhancing Men's Health Care: Needs Assessment for Practice-Specific Web-Based Password-Protected Information Prior to Consultation and for Surgeon-Specific Treatments/Procedures
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Introduction and Objective: Within the Canadian healthcare system, delivery of detailed information to the patient is primarily constrained by time limitations. In contrast to United States' web-based practice 'advertising' models, surgeon specific consultation information and treatment/procedure specific information may be of benefit to the patient. This hypothesis was tested in the Men's Health practice, specifically consisting of erectile dysfunction, Peyronie's disease, and low testosterone referrals.
Methods: There were 250 consecutive patients referred to the Men's Health Clinic who were evaluated. Patient needs assessment was performed around the three primary care areas. Metrics included Likert scales measuring importance/priority for various aspects of a web-based delivery system, and data/patient priorities were evaluated and analyzed

with respect to patient age to gain better understanding of potential barriers for use.
Results: Overall usefulness of a password-protected (given only upon confirmed consultation into the practice) website specific to Men's Health practice was 92%. Across decades, consistency was observed at over 96%, with a steep drop-off for men aged 70 years of age and older (n = 36) to less than 30%. Patient priority areas included information about medications and specific treatment options including outcomes and complications, pre and postoperative care outlines, and surgery specific information with illustrations.
Conclusions: Patient needs assessment clearly identifies this web-based model as having potential to enhance Men's Health Care delivery. In addition to patient benefits, a further step may include patient information gathering prior to initial consultation. Thus urologist and patient time efficiencies could be improved; also, access to surgeon-specific information was identified of key benefit, as this could be reviewed throughout any timepoint of the patient care continuum.

UP104

Black and White, or Shades of Grey: The Equivalency of Treatment Modalities for Intermediate-sized Stones

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Introduction and Objectives: Shock wave lithotripsy (SWL) is considered a standard treatment for upper tract stones less than 10 mm in diameter, whereas stones larger than 20 mm are best treated by percutaneous nephrolithotomy (PCNL). The treatment of stones between these sizes remains controversial, as technological advances make ureteroscopy (URS) a viable alternative treatment option.
Materials and Methods: Data from patients treated with SWL, URS and PCNL from June 2005 to June 2009 were reviewed. URS and PCNL were performed by two surgeons in a teaching environment, whereas SWL was conducted by several academic urologists. Analysis was restricted to those patients with a pre-treatment non-contrast CT scan conducted at our centre demonstrating an upper tract calculus measuring an area between 100 and 300 mm^2. Successful SWL and URS treatment of calculi was defined as those patients who were stone free or had asymptomatic, clinically insignificant residual fragments < 4 mm in diameter three months after a single treatment. Successful PCNL treatment of calculi was defined as stone free 2-week post-treatment. Data was analyzed with Chi square analysis and ANOVA where appropriate.
Results: One hundred and thirty-seven patients were referred with non-staghorn calculi with an area between 100-300 mm^2. Across groups, there were 89 males (65.0%), and an overall mean age of 53.1 years (SD 14.2) and BMI of 29.0 kg/m^2 (SD 6.6). Fifty-three (38.7%) patients were treated with SWL, while 41 (29.9%) and 43 (31.4%) underwent URS and PCNL, respectively. Mean stone area was higher in the PCNL group at 211.1 mm^2 (SD 56.8), compared with 172.6 mm^2 (SD 58.2) for the SWL group and 162.9 mm^2 (SD 54.9) for the URS group ($p < 0.001$). Stone density, measured by Hounsfield units (HU) on CT, were significantly higher for SWL patients (1008 HU, SD 244) versus 786 HU (SD 289) for URS and 837 HU (SD 326), $p = 0.002$. Single treatment success rates were significantly better for PCNL at 95.3%, versus 87.8% for URS and 60.4% for SWL, $p < 0.001$. However, when up to two SWL treatments were administered, the success rate improved to 79.2%, thus removing any significant difference between the success of the three treatment modalities ($p = 0.66$). Auxiliary treatments were more common after SWL (42.3%) versus 9.8% and 7.0% in the URS and PCNL groups, respectively.
Conclusions: Although success rates are significantly higher with single treatment PCNL and URS when compared to SWL for intermediate-sized upper tract stones, when allowing for up to two SWL treatments, there was no significant difference between treatment modalities. Thus, SWL is a reasonably successful treatment alternative for patients not fit for or not wishing a general anesthetic, provided they accept a higher number of treatments.

UP105

A Randomized Double-Blinded Clinical Trial of Shock Wave Lithotripsy Voltage Escalation Techniques for Renal Calculi

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Introduction and Objective: The per-shock efficiency of SWL can be affected by the energy setting of the lithotripter, the consumption level of the electrode, and the rate at which shock waves are administered. A recent randomized trial from our unit demonstrated that one method of delayed voltage-escalation did not provide superior stone fragmentation in humans. The purpose of this study was to explore whether a stepwise increase in shock wave voltage, with a more rapid increase than previously used, compared to an immediate voltage increase would improve stone fragmentation and SWL success.
Materials and Methods: One hundred and eighty-eight patients with previously untreated radio-opaque stone(s) located within the renal collecting system, measuring at least 5 mm, were randomized (stratified according to stone size and type of electrode used) to immediate (14 kV to 22 kV rapidly) versus gradual (18 kV for 900 shocks, 20 kV for the next 900 shocks and 22 kV for the remainder) voltage-escalation SWL. Patients were followed with KUB x-rays and renal tomography to assess stone area and stone free status. Primary outcome was success rate, defined as stone-free or adequate fragmentation (sand and asymptomatic fragments <=4mm) at 3 months post-treatment.
Results: Ninety-five patients were randomized to immediate voltage–escalation and 93 patients to gradual. The groups were similar gender distribution ($p = 0.527$), initial stone area ($p = 0.682$), and presence of pre-treatment ureteric stent ($p = 0.363$). 50.5% of the stones in the immediate group were located in the lower calyx vs. 41.9% in the gradual group ($p = 0.238$). There was no difference in 3 month success rate between the treatments (55.8% immediate vs. 65.6% delayed, $p = 0.169$). There were no differences in complications and auxiliary procedures between the two treatments ($p = 0.775$ and $p = 0.265$).
Conclusions: This new method of stepwise increase in voltage-escalation does not appear to provide superior stone fragmentation in humans. While it is possible that modifying voltage escalation techniques can improve SWL outcomes and minimize renal injury, to date there is no confirmatory randomized trial evidence.

