Poster Session 5: Education, Technology and Basic Science
June 29, 2015, 0715-0845

MP-05.01
2015 Prize Essay Winner: Basic Science
Optimization of the current self-assembled urinary bladder model: Organ-specific stroma and smooth muscle inclusion

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Introduction and Objectives: Urinary bladder is subjected to many congenital and acquired diseases requiring replacement. Bioengineered tissue is required for vesical reconstruction and in vitro modeling of pathologies. Self-assembly method of matrix formation using autologous cells can obviate the need for using non-native tissues or exogenous materials. We have previously developed a urinary bladder model composed of dermal fibroblasts and urothelial cells. We thought that stromal cells from vesical lamina propria would give rise to ECM with many characteristics similar to that of native urinary tissues. In this study, we aimed at creating ex-vivo, a urinary bladder tissue model obtained from the different cell types of urinary bladder.

Methods: Urothelial (UCs), bladder stromal (BSCs) and smooth muscle cells (SMCs) were isolated from bladder biopsies using surgical and enzymatic methods. Different cells were expanded and their phenotype was confirmed. BSCs were stimulated under influence of ascorbic acid to form collagen sheets in a 4 weeks period. Following this, SMCs and UCs were sequentially seeded. Bladder equivalents were collected and subjected to histological and functional studies. They were assessed by immunohistochemical and histochemical staining for cell identification, proliferation and morphology and for tissue architecture. Permeability and biomechanical tests were performed.

Results: BScs were able to form collagen sheets that could be handled easily. UCs constituted a well-organized, differentiated epithelial layer as evidenced by positive staining for pancytokeratins. Markers for impermeability including uroplakins and E-cadherin were detected. A well-formed basement membrane was identified with laminin and collagen IV. SMCs markers were positive for smooth muscle actin, calponin and smoothelin. Permeability test for the reconstructed bladder equivalents were similar to those of native tissues.

Conclusions: Urinary tract specific stromal cells can give rise to extracellular matrices with better physiological and mechanical characteristics than non-specific stromal cells. Our urinary equivalent is suitable as urethral graft either for onlay or tubular urethral replacement or as bladder model for disease modeling and pharmacotherapeutic testing.

MP-05.02
Laparoscopic IVC injury management training: Predicting technical & non-technical skills

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Introduction: Major vascular injuries during laparoscopic surgery, though rare, can lead to significant morbidity. Simulation-based team training (SBTT) provides an opportunity to experience rare OR crisis scenarios in a safe environment. We developed a unique SBTT lap IVC injury scenario and conducted an observational study to determine predictors of surgeon performance.

Methods: Urology residents from our institution were recruited to participate in a SBTT lap nephrectomy exercise. Residents completed both a demographic & multidimensional personality questionnaire (Big Five Index – BFI) and were instructed to play the role of staff urologist. A vasovagal response to pneumoperitoneum and an IVC injury event were scripted into the scenario, unbeknownst to trainees. Resident performance in managing these events was video-recorded. All scenarios ended upon either successful repair of IVC injury, decision to convert to open repair, or max blood loss (2.5L). Technical & non-technical skills (NOTSS) were assessed by expert lap surgeons using validated tools. The Chi-square, Mann-Whitney U, ANOVA, and Pearson & Spearman correlations were utilized as indicated for statistical analysis.

Results: Fifteen urology residents participated (10 Jr & 5 Sr). Mean EBL was 1.98L and 5 residents were unable to complete the exercise safely. Sr residents had more lap nephrectomy experience ($p<0.01$) but were similar to Jr residents in prior SBTT experience and on baseline BFI personality scores. Sr residents outperformed Jrs on both technical (15.1 vs. 9.9, $p<0.01$) and NOTSS performance (13.8 vs. 10.1, $p=0.03$). Technical score correlated with NOTTS score ($p<0.01$) while pass/fail rating correlated with technical performance ($p<0.01$), NOTSS score ($p=0.02$), and EBL ($p<0.01$). Only the conscientiousness dimension of the BFI correlated with technical score ($p=0.03$) and pass/fail rating ($p=0.04$). Of the 4 NOTSS domains assessed, level of training correlated with situation awareness, decision-making & leadership scores but not with communication scores ($p=0.09$).

Conclusions: Resident level of training and lap experience correlated with technical & non-technical performance during a simulated laparoscopic IVC injury scenario. Level of training alone does not seem to predict communication & teamwork skills.

MP-05.03
Optimal timing of expert feedback in a simulated flexible ureteroscopy course

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Introduction and Objectives: A simulation-based training (SBT) curriculum for flexible ureteroscopy (fURS) was developed for junior urology residents. The benefits of expert feedback during SBT are well understood, but the optimal timing is not known. The objective of this study was to determine if early expert feedback was any better than late feedback, in order to determine the optimal implementation of a fURS training program.

Methods: The SBT curriculum was designed for PGY1-3 urology residents at the University of Toronto and Dalhousie University. This course included a didactic lecture focused on fundamental ureteroscopy principles and basic fURS techniques, a hands-on demonstration of fURS, and 3 independent practice sessions using the Cook® URS model. Participants were randomized into two groups: early feedback (EF) and late feedback (LF). The EF group received expert feedback regarding their performance of a standardized fURS task before independent practice sessions, while the LF group engaged in independent practice prior to receiving feedback. Baseline pre- and post-course assessments of fURS skills were conducted using the same standardized fURS task. All performances were videorecorded then graded by 2 blinded experts using a validated assessment device.

Results: 15 residents participated in the study. The groups had similar baseline fURS experience and pre-course fURS task performance. There was a significant difference in mean pre- and post-course task completion times

overall (15.2 min vs. 9.1 min, p<0.001); however, there was no difference in improvement between the 2 groups (p=0.884). Mean performance scores improved in both groups overall (18.2 vs. 24.2, p<0.001). The EF group had a statistically significant improvement in performance scores compared to the LF group (p=0.05). More residents achieved a "pass" rating in the EF group vs. the LF group (p=0.003). Most (73%) of residents reported they would prefer early feedback.
Conclusions: This study showed the SBT curriculum for fURS is effective for short-term learning of technical skills amongst junior level urology residents. Early feedback resulted in marginally better overall scores and was preferred by residents.

