Syllabus

JK Wyatt Urology Residents Research Day

Friday, April 27, 2018
Museum London
London, Ontario

Schulich MEDICINE & DENTISTRY

Western

Remembering...

Dr. John (Jack) Kenneth Wyatt

Jack Wyatt completed his undergraduate and medical school training at Western. During his university days he excelled in sports and was captain of the Western football team. His medical school classmates described him as the class prankster.

After completion of residency training Dr. Wyatt began his urological career in 1960 at Victoria Hospital, practicing general urology with a special interest in cancer and reconstructive surgery. He later went on to serve as Residency Program Director and Division Chair, and aided the building of the Western Urology division into a strong clinical and academic program.

Dr. Wyatt is fondly remembered by alumni for his care in their well being as residents, and his sharp clinical acumen. He was also a great storyteller with a razor-sharp wit and dry sense of humor. He is remembered by former patients for his common sense approach, easy -going nature and empathy.

During his career Dr. Wyatt was actively involved in both the Northeastern Section of the American Urological Association and Canadian Urological Association. He served as CUA President in 1984.

Dr. Jack Wyatt passed away in 2004 after a long and distinguished urological career. We are indebted to his many contributions to Urology in London and beyond. His legacy is celebrated through our annual Research Day.

Western University
Jack Wyatt Urology Residents' Research Day
2018

RESIDENTS:

PGY5

Garson Chan
Melissa Huynh
David Mikhail

PGY4

Justin Kwong
Nahid Punjani
Wen Yan Xie

PGY3

Harmenjit Brar
Roderick Clark

PGY2

Jeffrey Law
Samir Sami
Heena Singh

PGY1

Ernest Chan
Heather Morris
Nahid Punjani

FELLOWS

Abdulaziz Al-Athel — EndoUrology
Jennifer Bjazevic — EndoUrology

Patrick McGarry — Prosthetics/
Reconstructive Urology

Shahid Aquil — Transplant
Rafid Al-Ogaili — Transplant

Malcolm Dewar—UroOncology
Khalil Hetou — UroOncology

GUEST PROFESSOR 2018

Dr. Bernie H. Bochner

Attending Surgeon, Urologic Surgery Service
Sir Murray Brennan Chair in Surgery
Memorial Sloan Kettering Cancer Center
Professor, Department of Urology
Weill Cornell Medical College
Memorial Sloan Kettering Cancer Center
Kimmel Center for Prostate and Urologic Cancers

Dr. Bernie Bochner is a world-renowned urologic surgeon who specializes in surgery for men and women with cancers of the genitourinary system. His main areas of expertise include radical surgical procedures for invasive bladder cancer and reconstructive surgery of the urinary system following radical cystectomy or pelvic exenteration. He is the PI of the famous randomized study published in the NEJM comparing open to robotic cystectomy. Radical cystectomy serves as the standard for definitive treatment of high-risk bladder tumors and can provide a cure in the majority of patients with early, invasive lesions. Function-sparing procedures (including preservation of the nerves responsible for erectile function and advanced reconstructive techniques that re-create the natural urination pathway after bladder removal) can also be performed to provide an excellent quality of life. Dr. Bochner is actively involved in clinical and translational reseach to determine which treatments are most likely to maximize a patient's chances of a cure. He is involved in ongoing studies to determine which features of a tumor predict for more or less aggressive behavior. This will help individualize treatment for each patient based on his or her tumor's characteristics. He is very interested in and actively studies ways to improve patients' quality of life after surgery. Dr. Bochner joined the Memorial Sloan Kettering faculty in 2000. He serves as the coordinator of the bladder cancer multidisciplinary working group and is co-director of the pelvic reconstruction/ surgery group at Memorial Sloan Kettering. He is actively involved in urologic oncology at the national level, serving as faculty for postgraduate courses in urologic oncology for the American Urological Association. He is involved in many professional societies including the American Urological Association, the Society of Urologic Oncology, and the Society of University Surgeons. Dr. Bochner is also on several editorial boards and serves as a reviewer for a variety of urology-related journals.