UP106

Radiation Exposure During Percutaneous Nephrolithotomy in a Contemporary Series

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Introduction and Objective: Minimizing radiation exposure during urologic procedures has gained importance recently. Traditionally, percutaneous nephrolithotomy (PCNL) has been associated with the highest radiation exposure in endourologic procedures. Therefore, the aim of the present study was to document radiation exposure during a contemporary series of PCNL and to determine factors influencing fluoroscopy time.
Methods: All patients with large renal stones presenting for PCNL between July 31, 2009 and November 20th, 2009 were included in the study. Patient information including age, sex, fluoroscopy time (seconds), operating room time (minutes), stone size (using largest diameter in mm), and stone density measured in Hounsfield Units (HU) were collected prospectively and analyzed retrospectively. Linear regression was used to determine whether fluoroscopy time varied with length of surgery, stone size and stone density.
Results: There were a total of 19 patients, with a median age of 51 yrs old (14 males and 5 females). Median OR time was 85 minutes and the median fluoroscopy time was 317s (5.28 minutes) (range 127–720s). Median stone size was 25 mm with a median of 800 HU. Length of fluoroscopy was independent of the length of surgery ($p > 0.05$) and stone size ($p > 0.05$). There was a trend towards less fluoroscopy time with denser stones (-19s/100HU). However, this did not reach statistical significance ($p = 0.06$). This could be due to the small sample size.

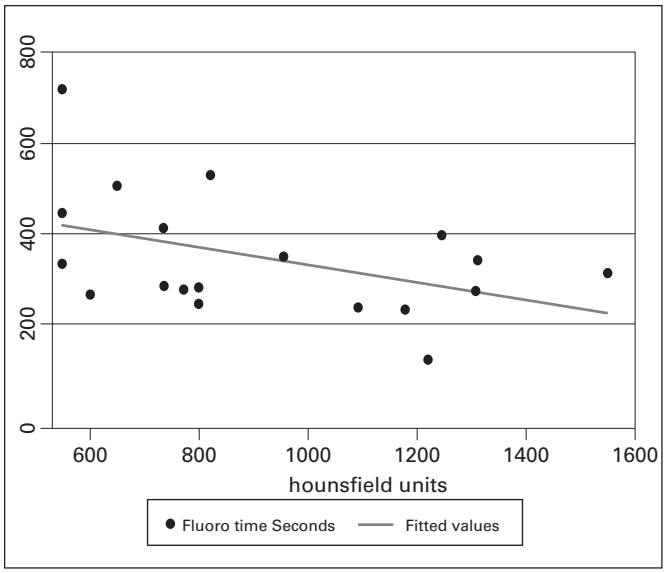

Fig. 1. UP106.

Conclusions: Urologists should be cognizant of radiation exposure during PCNL. More patients are needed to verify whether fluoroscopy times decrease with higher stone densities.

UP107

Incidence of Ureteral Stricture after Repeat Ureteroscopy: A Single Centre Experience

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Introduction and Objective: The incidence of ureteral stricture after a single ureteroscopy is less than 2%. Stone impaction and perforation are risk factors for stricture formation. However, it is unknown if repeated instrumentation and manipulation lead to stricture formation and a higher rate of complication with repeat ureteroscopy. We analyzed retrospectively patients who underwent two or more ureteroscopy or ureterorenoscopy procedures to determine if repeat instrumentation is a risk factor for ureteral stricture.

Methods: We reviewed charts of all patients (n = 67) who had two or more ureteroscopy or ureterorenoscopy procedures on the same ureter/kidney between February 2005 and September 2009. There were 67 patients who underwent 230 retrograde endoscopic procedures for calculi located in the ureter or the kidney. Ureteral stricture was assessed by postoperative imaging or during subsequent procedures by retrograde pyelogram.

Results: Hydronephrosis and ureteral stricture was observed in 4/67 (6%) of patients who underwent repeat ureteroscopy (n = 7) or ureterorenoscopy(n = 60). Three patients (4.5%) who developed a stricture had an impacted ureteral calculus, which was treated with laser lithotripsy. The stricture developed at the site of the impacted stone. Of these patients, two went on to successful balloon dilatation, whereas the third had no resolution stricture. The fourth patient had a history of multiple endoscopic procedures for ureteral calculi elsewhere and records were not available. Patients who had repeat ureterorenoscopy for renal calculi developed no strictures (n = 42).

Conclusions: Repeat ureteral instrumentation during retrograde ureterorenoscopy for renal stones is not a risk factor for ureteral stricture. In contrast, ureteroscopy is associated with subsequent ureteral stricture for long-standing impacted ureteral stones.

UP108

Innovative Camera-free Peritoneal Entry Technique in Urologic Laparoscopy (C-PET)

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Introduction and Objective: Use of the EndoTIP rotational access port (Karl Storz, GMBH) with visual recognition and without prior insufflation has previously been shown to be a safe and efficient technique for obtaining peritoneal access for laparoscopic surgery. An alternative peritoneal entry detection technique using a fluid column instead of a camera lens was evaluated.

Methods: After obtaining ethics approval, we prospectively treated 70 consecutive patients undergoing laparoscopic urological surgery using EndoTIP access without prior insufflation. Patients had no history of abdominal surgery. A fluid column situated within the lumen of the access port was used to detect cavity entry instead of direct visualization of peritoneal penetration through a camera lens. A rapid drop in the column of fluid was used as a marker of peritoneal entry. Primary outcome measures were the success of peritoneal access, the rate of intra-abdominal injuries and entry time.

Results: Following an introductory roll-in phase, 70 consecutive cases were completed with this technique. The Fluid-Column Peritoneal Entry Detection method successfully recognized peritoneal entry in 100% of the cases. No intra-abdominal injuries were observed. Mean access time was 23 seconds.

Conclusions: A rapid dropping fluid column within the lumen of the EndoTIP access port is a practical camera-less technique to detect peritoneal entry during laparoscopic procedures. This novel peritoneal entry method is safe and effective. We hypothesize that this method is safer than current techniques as it excludes the need for visual recognition thereby shortening the learning curve.