MP-05.04
First Canadian experience with robotic single incision pyeloplasty: A comparison with multi-incision technique
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We wanted to compare the outcomes of single incision robotic laparoscopic pyeloplasty vs. multi-incision pyeloplasty with the da Vinci robotic system. We reviewed all consecutive robotic pyeloplasties from Jan 2011-Nov 2014. A total of 27 procedurew were performed (13 single: 14 multi). Total duration of followup with 308 and 353 days in single and multiport groups (p = NS) and patient demographics were similar between groups. Mean operating time was similar (223 vs. 199 min (p =NS) as was hospital stay (75.9 hr vs. 93.2 hr (p - NS) between single and multi-port groups. Two patients in vthe multi-port arm had persistent obstruction vs. one in the single arm on nuclear renogram post-operatively, however only one patient in either arm required re-intervention. One complication occurred in each group and one addtional port was placed in 4 single port operations to faciliate the operation. We report the first Canadian experience of single port robotic pyeloplasty and the first North American experience with the Single Site device (Intuitive™). Overall, our single port procedure is associated with similar operative times, success rates, times of hospitalization adn complications compared with multi-port surgery. Verifying these results with a larger cohort is required prior to wide adoption of this technique.

MP-05.05
Missing the mark: Current practices in teaching the male urogenital examination to Canadian undergraduate medical students
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Introduction and Objectives: The urogenital physical examination is an important aspect of patient encounters in various clinical settings. Exposure to the urogenital examination is typically encountered by medical students during their preclinical undergraduate curriculum. Introductory clinical skills sessions are intended to be well supported to alleviate students' anxiety when learning this sensitive physical exam. The techniques and resources each Canadian medical school uses to guide their undergraduate students through the urogenital examination has not been previously reported.
Methods: This study surveyed clinical skills program coordinators at all English-speaking Canadian medical schools regarding their urogenital examination curriculum with an online questionnaire.
Results: A response rate of 100% was achieved providing information on resources available to students, the faculty involved in clinical skills sessions as well as the manner in which students were evaluated in their undergraduate program. Surprisingly, over 1/3 of the English-speaking Canadian medical schools do not provide a structured setting where a urogenital examination is performed on a patient and not one formally readdresses the urogenital physical examination after the preclinical curriculum. Perhaps even more disconcerting, no formal evaluation is instituted at almost 50% of English-speaking Canadian medical schools.
Conclusions: To ensure medical students are confident and accurate in performing a urogenital examination, it is essential that they be provided the proper resources, teaching and training. It is crucial as we progress towards a competency based curriculum, that increased focus be placed on patient encounters in early and late clinical training years. Without this commitment by medical schools, we are doing a disservice not only to the medical students but to our patient population as well.

MP-05.06
Mapping a competency-based urology curriculum: Agreement (and discrepancies) in the Canadian national opinion
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Introduction and Objectives: Urology residency training in Canada is evolving from a time-based model to a competency-based curriculum. To develop this curriculum we need to define core surgical competencies for newly minted urologists. We aim to better define core surgical urology competencies and assess discrepancies in opinion nationally.
Methods: A online survey based on the current RCPSC objectives of training in urology was designed and validated in July 2014. The survey consisted of questions on practice demographics, resident involvement, fellowship training, and 76 common urologic procedures. Between August-October 2014 all 536 practicing members of the CUA were asked to rate each procedure using a 5-point Likert scale based on the statement, "After completion of residency training in Canada a urologist should be proficient in". A core procedure was defined as one for which there was ≥75% agreement. Descriptive statistics and non-parametric testing were used to summarize the findings.
Results: A total of 128 urologists completed the survey (25.8% response rate) with representation across Canada. Respondents included 40.6% community and 59.4% academic urologists. The survey identified 8 procedures with 100% agreement and a total of 30 "core" procedures with ≥75% agreement. When comparing community and academic urologists there was significant disagreement on 27 procedures including 11 "core" procedures most notably radical cystectomy (88.5% agreement vs. 67.1%; p=0.002), open pyeloplasty (84.6% vs. 65.8%; p=0.04), simple prostatectomy (78.9% vs. 69.7%; p=0.027), perineal urethrostomy (80.8% vs. 67.1%; p=0.016), open radical prostatectomy (96.1% vs. 80.3%; p=0.007), and Boari flap (90.4% vs. 76.3%; p=0.004). In general community-based urologists tended to rate procedures as core more often than their academic counterparts. Regional, population, and fellowship related "core" discrepancies were also found for female urethral slings, TRUS biopsy, laparoscopic pyeloplasty, ESWL, radical urethrectomy, adrenalectomy, penile plication, PNL, testes biopsy, and endopyelotomy.
Conclusion: This national survey has provided consensus on 30 procedures that should comprise a core surgical curriculum in urology, however, there are some key differences of opinion that must be considered.

MP-05.07
The importance of graphic literacy in patient-centered communication
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Objective: The use of graphics within clinical practice is an emerging approach to facilitate efficient patient-centered communication. We sought to examine literacy level and comprehension of graphs designed to promote patient-provider communication following prostate cancer (PCa) treatment.
Methods: We assessed literacy using validated tools including: Rapid Estimate of Adult Literacy in Medicine (REALM), Subjective Numeracy Scale (SNS) and Graphic Literacy Scale (GLS). We assessed literacy in 62 PCa patients and 50 PCa providers, consisting of 25 physicians and 25 non-physicians. Following a literacy assessment, we assessed comprehension of QOL graphic displays in table, bar, and line formats. We report the literacy characteristics of patients and providers, differences in

their comprehension of QOL graphs, and relationships between patient literacy and QOL graph comprehension. Comparative statistics assessed for differences within and between groups. Statistical significance was designated as $p<0.05$.

Results: The mean age was 69, with 89% Caucasian, 79% married/partnered, and 74% completing college. College education was associated with significantly higher literacy scores (Mean REALM 99% vs. 91%, p=0.03; mean SNS 78% vs. 67%, p=0.005; mean GLS 83% vs. 73%, p=0.04) and with significantly higher comprehension among all graph formats (table: 93% vs. 72%, p=0.004; bar: 94% vs 70%, p=0.002; line: 91% vs. 77%, p=0.02). Compared with patients, providers trended toward higher graphic literacy (80% vs. 87%, p=0.07) and comprehension, but this varied by graph format (table: 89% vs. 99%, p=0.07; bar: 88% vs. 98%, p=0.05; line: 88% vs. 98%, p=0.009). There was no difference in numeracy scores between patients and providers (p=0.23). Patients' graph comprehension was positively associated with their health literacy (r=0.16-0.46), numeracy (r=0.25-0.28), and graphic literacy (r=0.26-0.39).

Conclusions: Education level is significantly associated with graphic literacy and comprehension, yet comprehension varies among graph formats. These findings emphasize the importance of matching the literacy requirements of emerging graphic displays with the capabilities of patients and providers ensuring that all stakeholders can engage effectively in patient-centered.