UP109

Visually Estimated and Calculated Blood Loss in Robot-Assisted Radical Prostatectomy

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Introduction and Objective: To compare visually estimated blood loss with calculated blood loss using a formula based on body weight and hematocrit to determine preoperative and postoperative blood volume during robotic surgery.

Methods: The charts of 228 patients with localized prostate cancer treated with a robot-assisted radical prostatectomy (RARP) during a 50 month period were prospectively data based with UWO ethics approval. A visual estimate of blood loss for each case was recorded after consensus was reached with the anesthesiologist and the nursing staff. The calculation of blood loss was performed by using the Ganong formula for Blood Volume (Plasma Volume=Body Weight (kg) x 0.045; Blood Volume=Plasma Volume x 100/100-Hematocrit).

Results: Mean age was 59.8 years, ± 6.9 (SD), BMI was 27.9 ± 3.5, operative time was 259.7 minutes ± 44.4, mean PSA 6.6 ± 3.0, clinical stage was T1 in 171 patients (75%), and T2 in 57 patients (25%); preoperative HCT 0.44 ± 0.03, preoperative HGB 149 ± 10.5, postoperative HCT 0.35±0.03, postoperative HGB 119.2±12.2, preoperative blood volume 6.9 ± 1.1cc, postoperative blood volume 5.9 ± 1.0cc, estimated blood loss 251.2 ± 243.2cc, calculated blood loss 930 ± 370cc, and only one patient transfused. The correlation of the Spearman's rank order was low (0.27), showing a poor correlation between calculated blood loss and estimated blood loss.

Conclusions: The standard procedure of visually estimating surgical blood loss was found to be unreliable and should be used with caution in robotic surgery. There is a need to improve the methods for calculating blood loss so we can recognize patients at risk for hemorrhage-related complications.

UP110

Stray Electrical Currents in Laparoscopic Instruments used in DaVinci Robotic Surgery

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Introduction and Objective: The use of the DaVinci robotic surgical system in laparoscopic procedures has gained wide acceptance and popularity across all surgical disciplines. This system however requires the utilization of monopolar electrosurgery and a finite reuse of electrosurgical instruments both of which provide opportunities for stray electrical currents from capacitive coupling and/or insulation failure. We report the prevalence and magnitude of such stray currents measured in DaVinci instruments that had reached the end of their duty cycle.

Methods: We tested 30 such instruments, 6 monopolar scissors, 1 Maryland bipolar forceps, 1 monopolar hook, 5 plasma kinetic dissecting forceps, 7 prograsp forceps, 10 large needle drivers using a Valleylab Force 2 ESU at pure coagulation and cut waveforms in open circuit at 4 different settings (open air) at 40 w, and sequentially gel coated instruments at 40 w, 80 w and maximum ESU output (coag 120 w, cut 300 w). The magnitude of stray currents was measured by an electrosurgical analyzer (454A Dynatec, Nevada). Visual inspection did not identify insulation defects in any of the instruments.

Results: At coag waveform in open air, 86% of instruments leaked a mean of 0.4 w (0-0.7 w). In the presence of gel coated instruments, stray currents were detected in all instruments with means and (range) of 4.2 w (1.5-7.7), 5 w (1.8-9.7), and 5 w (1.9-10.5) at 40 w, 80 w and 120 w, respectively. At cut waveform in open air, none of the instruments leaked current, while gel coated instruments leaked a mean of 2.7 w (0.6-4.3), 2.7 w (0.8-8.2) and 4 w (1.6-8.2) at 40 w, 80 w and 300 w, respectively. Compared by instrument group, the highest leakage was in PKDF (mean 4.1 w, one > 8 w), followed by LND (3.3 w), PF (2.8 w), MBF (2.4 w), MCS (2.3 w), and MH (1.1 w).

Conclusions: At the end of their life cycle, all tested instruments showed energy leakage with one over 8 w, at > 80 w of ESU power. Stray currents were higher during coag waveforms and the magnitude was not always proportionally related to ESU settings. Such stray currents may cause electrical burns to patients and/or operating room personnel.

UP111

Application of Ice Cold Irrigation during Vascular Pedicle Control of Radical Prostatectomy: EnSeal Instrument Cooling to Reduce Collateral Thermal Tissue Damage

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Introduction and Objective: Energy-based hemostasis at the prostatic vascular pedicles (PVP) during robot assisted radical prostatectomy (RARP) may cause collateral thermal injury to adjacent neural tissue and has been shown to negatively impact sexual function recovery. The unique engineering design of the Enseal® (Ethicon, Cincinnati,OH) has been demonstrated to limit collateral thermal tissue damage to <1.0mm. Use of tissue and instrument cooling prior to, and during device activation may potentially further reduce thermal spread. As such, we sought to evaluate the collateral tissue effects of Enseal®, with or without cold-saline irrigation (CSI), during PVP control.

Methods: The Enseal® Trio device was used for PVP control in 20 consecutive men undergoing bilateral, non-nerve-sparing RARP. Ipsilateral vascular pedicles were randomly selected to Enseal® + CSI (<4°C) application to the tissue before and during device activation or Enseal® alone. The primary endpoint was the distance of thermal injury from the inked margin using both hematoxylin/eosin and TUNEL-apoptosis staining. A mean of 3 measurements were taken for each pedicle. Pathological analysis was performed by a single, blinded uro-pathologist.

Results: Mean distance of thermal injury from the inked margin was 0.31mm (range 0.15-0.40) and 0.97mm (range 0.8-1.1) for the Enseal® + CSI and Enseal® alone, respectively ($p < 0.0001$). TUNEL staining also demonstrated lateral tissue damage of 0.39mm (range 0.2-0.5) and 1.12mm (range 0.9-1.3), respectively. No complications related to hemostasis or postoperative bleeding was observed in the study.

Conclusions: The hemostatic properties of Enseal® work effectively when submerged in CSI. Adjacent thermal tissue damage is significantly minimized with the addition of CSI. This may have a beneficial impact for nerve preservation and sexual function outcomes following RARP.

UP112

Teaching of the Male Urogenital Exam in Medical School: Are our Students Appropriately Prepared for Practice?

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Introduction and Objective: Performing the male urogenital examination is an important part of medical education. Unique challenges exist regarding teaching and learning of intimate physical examinations and limited time is generally available for urology rotations in medical school curriculum. We sought to determine if senior medical students across Canada are confident in performing the basic male urogenital examination and interpreting examination findings.