MP-05.08

Mitochondria targeting hydrogen sulphide protects renal epithelial cells from hypoxia re-oxygenation injury

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Introduction: Kidneys procured from donors after circulatory death (DCD) often results in delayed graft function (DGF) in over 30% of recipients. DGF has been shown to increase morbidity and worsen short and long term graft survivals. Hydrogen sulphide (H2S), has been shown to have many physiological effects including a significant protective effect on renal transplantation induced IRI, at least in animal models. Although several H2S donor molecules are in existence, many have significant systemic effects, thus potentially precluding them from clinic use. Given the importance of mitochondria in the control of cell death, our objective was to determine if a newly derived mitochondrial targeting H2S donor molecule (AP39) would be more efficacious in protecting porcine kidney tubular epithelial cells (LCC-PK1) against IRI compared to the commonly used H2S donor (GYY 4137). We hypothesized that AP39 would be more efficacious than GYY4137.

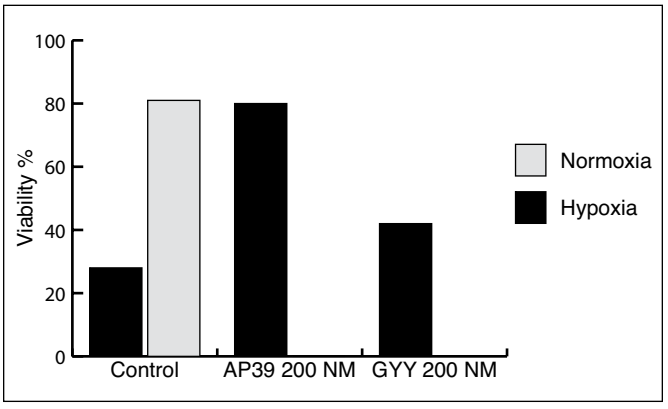

Fig. 1. MP-05.08. Cell Viability After Hypoxia re-Oxygenation Compared to Normoxia

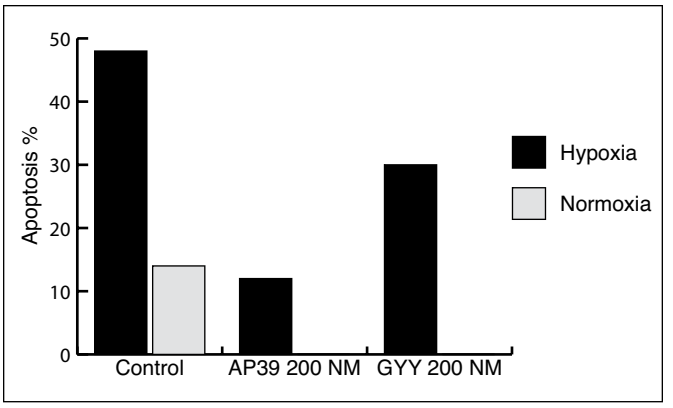

Fig. 2. MP-05.08. Cell Apoptosis After Hypoxia re-Oxygenation Compared to Normoxia

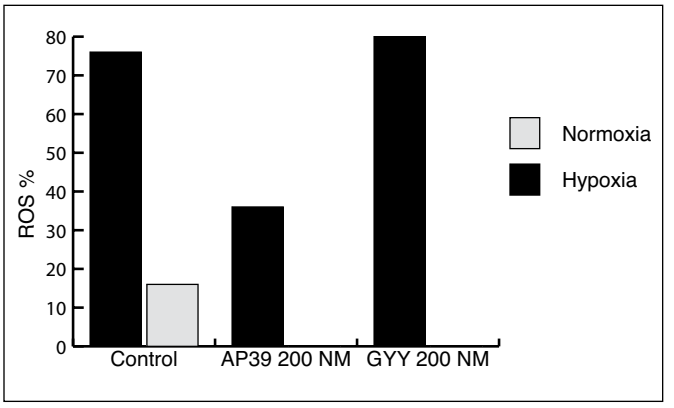

Fig. 3. MP-05.08. ROS After Hypoxia re-Oxygenation Compared to Normoxia

Methods: LCC-PK1 were exposed to warm ischemic stress (Glucose and nutrient deficient media, 37°C, in a hypoxia chamber at 1% O2 saturation) for 24 hours, without any treatment (control), with AP39 or GYY4137, followed by 24hr of re-oxygenation (21% O2 in a glucose and nutrient rich media at 37°C). Cells were subsequently assessed for cell viability, apoptosis, necrosis, reactive oxygen species (ROS) production and for the expression of mitochondrial derived pro-apoptotic and anti-apoptotic genes.

Results: After warm hypoxia re-oxygenation, both AP39 and GYY4137 showed better cell viability when compared to control (Fig. 1). However, AP39 was significantly superior ($P<0.002$). AP39 limited cell death after hypoxia to levels similar to normoxic samples with a significant reduction in cell apoptosis (Fig. 2). A two-fold greater decline in ROS in favor for 200nM AP39. AP39 increased the anti-apoptotic protein Bcl-2 and reduced the pro-apoptotic protein BID but did not reduce Bax (Fig. 3).

Conclusion: This is the first in vitro study testing the effects of mitochondrial targeting H2S donor molecules on renal epithelial cells in warm IRI. AP39 appears to have a more potent protective effect against hypoxia compared to GYY4137, and this benefit appears to be attributable to reduction in apoptosis. Further studies using animal models are needed to validate these novel findings.

MP-05.09

Prospective assessment of robotic single incision donor nephrectomy vs. laparoscopic multi-port donor nephrectomy

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Introduction: Our study aims to compare robotic single port and standard laparoscopic donor nephrectomy in terms of safety/efficacy and patient satisfaction in regards to pain and body image.

Methods: Twenty patients were enrolled in a prospective assessment of robotic single incision laparoscopic donor nephrectomy (n=8) with standard multiple incision laparoscopic donor nephrectomy (n=12) utilizing a standard 3 port plus pfannestiel extraction technique.

Results: Demographics were similar between the robotic and standard laparoscopic donor groups in regards to age and body mass index. Operative time was comparable between the two groups at 247 min for the robotic and 233 min for the laparoscopic technique. There was no difference in renal warm ischemic time and length of hospital stay. Post-operative pain scores on post-operative days 1 and 7 were 4.4 and 1.8/10.0 in the robotic group versus 5.5 and 2.5/10.0 in the standard laparoscopic groups. Body image scores on day 3 and after 1month post-operatively were in favor for the robotic group as (23/28 and 23/28) vs. laparoscopic group (20/28 and 20/ 28). Only one patient in the laparoscopic group developed wound hematoma postoperatively with no other significant complications in either group.