Methods: Final year students at 17 Canadian Medical Schools were invited to participate in the study. A validated, anonymous online survey was used to assess participant's confidence in performing various aspects of the male urogenital exam. Student gender, involvement in urology rotations and medical field of interest were analyzed.

Results: Responses from 239 students from 8 Canadian Medical Schools were analyzed. While the majority of participants were confident in performing a digital rectal exam (76.9%), approximately only half were confident performing a testicular exam (52.7%) and identifying hypospadias (54.2%) or inguinal hernias (59.1%). However, the majority of participants were not confident in identifying a mass on testicular exam (58.9%), a nodular prostate (66.5%) or enlarged prostate (59.7%), hydrocele (61.1%), varicocele (70.2%) or paraphimosis (61.8%) (Fig.1) (Table 1) (Table 2). Having completed a rotation in urology ($p < 0.03$) and a desire to pursue a career in urology ($p < 0.01$) are significantly associated with increased participant confidence, while gender and desire to pursue a career in family medicine were not important factors in confidence ($p > 0.05$).

UP113

The Design and Integration of a Novel Online Problem-Based Learning Resource to Enhance Urology Medical Education

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Introduction and Objective: In order to bridge the gap between preclinical knowledge and the clinical approach to common urologic conditions, the University of British Columbia (UBC) Department of Urologic Sciences (DUS) created an online library of Problem-Based Learning (PBL) cases. This is particularly important as not all students complete a urology rotation during their clerkship years.

Methods: The cases were written and edited by medical students and reviewed by urology residents and faculty. Using a comprehensive template, students authored cases that simulate a clinical encounter. Cases were developed in a pedagogical manner to provide a systematic review of clinical presentations, patient assessment and treatment. Cases also had supplemental questions and comprehensive explanations to facilitate critical thinking. The cases were published online using Diagnosis X, a collaborative project between UBC, the Molson Medical Informatics Institute, and McGill University. This technology allows learners from all UBC distributed medical sites access to the cases.

Results: In 2008, the FERGU block (Fluids, Electrolytes, Renal, and Genitourinary) of 1st year medical curriculum was augmented with 4 sup-

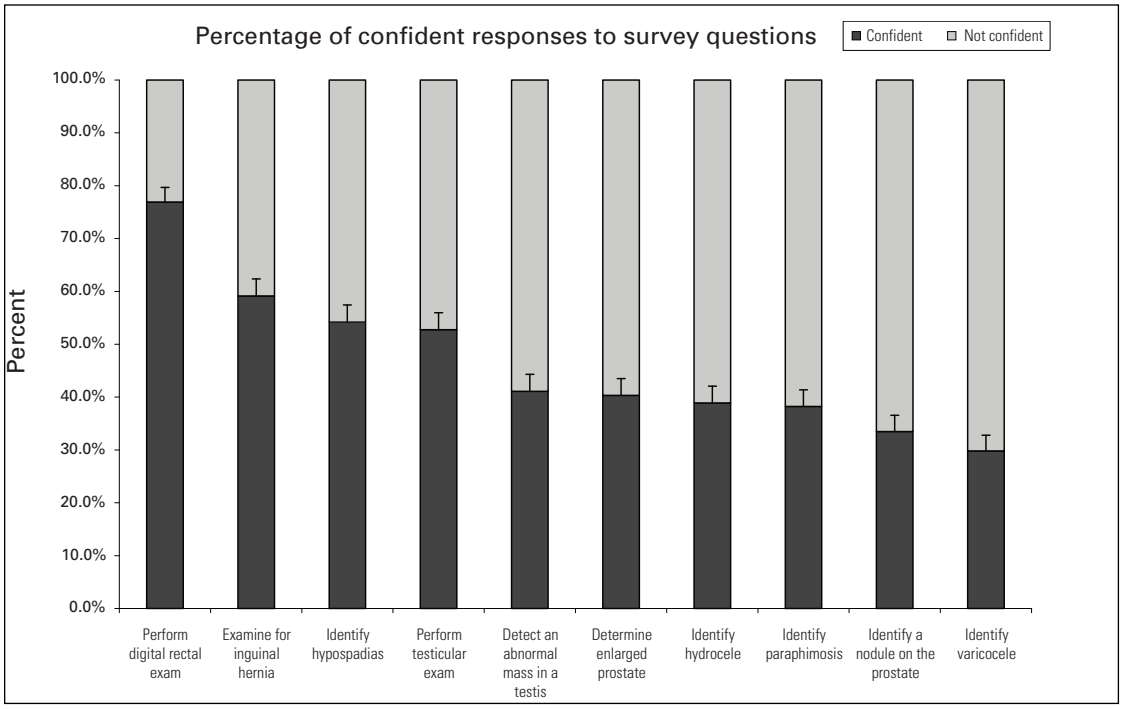

Fig. 1. UP112. Percentage of confident responses to survey questions.

Table 1. UP112

	Perform digital rectal exam	Examine for inguinal hernia	Identify hypo-spadias	Perform testicular exam	Detect an abnormal mass in a testis	Determine enlarged prostate	Identify hydrocele	Identify paraphimosis	Identify a nodule on the prostate	Identify varicocele
Confident	76.9%	59.1%	54.2%	52.7%	41.1%	40.3%	38.9%	38.2%	33.5%	29.8%
Not confident	23.1%	40.9%	45.8%	47.3%	58.9%	59.7%	61.1%	61.8%	66.5%	70.2%
SEM	0.028	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.030

Table 2. UP112

	Frequency (%)
Strongly agree	135 (57.2)
Agree	96 (40.7)
Disagree	1 (0.4)
Strongly disagree	1 (0.4)
Don't know	3 (1.3)
Total	236

plemental PBL online cases. An additional 66 cases on a variety of urological topics are available for interested students at all levels of training. Approximately 35% of the 1st year class accessed the 4 suggested cases and 40% of those individuals reported that the online cases enhanced their understanding of the clinical approaches to common urologic problems. In 2009, 24% of students completed the same survey at the end of the block with 41% saying the cases had a positive impact on their learning.

Conclusions: Online cases can serve as a useful supplement to didactic teaching and enrich student understanding. In future, we plan to further integrate Diagnosis X as a supplemental resource in FERGU while we continue to improve and enhance the diversity of the online cases. This year we have begun supplementing the cases with videos outlining relevant urologic procedures which will hopefully further improve learning. These will also provide exposure to urologic procedures for those

students who are unable to complete a urology rotation. Following DUS's lead, other UBC departments including Pediatrics, Family Practice and Psychiatry have begun similar projects. Integrating and enhancing such study tools can provide an extensive learning resource to medical professionals at all levels.

UP114

A Novel Online Video Resource to Enhance Urology Medical Education

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Introduction and Objectives: In order to meet growing healthcare demands in the province, the University of British Columbia (UBC) launched a distributed medical education program in 2004. This initiative doubled the undergraduate class to 256 students while providing clinical training opportunities across the province. However, with the increase in students, opportunities to complete a urology rotation during clerkship years have been significantly reduced. As a result, many students lack exposure to key urological procedures in the operative setting. Recently, the UBC Department of Urological Sciences, in partnership with the Office of Pediatric Surgical Excellence and Innovation, developed an online educational video resource to increase medical students' exposure to and understanding of key urological procedures.

Methods: A team of 13 UBC medical students was recruited to produce educational videos as a summer project under the guidance of Urology residents and faculty. Key urological procedures were identified and after patient consent was obtained, the procedures were recorded using an HD camcorder or through direct endoscopic video. Once captured, each video was edited to last 6 to 8 minutes with the goal of highlighting the materials used, identifying important anatomical landmarks, explaining the key surgical steps and discussing the indications, contraindications and potential complications of each procedure. The videos were then published onto a secure Internet-based server to allow students from all distributed sites access to the videos at any time.

Results: A total of 10 videos that met the above criteria were produced and published online. These demonstrate ureteroscopy, cystoscopy, suprapubic catheterization, female catheterization, varicocelectomy, circumcision, pyeloplasty, bilateral hydrocele repair, laparoscopic partial nephrectomy, and robotic-assisted radical prostatectomy. Furthermore, interest in the project from other surgical specialties resulted in the production of 10 non-urological videos.

Conclusion: In conclusion, the collaboration between students and urology faculty can result in the successful production of educational videos outlining key urological procedures. Future plans include (1) the continued expansion of the project with additional videos, (2) linking of pertinent videos with online Problem Based Learning urology cases developed at UBC, and (3) completion of a study assessing the efficacy of online video in medical education.

UP115

Improving the Live Renal Donor Transplant Experience

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Introduction and Objective: Currently, 4000 Canadians are on the organ transplant waiting list, 75% of which are awaiting kidneys. Current literature focuses on transplantation *after* surgery, with generally favourable results (particularly for quality of life) – however, this information does not shed light on the experience *during* and *following* the donation process. Existing studies have measured positive quantitative health and psychological outcomes of kidney donation, but have not focused improving donation procedures or management of donor expectations. Our objective was to illustrate the transplantation experience from a live kidney donor's point of view, identify areas of concern, and suggest steps for improvement. This was done by analyzing positive and negative aspects *during* and *following* the donation experience.

Methods: Ten renal transplant donors in BC were interviewed during a postoperative appointment. All surgeries were done by a single surgeon, in conjunction with BC Transplant. Interview questions focused on donor experiences during the initial compatibility work-up, on the surgery day, and up to several months post-surgery. Further information was elucidated in areas of: health (physical health, mental/emotional health [pre- and post-donation]), relationships (personal and professional), and the overall donation process. Transcripts were read three times, and common trends and categories were identified via the grounded theory of inductive approach.

Results: Nine of the ten donors felt so strongly and positively about the importance of the donation process that they would do it again and/or recommend siblings or relatives to donate. *Successful areas of support and services noted by donors included:* flow and coordination of the donation process, Transplant Agency support, caring staff, finances, and employer social support. *Areas of concern for donors included:* physical recipient-donor recovery reunion, pain control, management of expectations of post-surgical physical outcomes, and fatigue levels.

Conclusions: From these results, we identified modifiable and non-modifiable donation variables, and specific reasons for positive and negative experiences at each donation stage. In addition to *recommending the continuing use of the identified beneficial services*, we *propose specific solutions to address each area of concern*. These include (but not exclusive to): a greater effort to facilitate recipient-donor recovery reunions (physical or videoconferencing), developing a pain management protocol, and better informing of the fatigue extent. Notably, these results have widespread application to all transplant societies, not necessarily solely kidney transplantations, nor those confined to BC – and can be used to improve the live donation experience.

UP116

Early Experience with Robot Assisted Laparoscopic Donor Nephrectomy

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Introduction and Objective: Robot assisted laparscopic donor nephrectomy has been performed at our institution since Dec 2007. The objective of this study is to quantify operative and perioperative metrics of robot assisted donor nephrectomy and associated complication rates. We describe our initial experience as well as benefits and drawbacks of this approach. We specifically quantify operative time; donor kidney warm ischemic time; intraoperative and perioperative complications in addition to return to ambulation and removal of parenteral analgesia.

Methods: Data acquisition was completed with a retrospective chart review of 9 living related donor patients between Dec 2007 and July 2008. Patients were excluded only if patient records were not available for review.

Results: Nine patient charts were available for review. Mean (standard deviation) patient age was 45.7 (9.2) years. Six female and 3 male patients were included. Transperitoneal left side nephrectomy with a single renal artery and vein was performed successfully in all cases. Mean operative time was found to be 229 (30.7) minutes with a warm ischemic time of 3.4 (1.9) minutes. Estimated blood loss was 94.4 (115.7) ml. Mean hospital stay was 2.8 (1.0) days and time until removal of parenteral analgesia was 2.3 (1.2) days. Patients were ambulatory after a mean of 1.2 (0.5) days. The 24 month patient survival was 88% and the 24 month graft survival was found to be 77%. No incidence of acute graft rejection or delayed graft function were encountered. One suspected bowel injury occurred during placement of a Veress needle. No other significant intraoperative or perioperative complications occurred.

Conclusions: Similar metrics of operative and warm ischemic times; hospital stay; perioperative and intraoperative complications were found with the robot assisted laparoscopic donor nephrectomy compared to the conventional laparoscopic approach. Our initial experience did not demonstrate significant improvement over the laparoscopic approach, but we

remain limited in our experience. Opportunity for development of the robot assisted donor nephrectomy application includes retroperitoneal approach to the kidney as well as complicated left sided vascular anatomy.