Conclusion: Single incision robotic donor nephrectomy is safe and comparable to standard laparoscopic donor nephrectomy with regards to donor outcomes. Ongoing study with larger sampler size will determine whether robotic single site donor nephrectomy is associated with reduced postoperative pain scores and better body image score vs. standard technique.

MP-05.10

Assessment of percutaneous renal access skills during urology objective structured clinical examinations

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Objectives: The first objective was to assess percutaneous renal access (PCA) skills of urology Post-Graduate Trainees (PGTs) during Objective Structured Clinical Examination (OSCEs). The second objective was to determine whether previous experience with Percutaneous Nephrolithotomy (PCNL) improved performance.

Methods: After obtaining ethics approval, PGTs from two urology programs in Quebec between Post-Graduate Years (PGY-3 to PGY-5) were recruited. Each trainee was asked to answer a short questionnaire regarding previous experience in endourologic procedures. After a 3-minute orientation on the PERC Mentor™ simulator, each trainee was asked to perform task 4, where they had to correctly access all of the renal calyces and pop the balloons in a normal left kidney model. Data from the questionnaire and the performance report generated by the simulator were collected and analyzed.

Results: Thirteen PGTs participated in this study. PGTs had performed a median of 200 (50-1000) cystoscopies, 50 (10-125) TURBTs, 30 (0-100) TURPs, 5 (0-50) laser prostatectomies, and 50 (2-125) ureteroscopies prior to this OSCE. PGTs with previous PCNL experience (8/13) had performed a mean of 18.6±6.3 PCNLs. When compared with PGTs without previous PCNL experience, PGTs with previous PCNL experience performed significantly better in terms of shorter fluoroscopy time (FT) (10±1.5 vs. 5.1±0.7 min; p=0.04), fewer attempts required for successful puncture of the pelvi-calyceal system (PCS) (21±2.3 vs. 13±1.8; p=0.02), and had significantly lower complications in terms of fewer infundibular injury (7.4±1.5 vs. 2±0.4; p=0.004) and fewer PCS perforations (11±1.7 vs. 4.5±1.2; p=0.01).

Conclusion: It is feasible to use the PERC Mentor™ simulator during OSCEs to assess PCA skills of urology PGTs. PGTs who had previous PCNL experience performed significantly better with fewer complications.

MP-05.11

Analysis of motion in laparoscopy: The deconstruction of an intracorporeal suturing task

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Introduction and Objectives: Simulation plays an important role in surgical education. This study describes a laparoscopic box trainer with motion sensor capabilities used to study a deconstructed intra-corporeal suturing task.

Methods: A traditional box trainer was fitted with a custom-built motion tracking system. Participants were stratified into novice, intermediate and expert groups. They performed a defined intra-corporeal suturing task. Real-time motion data was collected in four degrees of freedom (DOFs) (roll, surge, pitch, yaw). The task was then deconstructed into segments: 1) loading needle, piercing penrose, and suture pull-through; 2) double throw knot; 3) first single throw knot; and 4) second single throw knot. Two motion analysis parameters (MAPs) were studied for each DOF: 1) number of extreme velocity events and 2) number of extreme acceleration events. One-way ANOVA analysis was used to compare MAPs between expertise groups. Post-hoc analysis was performed using two sample t-tests.

Results: Sixty-four participants were tested (14 novices, 19 intermediates and 31 experts). The largest difference in MAPs between novices/intermediates vs. experts was seen in the 'double throw knot' task. Analysis of MAPs in the first deconstructed segment (orienting and passing needle and suture) revealed differences between novices and experts in ROLL and PITCH DOFs only. For the 'first single throw knot' similar MAP trends were noted across all DOFs, with significant differences between novices vs. experts and intermediates vs. experts, but not intermediates vs. novices. For the 'second single throw knot', a difference in MAPs across all four DOFs was preserved only for novices vs. experts.

Conclusions: Analysis of motion for deconstructed segments of a defined suturing task in a laparoscopic simulator allowed identification of the most challenging components. Such information may allow educators to better assess and teach the psychomotor skills necessary to carry out a given task.

MP-05.12

Social media expansion at American Urological Association meetings

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Objectives: Numerous studies have reported on the expanding use of social media at urology conferences. The goal of our study was to directly compare twitter activity between the 2012, 2013 and 2014 American Urological Association (AUA) annual meetings.

Methods: The AUA endorses meeting-specific "hashtags", text strings included in tweets that allow collation into a thread of related messages, each year. We used the unique hashtags for the past three AUA meetings (#uro12, #aua13, and #aua14) to examine trends over time in twitter activity during each meeting, including the overall volume of tweets as well as the number and type of contributors. Qualitative classification using an established framework allowed characterization of tweet type and quality.

Results: The volume of tweets during AUA meetings has steadily increased from 753 in 2012 to 9637 in 2014, as has the number of participants (from 130 to 1122). Interactive conversation and message amplification have also increased, with a greater number of individual users replying to or sharing posts made by others. Urologists have become the most important contributors to the conversation with an increasing number of tweets per urologist, and a higher likelihood that these messages are shared by others (proportion of tweets retweeted 24.6% vs. 8.5% for

others; p<0.001). Further, the top overall contributor has switched from a biotechnology analyst to a urology organization.
Conclusions: Social media use continues to increase at the AUA annual meeting. Urologists now comprise the most important group contributing to conference messaging. Social media has clearly come to represent an important new avenue for meeting-related discussion and dissemination.

UP-05.01
International Urology Journal Club on Twitter: A growing educational forum

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Introduction and Objectives: In 2012, we pioneered the first ever international Twitter-based journal club (#urojc) to discuss urology articles on a monthly basis with diverse global participation. Since that time, this model of an international Twitter based journal club has been adopted by several other medical specialties including general surgery, respiratory medicine and nephrology. The objective of this study is to examine the development of the urology journal club into an innovative and thriving forum for exchange of ideas, information and opinions since its conception two years ago.
Methods: Monthly twitter analyses such as number of users, tweets and potential tweet views (impressions) for the journal club were obtained via a third-party service using the pre-defined Twitter hashtag #urojc. Qualitative analysis was also performed of each individual tweet to assess for relevance to the discussion. Comparisons were made between data from the first and second year of operation of the journal club, including the number and geographic location of participants, as well as the quantity and quality of tweets.
Results: See Table 1 for summary statistics. The total number of unique users of #urojc almost doubled from year one to year two. The mean number of total participants increased by seven per month, and mean number of total countries represented increased by three per month. While the number of tweets per month also increased from year one to year two, the proportion of content-relevant tweets remained stably high at approximately 60%. Meanwhile, there was a greater degree of participation from authors of the study being discussed over time.

Table 1. UP-05.01. Summary statistice comparing first and second year*

	Year one	Year two	Total
Unique users	189	184	373
Mean # participants	29	46	44
Meaan # countries (continents) represented	7 (3)	10 (4)	9 (4)
Mean # new participants	14	15	15
Mean # tweets	195	209	202
Mean # impressions	130 832	242 557	184 265
Author participation (%)	7/12 (58%)	9/12 (75%)	16/24 (67%)
Original tweets related to topic	62	58	60
Original tweets related to #urojc	10	5	8
Non-relevant tweets (%)	6	7	6
Retweets (%)	22	30	26

*all figures are per month

Conclusions: It is clear that the International Urology Journal Club continues to draw robust participation from a global audience, and serves as a benchmark for Twitter-based journal clubs in other specialties. The majority of tweets are relevant to the content of the article, providing a novel forum to discuss new research findings with a global audience.

UP-05.02
Milestones in Canadian urology

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Introduction: Canadian urology has rich and telling history. There are several publications on this topic, however most relates to a particular time frame or geographic location. The goal of this abstract is to present complete timeline of the history of Canadian Urology with emphasis on important issues and events.
Methods: We review all available archives documents from 1929 until 2015. The data were extracted from accessible publications, meeting minutes, letters and other documents. The following items were recorded: meeting place, presidents, officers & executives, chair of the committees, society publications, awards and other important events and data. The data are presented in the form of visual timeline with particularly significant events and documents highlighted in the graphics.
Results: The first meeting of the Section of Urology within Canadian Medical Association was in 1929. Canadian Urological Association (CUA) was funded in December of 1945. Since then we had 69 Annual Meetings of CUA with the 70th to be held in Ottawa in June 2015. The meetings initially had no particular schedule but later started to alternate between east, west and central Canada. There were 70 presidents and the number of executives and officers increased with the proliferation in the activities of the association. The membership increased to over 1100. CUA incorporated in 1998. CUA awarded honorary membership to 16 individuals. CUA life achievement award established in 1980 was presented to 26 CUA members. Canadian Urological Association Scholarship Foundation (CUASF) was incorporated in 1997 and provided thousands of dollars of scholarships for numerous early career urologists in Canada. CUA endorsed Canadian Journal of Urology as an official journal of the association in 1994. In 2007 CUA create its own journal Canadian Urological Association Journal. CUA produced almost 60 Patients Information Pamphlets serving both patients and members. In the recent years CUA established cooperation with other international urological societies.
Conclusions: The CUA grows up steadily from 1945 and matured to a very effective and organized society serving and representing Canadian Urologist and becoming the "The Voice of Urology in Canada".

UP-05.03
A resident run clinic in a urology training program: Concept and patient's perspectives

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Introduction and Objectives: The quality of patient care provided by surgical residents is important, as is the quality of the education received by the resident. Herein we report on the concept of a resident run Urology clinic as well as on the patient's perspectives and satisfaction.
Methods: In Saint John, New Brunswick, a Urology resident run clinic exists at which a patient is first evaluated by a resident physician (with the patients knowledge) and any follow-up visits or procedures are coordinated with the resident present so as to ensure continuity of care. At the end of this longitudinal experience, patients are administered a questionnaire to determine their level of satisfaction with the care they received by the resident physician. The questionnaire is a 10-point Likert scale including questions on 4 areas of care; physician's attitude, professionalism, explanation received, and adequacy of the amount of time spent with the physician.
Results: 61 patients were identified who were cared for in the resident run clinic between 2010-2014. Patient satisfaction was high in all categories with mean scores of 9.6, 9.7, 9.3, and 9.1 in the areas of physician's atti-

tude, professionalism, explanation received, and adequacy of the amount of time spent with the physician, respectively. Several patients provided written comments on the questionnaires, with most expressing satisfaction with the care they received.
Conclusions: Patients describe a high level of satisfaction with the care they receive in a resident run Urology clinic. This clinic incorporates most of the CanMEDS objectives and provides a longitudinal learning experience which is generally absent from surgical residencies, As we search for novel ways to provide education to future Urologists, this type of clinic may serve to teach physician independence while still providing excellent patient care.

UP-05.04
OAB patients know little about their condition
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Introduction: As overactive bladder (OAB) is an age-related condition, its incidence is expected to rise as the elderly population in Canada grows, far outpacing the availability of urologists in the country. Identifying opportunities for intervening prior to initial consult may help reduce the expected clinical burden OAB represents. The purpose of this study is to test whether patients with relatively more severe OAB symptoms are more knowledgeable about their condition than those with relatively milder symptoms.
Methods: An evidence-based questionnaire, designed to test patients' understanding of OAB, was developed for use in a multidisciplinary secondary care urology clinic. The instrument is comprised of 20 questions relating to three underlying factors: 1) risk and symptoms, 2) treatment options, and 3) potential side effects of these treatment options. The questionnaire was based on similar instruments designed, used, and published in oncology. Data in this study was collected from patients enrolling in a registry whose first visit to the clinic was between June and December 2014.
Results: Of 94 patients included in the registry, 82 (87%) completed the knowledge questionnaire. These patients had an average symptom score on the OAB-V8 of 18.9 and 11.1 on the IPSS. The mean knowledge score was 8.3 (out of 20). There were no statistically significant differences in knowledge of OAB and patients' self-reported symptom severity.
Conclusions: In general, this study's sample had little knowledge of OAB. Common questions about behavioral modifications (e.g., consumption of caffeinated beverages) were answered incorrectly. Knowledge scores were unrelated to self-reported OAB symptoms, suggesting that even patients with severe impairments had little understanding of their condition. These results could represent an opportunity to design an educational intervention aimed at patients with OAB who are referred to a urologist and awaiting their initial assessment.