UP117

Long-term Analysis of Post-Renal Transplant Donor Outcomes: Donor Recovery

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Introduction and Objective: While benefits of living donation over cadaveric donation for recipient outcomes have been well documented, living donor outcomes have not been fully evaluated. We have observed anecdotally decreased donor energy in long term post surgical follow-up and currently, no study has investigated donor characteristics on donor energy recovery. In this study, we examine donor parameters in the context of donor energy recovery.

Methods: A retrospective single institution chart review was conducted on kidney donors who underwent donor surgery by a single surgeon (n = 97). The study period was between 2006 and 2009 and energy ratings were reported as a percentage compared to pre-donation energy. Energy levels were recorded at 2 weeks, 1 month, 3 months, 6 months, 12 months and 24 months post surgery. The two sample equal variance Student's t-test was used to determine whether various donor characteristics had an effect on energy recover post surgery. Donor characteristics included age, blood type, body mass index (BMI), gender, length of stay, patient-controlled analgesia (PCA) or Toradol use, race, recipient relationship and seasonal effects. A *p*-value of less than 0.05 was used to indicate statistical significance.

Results: With an average 2-week energy level of 74.5%, most donors had returned to 100% pre-donation energy within 1 year post surgery (1 year average = 97.7%). No significant difference in donor energy recovery was found in any of the donor characteristics of age, blood type, BMI, gender, length of stay, PCA or Toradol use, race, recipient relationship or seasonal effects. However, with age split into tertiles, the youngest age group had significantly higher energy levels than the other two age groups at 1 month and 6 months.

Conclusions: Donor energy level was a composite marker for post-surgical donor recovery, which can be affected by various donor characteristics. Our study found that the donor energy recovery profile resembled a curve with most of the donors returning to 100% pre-donation energy within 1 year post surgery, and that none of the donor characteristics investigated significantly affected donor energy recovery. Though the youngest age group showed significantly higher energy levels, further research is required before conclusions can be drawn.

UP118

Combined Robotic Assisted and Laparoscopic Ileal-Neovaginal Construction

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Introduction and Objective: We describe our initial experience with robotic assisted and
laparoscopic ileal-neovaginal construction (LINC), and provide information on surgical indications, surgical technique, and functional outcomes.

Methods: Medical records were retrospectively reviewed for patients undergoing LINC. A combination of robotically assisted and pure laparoscopy is used to dissect the vaginal plate in the pelvis, isolate/dissect/create the ileal neovaginal segment, and re-establish ileal continuity. A transperineal port placed through the area of the neointroitus is used for surgical assistance. The neovagina in sutured to the hymenal area after dissecting an adequate diameter neo-introitus and a neovaginal drain is placed.

Results: Five females (mean age 29) underwent LINC during 2008-2009. Surgical indications were a) Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome (n = 3) b) severe vaginal stenosis after multiple vaginal procedures (n = 1) and c) post radiation vaginal atrophy for pediatric pelvic rhabdomyosarcoma. Four cases were completed successfully. One of these was converted to open after a rectal injury. One case was aborted due to extensive pelvic scarring as well as unfavorable anatomy; this patient also had a bladder injury repaired primarily. Mean follow up was 12 months (2–20 months). Postoperatively, 4/4 neovaginas had adequate vaginal depth and introital diameter. Perineal cosmesis is acceptable to all. Overall: 4/4 subjectively patients are satisfied with the result; 3/4 patients have had successful intercourse with no pain; 1/4 patients has not been sexually active as her surgery was performed recently; 1 patient needed release of annular adhesions at the anastomosis of native to ileal neovagina. All report no excess neovaginal mucous production. One patient had a postoperative ileus that resolved with conservative management.

Conclusions: Combined robotic assisted and pure laparoscopic ileal-neovaginal creation is a viable option for those with primary or secondary vaginal insufficiency and it provides excellent early functional and cosmetic results.

UP119

Outcome of Vessel-Sparing Excision and Primary Anastomosis for Bulbar Urethral Strictures

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Introduction and Objective: We have previously reported on our technique of vessel-sparing excision and primary anastomosis urethroplasty (VS EPA) for proximal bulbar urethral strictures. This paper will address and evaluate the outcomes and complications of VS EPA.

Methods: Twenty-four patients underwent VS EPA for bulbar urethral strictures between 2005-2009. Their charts were retrospectively reviewed. Failure was defined as recurrent stricture requiring intervention. Three weeks post-surgery patients underwent voiding urethrography. Flexible cystourethroscopy is performed 6 months after surgery. An 18 month office appointment is scheduled, with a yearly follow-up thereafter. Long term follow-up relies mainly on patient symptoms, while diagnostic procedures such as urethroscopy and/or retrograde urethrogram are done selectively.

Results: Mean age was 42 years. Stricture etiology was idiopathic in 14 (58%), perineal trauma in 4 (17%), pelvic fracture distraction injury in 4 (17%), instrumentation in 1 (4%) and congenital in 1 (4%). Mean follow-up averaged 48 weeks (range 12 to 237 weeks). Mean stricture length was 2.25cm (range 1.5-4.5). 19/24 (79%) had previous treatment procedures, with 13/24 (54%) having had dilations and 13/24 (54%) having urethrotomy, 0/24 previous urethroplasty, 14/24 (58%) had >/= 2 previous treatments before referral to our centre. 24/24 have been successful with no further interventions needed. One patient has a stable 18F annularity being monitored. One patient that previously underwent transurethral prostatectomy had stress incontinence and underwent male sling. No significant perioperative complications occurred.

Conclusions: Vessel sparing excision and primary anastomosis for proximal bulbar urethral strictures has a high success rate up to 4 years after surgery. Longer-term follow up data is still needed.

UP120

The Urachal Flap: A Previously Unreported Tissue Flap in Vesicovaginal Fistula Repair

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Introduction and Objective: Tissue interposition is imperative for the successful repair of complex vesicovaginal fistulae (VVF). The most common flap used in a transabdominal VVF repair is the omental flap, which in many cases can not be used. The urachus is well vascularized tissue that is easily mobilized for interposition. We describe our experience using a urachal-perivesical peritoneal flap as the interposed tissue in VVF repair.

Methods: Patients undergoing VVF repair at our centre were identified. Retrospective chart review was performed for those that underwent transabdominal VVF closure with interposition of a urachal flap. Patients were left with a Foley catheter and a drain. Cystogram was performed 2 weeks post-op to confirm fistula resolution, prior to Foley removal.