UP-05.05
The value of a core clinical rotation in urology for medical students
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Introduction and Objectives: Since September 2013, third year medical students at the University of Manitoba are required to complete a one-week urology rotation during their core surgical block. Our study aimed to assess the utility and value of this change in the core curriculum.
Methods: Students were asked to fill out an online survey prior to and at completion of their one-week mandatory urology rotation. This survey was voluntary and confidential. Paired t-test and fishers exact test were used for data analysis.
Results: Sixty-three students completed the pre-rotation survey and 53 students completed the post rotation survey. After completing their rotation, students gained a better understanding of various uropathology ($p < 0.0001$) and appreciated that urology compromises a significant component of a general medical practice ($p = 0.0230$). In terms of practical skills, following a urology rotation students gained a better understanding on how to insert a foley catheter (p=0.0059), had attempted foley catheter insertion (p=0.0028) and felt comfortable independently inserting a foley catheter (p=0.0001). Additionally, students were more likely to feel comfortable performing a digital rectal examination for prostate cancer screening (p=0.0085), as well as investigating hematuria (p=0.0001) and renal colic (p=0.0001). Importantly, students gained a greater understanding on when to properly utilize the consult services of urology (p=0.0001). At the end of the rotation, 87% and 89% of students felt the rotation to be beneficial and were glad the rotation was mandatory, respectively. However, there was no difference in the rate of students who would consider urology as a future career (22.7% vs. 38%, p=0.7424) before and after the rotation, respectively.
Conclusion: The introduction of a mandatory urology rotation for undergraduate medical students improved the fundamental urological knowledge and skill set of rotating students.

UP-05.06
Risk factors associated with the presence of microscopic hematuria in men
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Introduction and Objectives: Microscopic hematuria is a common incidental finding on routine dipstick urinalysis. Long-term follow-up has shown that up to 5% may develop urinary tract malignancy. Although there are no clear recommendations to perform routine urinalysis, some studies have shown that up to 50% of general practitioners continue to perform annual routine urinalysis regardless of age or risk factors. The aim of our study was to identify the prevalence of microscopic hematuria as well as risk factors in the general population presenting to an annual Men's Health Clinic held by volunteers in a public venue.
Methods: We conducted a retrospective analysis of prospectively collected data at an annual Men's Health clinic from 2008 to 2013. Patient reported health questionnaires, basic physical exam including digital rectal exam, basic bloodwork and urine dipstick data was examined. Data was analyzed using SPSS chi-square, Fisher exact, Student T-test and regression analysis as appropriate.
Results: 875 patient visits were examined. Of these, 775 had urinalysis done. Patients who had declared a previous history of hematuria were excluded from analysis. 721 patients were therefore included in the final analysis. 64 (8.9%) patients had positive hematuria on dipstick. Average age in both groups was 55 years. Diabetes was positively correlated to microscopic hematuria with odds-ratio of 2.27 (1.1-4.6). There was no significant correlation identified with age, body-mass index, smoking, prostate specific antigen (PSA) or International Prostate Symptom Score (IPSS).
Conclusions: Microscopic hematuria on dipstick urinalysis is a prevalent condition in the general male population. The only risk factor associated to microscopic hematuria identified in this study was diabetes. Traditional risk factors for hematuria and malignancy such as smoking, age and lower urinary tract symptoms showed no association.

UP-05.07
Patient-driven use of smartphone camera in an office urology practice
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Introduction: With advances in digital and information technology, smart phones are fast overtaking the LCD cell and the wired ones. These hand-held devices are equipped to capture images at high resolution and transmit them accurately and instantly by multimedia messaging service (MMS). This is influencing the way we live, work and play - and thus our health care.
Materials and Methods: Between January 5 and December 22, 2014, we observed the frequency of occurrence when patients used their smart

phone camera images to supplement their clinical history and progress. We excluded instances when digital photos were taken at the time of surgical procedure or follow - up with appropriate informed consent.
Results: There were 4 cases: i. 60 year old man with penile lesion provided pre-op and several post-op photos; ii. 56 year old man with post papaverine priapism and penile bruising - photos for self monitoring and communication with the urologist; iii. 45 year old man with a history of penile chordee in the absence of a palpable Peyronie's plaque; and iv. 60 year old man had a smart phone uptake of his CT scan report for his records and to share with Family doctor.
Comments: Use of smart phone camera has been reported in different clinical scenarios. Patient-driven initiatives can be complimentary to appropriate physician assessment. Use of this device by urology patients are occurring but not frequently reported. Its usefulness in aiding diagnosis, treatment, counseling and surveillance needs further study especially regarding protecting patients' privacy rights and confidentiality.

UP-05.08

Satellite rural ambulatory urology clinics in northeastern Ontario: 25 years later

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Introduction and Objectives: Along Highway 11, north of North Bay are several rural communities that are served by small hospitals located 40 to 340 kilometers away from Timmins. Until 1989, most urological services were provided at the Timmins and District Hospital. It is not uncommon to have an elderly gentleman with urosepsis and acute urinary retention transferred by air ambulance from one of these communities. In 1990, satellite urology clinics were established to improve access and quality of care and hopefully save health care costs. This is an observational study to understand what was done and where we are today.
Methods: Geographic and demographic data were gathered with a focus on Timiskaming and Cochrane Districts. Needs assessment was completed through interviews with key stakeholders. Approval for the project was given by the Underserviced Area Program (UAP) of the Ministry of Health. Hospital privileges were approved. Primary health care providers andthe communities were notified of start dates. The various hospitals provided clerical and support staff. Evaluation processes were established to provide feedback from all stakeholders for program enhancement.
Results: There are now 7 clinics. The scope of services offered has been consolidated and expanded with introduction of low-risk, low-resource out-patient procedures. Delegated urological procedures, community engagement and patient education initiatives have grown. Inter-professional development and collaboration have been beneficial resulting into some clinical research. With the new medical school, these rural hospitals have become hubs for clinical training.
Conclusions: Satellite urology clinics appear to be beneficial to the patients, the health care professionals and the rural communities. It improves timely access, quality of care and may be cost-saving. The urologist in the community can be a catalyst for inter-professional development and team building. Opportunities for research and learners abound.

UP-05.09

Building capacity in Rwandan Urology: An avenue of collaboration for the Canadian Urologists

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Introduction and Objectives: In 2013, a call for volunteers was made through the Pediatric Urologists of Canada (PUC) to visit Rwanda, a country with 11 million people served by 3 urologists. The volunteers were expected to work collaboratively with the local Faculty and Learners. By October 2014, two teams of 4 Urologists and two Residents have participated. We report the outcome.
Methods: For 2 weeks in Kigali, participants functioned as collaborative educators and faculty. We worked at the three teaching hospitals - the CHUCK, King Fazal and the Military. The program included: 1.Outpatient Screening Clinic-adult and pediatric; 2. Operative (OR) surgeries including pediatric anomalies, oncology, voiding dysfunction and adult urology - BPH, urethral stricture, bladder and prostate cancer; 3. "One-to-one" Case-based Learning; 4. Workshop in Office Urodynamics, 5. Academic day of didactic lectures on pediatric and adult urology; and 6. Community Engagement. The host provided accomodation, meals and local transportation. Participants were responsible for their air fares and travel arrangements.
Results: Health care services, as elsewhere, are unique with the existence of public and private hospitals and other arrangements in between. With only 3 urologists, the wait times were unusually long. Despite the limitations, no one was denied care because of lack of funds. Anesthesia Nurse practitioners were a unique complement in the OR workforce. Invitation from Kigali was based on local needs rather than Western models and expectation. Local accountability and initiative were noticeable. We acted as mentors, moderators and educators following a curriculum developed in Rwanda. Residents got to learn, educate and work in a welcoming and different environment.
Conclusions: With the short exposure to a small segment of the Rwandan healthcare model, we feel that there is room for improvement and development in urology and retention of well- trained home-bred workforce. The SIU, CUA, academic institutions and urologists in Canada have a great opportunity of making significant contribution to Rwanda and other LIMCs through supporting avenues of collaboration such as this.

UP-05.10

New three dimensional fully autologous tissue-engineered vaginal model using the self-assembly technique

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Introduction and Objectives: Many diseases necessitate the substitution of vaginal tissues including congenital anomalies, malignancy and traumatic lesions. Current replacement therapies are associated with many complications. Recent tissue-engineered vaginas using xenografts were implanted in patients with congenital vaginal abnormality. However, the use of non-autologous tissues for vaginal bioengineering may be associated with infection, immunologic reactions and fibrosis on long-term. The use of autologous cells and tissues avoids these disadvantages. In this study, we aimed to create neo-vaginas with the self-assembly technique using autologous epithelial cells and stromal cells without the use of exogenous materials.
Methods: Epithelial and stromal cells were isolated from vaginal, labial and skin biopsies using enzymatic methods. Stromal cells from the 3 different tissues were stimulated separately to form collagen sheets with culture medium containing ascorbic acid. Three collagen sheets were stacked together to form vaginal equivalents (VEq). Vaginal epithelial cells were seeded on top of the VEq made from dermal and vaginal stromal cells, while labial epithelial cells were seeded on top of the VEq made from labila stromal cells. The equivalents were evaluated using histological, functional and mechanical assessments.
Results: Stromal cells formed collagen sheets that could be handled easily. Vaginal epithelial cells formed a well differentiated stratified epithelial layer. Epithelial differentiation was marked with positive staining for pancytokeratins, Involucrin and Keratin 13. Tissue impermeability was suggested with the use of E-cadherin and ZO-1 antibodies. Vaginal stromal tissue was shown to include collagen I, III and IV, and fibronectin.

Continuous basement membrane underlying epithelial cells was evident by Laminin V and collagen IV. The epithelium, basement membrane and stroma characteristics were comparable to native vaginal tissues.
Conclusions: Using the self-assembly, in vitro vaginal tissues were created with many functional and biological similarities with native vaginal tissue without any foreign material. It is appropriate for vaginal substitution. Additionally, this model can be used for infectious studies, vaginal applicants and drug testing.

UP-05.11

Robotic surgery in Kuwait: The first experience

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Introduction and Objectives: Advances in urology have focused on minimizing the invasiveness of surgical procedures without compromising outcomes such that a significant paradigm shift has occurred in urological procedures ultimately leading to introduction of robotic surgery. We hereby present our initial experience and outcomes in Kuwait with the da Vinci Si robot.
Methods: After IRB approval data was recorded for all patients who underwent robotic surgery using the da Vinci Si at Sabah Alahmad Urology Center in Kuwait. Parameters recorded included demographic data, diagnosis, basic laboratory and imaging results, total operative time including docking and console time, estimated blood loss, need for transfusion, and duration of hospitalization. Complications were graded using the Clavien classification system. Major complications were defined as ≥ Clavien 3.
Results: A total of 23 cases were done robotically in Kuwait From February 2014 to January 2015. The first case was right robotic partial nephrectomy. Cases included 7 radical prostatectomies for prostate cancer, 6 radical nephrectomies and 3 partial nephrectomies for renal tumors, 3 pyeloplasties for ureteropelvic junction obstruction, 2 radical adrenalectomies for adrenal tumors, and 2 pyelolithotomies that failed ureteroscopic management.
All cases were done transperitoneally. There was no conversion to open and none of the patients recieved a blood transfusion. There was no major complications. There was 3 Clavien grade II complications recorded in 2 patients (8.7%). Two patients developed postoperative pneumonia treated with intravenous antibiotics. Both patients were post partial nephrectomy and both were heavy smokers. One patient had wound infection managed as an outpatient with incision and drainage and normal saline packing. There was considerably less docking and total operative time going from first to last case. Madian hospital stay was 3 days.
Conclusion: In the presence of a certified uro-oncologist with robotic training, our results show good patient and operative outcomes in a diverse group of robotic procedures. Establishing a robotic unit requires proper planning and selection of patients and continuous supervision and training of all members of the unit to ensure quality of care.

UP-05.12

Impact of a novel on-screen overlay frame of reference system for orientation during intraoperative laparoscopic surgery

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Introduction and Objectives: During laparoscopy, the surgical field is projected onto the endoscopic screen in the operating room (OR) and is used as the focal point during the procedure, requiring various types of communication to direct the learner. Directional terminology can get confusing when the spatial orientation of the on-screen target differs from each individuals' vantage point. We explored how teaching occurs in the laparoscopic setting both with and without a tool designed to improve OR teaching.
Methods: We have shown that using a combination of standardized verbal commands and transparent monitor overlays significantly improved teaching with laparoscopic simulators. We videotaped 19 laparoscopic teaching cases to serve as a baseline comparator group. We then introduced an alphanumeric grid screen overlay into the OR. We have since videotaped 22 laparoscopic teaching cases for analysis. Videotapes were transcribed verbatim and qualitatively analyzed. Follow-up interviews were conducted with participants.
Results: Analysis of the baseline cases revealed that teaching involved the instructor pointing to the screen, the patient, and the instrument(s); holding the instrument to guide learners' movements; and displaying the type of hand or arm movement required. Directional terms such as "right angle", "up", "down", "medial", etc. were frequently used. Learners were often told to visualize the movement before it was completed. The alphanumeric grid was utilized more frequently during the teaching of junior residents and those residents new to a given procedure, and all participants found it to be useful for practice. The preciseness of the grid format allows the learner to move directly the focal point, essentially eliminating the need for pointing and gesturing.
Conclusions: The alphanumeric grid overlay is a helpful tool for laparoscopic teaching, especially when used during the teaching of junior residents and those new to a procedure. We will continue to evaluate the alphanumeric grid in practice and evaluate additional overlays: a clock with x:y triangulation and one with a dartboard-type design. Results of these additional observations will be presented, along with photographs and videotapes of the system in use in the OR.