Results: Twelve patients were identified. All were evaluated with a history, physical, upper and lower tract imaging and cystoscopy. Vaginal pad dye tests were occasionally employed. Urodynamics were performed in those with urinary incontinence. Median patient age was 49 years (31 to 88). Fistula etiology was hysterectomy in 10 and prolapse repair in 2. Three patients were diabetic; none had pelvic radiation or local cancers. Five patients had failed previous repair. Fulguration of the fistula tract had failed in 2 patients. Eleven of twelve patients had successful repairs with no recurrence of fistula. One patient had a postoperative wound infection. Another patient had respiratory issues requiring short term ventilation. Two patients had preoperative and postoperative complaints of stress urinary incontinence that was mild and did not require surgery.
Conclusions: VVF is a complex issue for reconstructive surgeons to address. The urachal flap is a well vascularized tissue flap that can be easily mobilized and interposed for VVF repair. In this series, 11 of 12 patients with VVF were successfully repaired using this technique. We continue to employ this technique and feel that further evaluation and usage of this flap indicated.

UP121

Transperitoneal Laparoscopic Pyeloplasty in Adult Population: Our Three-Year Experience in Northern Ireland

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Introduction and Objectives: We aim to present our initial series on transperitoneal laparoscopic pyeloplasty (TLP), to evaluate technical feasibility, complications and outcome of the procedures performed in Northern Ireland.
Methods: We reviewed the records of TLP patients between 01/01/2006 and 31/12/2009. Outcome was measured using objective symptom improvement and MAG 3 renogram at six monthly intervals for the first postoperative year, and then annually thereafter if indicated.
Results: Anderson-Hynes pyeloplasty was performed in 29 patients and Fengers pyeloplasty was carried out in one patient. Men operative time was 180 minutes (120-360). Mean blood loss was 163 mls (0-380). Neither blood transfusion nor conversion to open surgery was required. Median hospital stay was 3.2 (2-13). In 29 (97%) patients the procedure was successful. One patient required nephrectomy for persistent pain and poor ipsilateral renal function despite objective evidence of resolution of the obstruction.
Conclusion: Our outcome of TLP is similar to similar experiences in other centres and it has comparable success rate compared to open procedures. With experienced surgeons, laparoscopic pyeloplasty should be the procedure of choice in treating pelvi-ureteric junction obstruction.

UP122

Composix-based Sling in Comparison to TVT and TVT-O at a Median Follow-up of 24 Months

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Introduction and Objectives: Suburethral synthetic sling procedures have become widely used as surgical treatment for female urinary stress incontinence. However synthetic slings are expensive. Since 2002, we have used in a non-randomized fashion, Composix-based slings, tension-free vaginal tapes TVT and transobturator tapes TVT-O. The Composix sling was cut from a large sheet used for ventral hernia repair and resterilized. The Composix sling was fitted with 0 Maxon resorbable sutures on each side and positionned suburethrally with a Raz needle introduced though a small suprapubic incision. The goals of this prospective study are to compare the success rate, the durability, and the complications of the three different approaches.
Methods: Among the 103 women suffering from stress incontinence, 60 were assigned to Composix, 21 to TVT, and 22 to TVT-O. Only patients presenting a complete set of data were included in the analysis. Preoperative workups included medical history, clinical examination, a 24-h pad test, FPSUND (symptom score), satisfaction and impact incontinence quality of life (I-QOL) questionnaires. Objective changes in SUI were the primary end point; whereas other outcome variables such as symptoms, quality of life questionnaires and satisfaction scale were our secondary end points. Clinical check ups were conducted at 3 month, each 6 months for 2 years and then annually up to 5 years. The objective result was considered successful when the absolute value of incontinence after treatment was <2 g per 24 hours.
Results: The median follow up of the cohort was 24 months. The median I-QOL scores for the Composix, TVT and TVT-O prior to surgery were 57, 55, 49 respectively, and 106, 106, 109 at 24 months. Similarly, the FPSUND scores were initially 12, 11, 12 and 4, 1,2 at follow-up, whereas the 11 point-scale satisfaction score improved from 2 to 9 for all groups. The median pad weight was 26g, 66g and 20 g prior to surgery; at 24 months all patients who had not failed in the first 6 months were dry.
Conclusions: No statistically significant difference in the objective outcome among the three modalities at a median follow-up of 24 months. Improvement and maintenance of subjective outcomes was similar over at least 2 years. The rate of complications was comparable.

UP123

Patient Perceptions Regarding Post-Prostatectomy Incontinence and Treatment Options: An Online Survey

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Introduction and Objective: Post-prostatectomy incontinence (PPI) rates vary widely in the literature following radical prostatectomy, depending on how incontinence is defined, patient versus physician reported rates, and whether subjective or objective measurement tools are used. Patient PPI concerns, perceptions, and knowledge of the treatment options are not well known. An online questionnaire was administered to evaluate these factors in patients who have undergone a prostatectomy.
Methods: The survey was conducted in November 2007 in conjunction with Us TOO. Invitations were sent to 10,497 email addresses in the "Us TOO Prostate Cancer NEWS You Can Use" newsletter. There were 940 respondents who agreed to participate. Of these, 271 had urinary incontinence and continued. No incentive was given to the patients to participate.
Results: There were 77% of patients between 56 and 75. Of the patients, 80% had their prostatectomy > 1 year ago. There were 22% of men who indicated that they did not know that incontinence was a complication of surgery, and 65% indicated current PPI. It was stated by 39% of patients that PPI has a major impact on quality of life, 34% state it affected relationships, and 50% state they would do anything to cure it. There was 74% of patients who have discussed their condition with an MD, 70% of these were urologists. Only 29% of the time the physician initiated the discussion. 25% were familiar with the artificial urinary sphincter (AUS) and 19% viewed it favorably.
Conclusions: PPI continues to be a significant problem for patients. This online survey indicates the need for improved communication regarding PPI and its treatment with our patients. Online surveys can be effective and more time and cost effective than other survey methods.