UP-05.13

Functional integrity of bladder detrusor strips in organ culture

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Aim: The pathophysiology of overactive bladder syndrome remains to be clarified. It is most likely a multifactorial condition with many contributing elements to the development of voiding dysfunction. Establishing a reproducible and consistent experimental in vitro method to study factors impacting bladder contractility could clarify our understanding of voiding dysfunction.
Methods: Detrusor strips were isolated from female rats of a hypertensive strain (SS2BN) and mounted on agarose culture dishes under minimal tension. These strips were maintained in DMEM/F12 culture media and were subjected to daily stimulation with KCl. The contractile responses of these strips were assessed by measuring their reactions to KCl and carbachol at days 0 (i.e. noncultured), 3, 5, and 6.
Results: The contractile response to KCl significantly decreased from day 0 (572.8±99.21 g/g tissue) to day 3 (225.5±79.13 g/g tissue), but then remained stable at days 5 (218.8±77.17 g/g tissue) and 6 (205.6±50.06 g/g tissue). The EC50 of the carbachol showed no statistically significant difference between days 0, 3, 5, and 6. On the other hand, there was a statistically significance between the Emax values, but only between day 0 (866.2±64.10 g/g tissue) and 6 (429.9±34.48 g/g tissue).
Conclusions: The organ culture method applied to rat detrusor strips is a valid, replicable and reliable tool to study their contractile properties in vitro. The response to KCl stimulation was higher with noncultured strips, but remained similar for days 3, 5, and 6. Moreover, carbachol stimulation remained constant up until day 5. Organ culture is therefore a reliable method to study the effects over several days of factors such as hormones and metabolites on bladder contractility.

UP-05.14

The succinate receptor GPR91 as a mediator of bladder relaxation

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Aim: Metabolic syndrome is strongly associated with overactive bladder syndrome (OAB) in both men and women, affecting a large population in Western societies. Metabolic syndrome and OAB are linked through common risk factors such as atherosclerosis, ischemia and a pro-inflammatory state. Increased succinate production is detected in the presence of hyperglycemia and hypoxemia, as with diabetes mellitus and metabolic syndrome, and was recently identified as a major metabolic switch controlling metabolic functions in the body through its receptor GPR91 (SUCNR1). Our goal is to determine the role of succinate and its receptor as a key mediator in bladder contract-relaxation.

Methods: Smooth muscle cells (SMC) and urothelial cells were isolated from rat bladder and grown in petri dishes until passage 2 and 5. After confluency, cells were exposed to oxygen 21% (normoxia) or 1% (hypoxia) for 24 hours then assessed for microscopy, immunohistochemistry and immunoblotting analysis. After confluency, cells were exposed to oxygen 21% (normoxia) or 1% (hypoxia) for 24 hours, and then treated for microscopy and immunoblotting analysis. Bladder strips were also used for in vitro assessment of contractile responses to carbachol and electrical field stimulation (EFS).

Results: GPR91 was detected by immunoblotting and light microscopy in SMC and urothelial cell cultures. Exposure of cultured cells to hypoxia (1% oxygen) for 24 hours dramatically decreased GPR91 in both cell types. Muscle strips incubated in organ baths with Krebs-Ringer buffer displayed a potent contraction in response to KCl (60 mM) or carbachol (3 nM to 100 µM).

Increasing concentrations of succinate gradually inhibited the tension elicited by a moderate concentration of carbachol (1 µM). Maleic acid, a less potent activator of GPR91, had similar effects than succinate. (On the other hand, malonate, an inhibitor of the conversion of succinate to fumarate, or dimethyl-succinate, a metabolizable permeable analog of succinate, citrate, oxalo-acetate and fumarate, intermediates of the Krebs Cycle, all mimicked the effect of succinate. Conversely, glucose, fructose glyceraldehyde, glycerol and pyruvate, intermediate of glycolysis, displayed no effects.)

Conclusion: The succinate receptor GPR91 is expressed in smooth muscle and urothelial cells of the bladder and is highly sensitive to hypoxia. This may caused by a downregulation from increased levels of succinate produced in hypoxia state. Succinate may control bladder relaxation stimulated by carbachol by binding its receptor GPR91 and by acting at the level of the Krebs cycle.

UP-05.15

Hypoxia-induced metabolic stress in bladder smooth muscle cells

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Objectives: Lower urinary tract symptoms are associated with the metabolic syndrome. The different components of MetS contribute to end-organ dysfunction such as the bladder, possibly through endothelial dysfunction or decreased blood flow. Hypoxia is known to develop in tissues of obese animal models and disrupt dramatically cell metabolism and functions. The aim of our study is to determine if hypoxia causes changes at a cellular level that may be responsible for voiding dysfunction.

Methods: Smooth muscle cells (SMC) were isolated from rat bladders using a collagenase IV method and grown in petri dishes until passage between 2 and 5. After confluency, cells were exposed to oxygen 21% (normoxia) or 1% (hypoxia) for 24 hours then assessed for microscopy, immunohistochemistry and immunoblotting analysis.

Results: SMC were characterized by immunohistochemistry for myosin and smooth muscle actin-alpha before and after hypoxia. MTT Cell proliferation Assay yielded similar results between normoxic and hypoxic cells. Hypoxia led to an increase in lactic acid release in the media of SMC. Cells showed an increase in GLUT-1 expression as revealed by immunohistochemistry and immunoblotting. Increase in HIF-1 alpha was also observed, demonstrating together with increases in GLUT-1 and lactic acid release that the SMC were in hypoxic state. The inducible nitric oxide-synthesizing enzyme iNOS was increased by hypoxia.

Regulators of cytoskeleton RhoA and ROCK-1 were not affected by hypoxia. On the other hand, the activated proteins Akt-473P and c-Jun amino-terminal kinases (JNKs) JNK-P, involved in insulin signaling and cell survival, were decreased with stable expression of non-phosphorylated Akt and JNK.

Conclusions: While short exposure to hypoxia does not affect SMC cytoskeleton integrity, SMC contractility may be impaired by the accumulation of NO from increased iNOS levels. Decreased levels of activated Akt and JNK suggests that hypoxia can contribute to the development of insulin resistance and increased vulnerability in SMC.