UP124

Community Treatment of Stress Incontinence with Pubovaginal Slings

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Introduction and Objectives: To review the success rate of pubovaginal slings (PVS) for women with stress incontinence in the community setting.
Method: This retrospective study involved 774 consecutive female patients who underwent a PVS from 2005 to 2009. All charts were reviewed for elimination of stress incontinence, urgency and frequency, and post-op residual urine. These PVS were performed by four surgeons in a group practice. 587 were performed using the suprapubic approach (3 surgeons). The remaining 187 were performed using the retropubic kit (1 surgeon). Patients removed their own catheter between 20 – 30 hours post-op. All patients were followed for at least 4 months.

Results: The median age of patients was 50. Outpatients accounted for 99.8% of the sample. Suprapubic approach resulted in 91% complete continence within 5 weeks, increasing to 93% over 4 months; 5.4% of patients had mild wetting but did not require pads. Retropubic approach resulted in 94% complete dryness at 1 week, decreasing to 87% over 4 months.

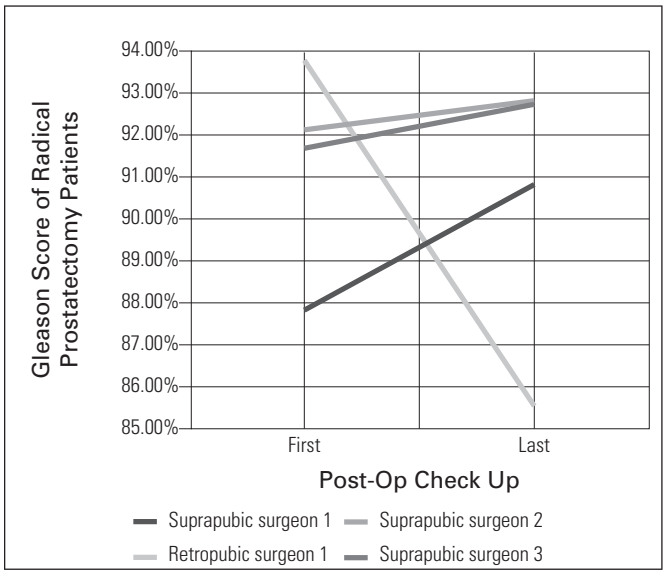

Fig. 1. UP124.

Across all surgeons, postoperative urgency decreased from 31% to 23% over 4 months. Of the 116 patients that were followed for over a year, 94% remained pad free. Of the 7 patients who required protection, 5 were patients of the retropubic approach. Of the 31 patients that were followed for over two years, 94% continued to be pad free. The suprapubic approach yielded a 0.9% occurrence rate of prolonged (4+ months) post-void residuals in excess of 200 cc. The retropubic approach yielded a 3.5% occurrence rate.

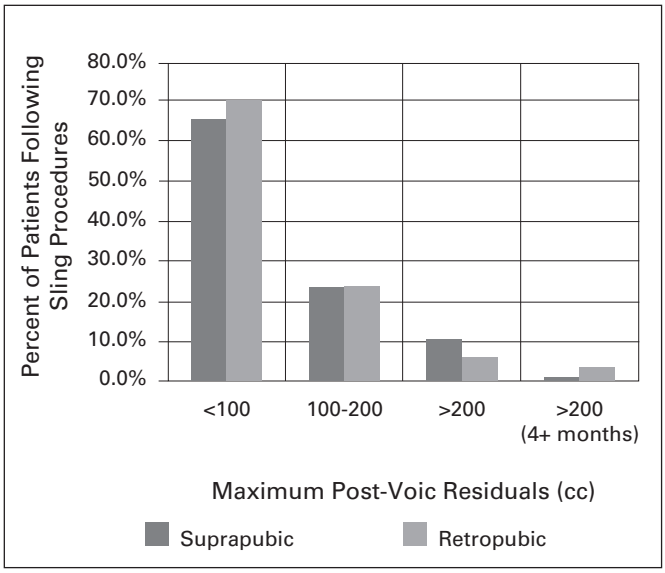

Fig. 2. UP124.

Conclusions: PVS is highly effective in eliminating stress incontinence. Postoperatively, once a patient has been pad free for 6 months there is a 94% chance they will remain pad free long term. The suprapubic approach seems to have a higher long term success rate than the retropubic approach, the latter of which has also shown a higher post-void residual.

UP125

Use of the "Deep Scrotal Retractor" Improves Visualization and Cuff Placement During Transverse Scrotal Placement of an Artificial Urinary Sphincter

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Introduction and Objective: Placement of an artificial urinary sphincter (AUS) is a well recognized and effective treatment option for men with urinary incontinence. Use of a transverse scrotal incision to place the AUS allows easy placement of the activation pump and the pressure regulating balloon, but some have criticized the approach feeling that it does not allow proximal cuff placement, with resulting decreased efficacy of the device. Size of the cuff implanted has been seen as a direct reflection of position of the cuff on the urethra, and, specifically, implantation of a 4.0cm cuff has been seen as evidence of a cuff that is not located on the bulbar urethra. We describe a novel retractor system, the "Deep Scrotal Retractor", which allows improved visualization and dissection, and hence proximal cuff placement, during the transverse scrotal placement of an AUS.

Methods: We adapted a connecting clamp and retractor blade from a Balfour retractor, for use during trans-scrotal AUS placement. The clamp fits onto the inferior ring of a Scott retractor allowing a deep, self retained retractor blade in the scrotum. We reviewed operative notes and compared size of the implanted cuffs from transverse scrotal AUS placements before and after the introduction of the Deep Scrotal Retractor modification.

Results: In the 12 patients evaluated prior to routine use of the Deep Scrotal Retractor, 2 had cuffs 4.5cm or larger implanted (17%), and 10 had 4.0cm cuffs placed (83%). Since the adoption of the Deep Scrotal Retractor, 7 patients have undergone transverse scrotal AUS placement; 4 had a 4.5cm or larger cuff implanted (57%) and 3 a 4.0cm cuff (43%). Retraction and visualization were superior when the deep, self retained blade was used, allowing dissection more proximally on the urethra. In all 7 cases when the Deep Scrotal Retractor was used, the bulbospongiosus muscle was visualized to its full extent and divided prior to cuff placement.

Conclusions: Use of the Deep Scrotal Retractor allows improved visualization during transverse scrotal placement of an AUS, and this improved visualization allows improved dissection on the urethra and placement of the cuff in a more proximal location as evidenced by larger cuff size implanted. This novel system is well-suited to AUS and combined single incision inflatable penile prosthesis/AUS procedures.