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Jack Wyatt Urology Residents' Research Day

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JK Wyatt Urology Residents' Research Day

Friday, April 27, 2018
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AGENDA

7:00 - 8:00	Registration and Continental Breakfast
8:00 - 8:15	Welcome and Introductions: Dr. H. Razvi and Dr. A. Sener
SESSION I	**Transplantation:** Moderator Dr. Alp Sener
8:15 - 8:30	J. Kwong: Pulsatile vs Centrifugal Preservation of Donor Kidneys: Analysis in a Pre-Clinical Renal Transplant Model
8:30 - 8:45	J. Law: Evaluation of Missed Opportunities for DCD Kidney Donors
8:45 - 9:00	D. Mikhail: Pediatric Recipients of Deceased Adult Donor Kidneys Have Equivalent Outcomes Compared with Pediatric Donors
9:00 - 9:30	**Western Faculty Presentation: Dr. P. Wang: The Evolution of Vesicoureteral Reflux**
9:30 - 10:00	Refreshment/Health Break
SESSION II	**Oncology**: Moderator Dr. Nicholas Power
10:00 - 10:15	M. Dewar: MRI-guided Transurethral Ultrasound Ablation for Localized Prostate Cancer: Prospective Phase I Clinical Trial with 36 Month Follow-Up
10:15 - 10:30	G. Chan: Contrast Enhanced Ultrasound in the Assessment of Malignant Phenotype in Solid Renal Masses
10:30 - 10:45	R. Clark: Inflatable Penile Prostheses Implantation: Does Antibiotic Exposure Matter?
10:45 - 11:00	K. Hetou: Mean of Maximum Standardized Update Value (SUV max) from PET Imaging: A Possible Predictive Parameter for Locally Advanced Prostate Cancer
11:00 - 12:00	**Guest Professor: Dr. B. Bochner: Robotic vs Open Radical Cystectomy for Muscle Invasive Bladder Cancer: Results of a Prospective RCT**
12:00 - 13:00	LUNCH

SESSION III **Functional Urology:** Moderator Dr. Patrick Luke

13:00 - 13:15 E. Chan: Revision Surgery for Penile Implants: A Retrospective Review

13:15 - 13:30 N. Punjani: The Impact of Common Urologic Procedures and Complications on the Risk of a Prosthetic Joint Infection

13:30 - 13:45 P. McGarry: To TURP or Not To TURP: How Do Urologists Use Nontraditional Urodynamic Results When Treating Male Lower Urinary Tract Symptoms?

13:45 - 14:30 **Guest Professor Dr. B. Bochner: Modern Molecular Characterization of Bladder Cancer**

14:30 - 15:00 **"Stump the Professors": Dr. Stephanie Tatzel**

15:00 - 15:30 Refreshment/Health Break

SESSION IV **Endourology:** Moderator Dr. Stephen Pautler

15:30 - 15:45 J. Bjazevic: The Times They Are a-Changin': Analysis of a Single Institution Experience in Percutaneous Nephrolithotomy Over 25 years

15:45 - 16:00 A. Al-Athel: The Ability of Bacteria to Enhance Calcium Oxalate Crystal Formation: An In-vitro study

16:00 - 16:15 S. Samir: Assessment of Firefly Technology in Robotic Partial Nephrectomy

SESSION V **Outcomes/Education:** Moderator Dr. Peter Wang

16:15 - 16:30 H. Brar: Impact of Comorbidity on Long-Term Outcomes in Patients Undergoing Radical Nephrectomy Compared to Partial Nephrectomy: A Population-Based Retrospective Cohort Study.

16:30 - 16:45 L. Stringer: Assessing Gender Trends in Acceptance to Urology Residency

16:45 -17:00 M. Huynh: Life and Death After the Death of Cancer: a Study of Population Health and Dynamics, and Healthcare Sustainability

17:00 – 17:15 H. Morris: Identifying Positive Character Traits in Surgical Resident Applicants: An Initial Prospective Cohort Study Evaluating the OCEAN-20 Questionnaire for Urology Resident Applicants

17:15 Wrap Up and Evaluations

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*Note: Guidelines = 15 minute presentations = 10 minute presentation, 5 minute Q & A
30 minute presentations = 20 minute presentation, 10 minute Q & A
45 minute presentations = 30 minute presentation, 15 minute Q & A

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada and approved by Continuing Professional Development, Schulich School of Medicine & Dentistry, Western University (7.75 hours). Each participant should claim only those hours of credit that he/she actually spent participating in the educational program.

This year's program is intended to provide participants with:

1. Incorporating evidence-based medicine into resident education and research
2. To update new paradigms in surgical training in the 21st century
3. To review current clinical practice guidelines in the management of bladder cancer and cystectomy
4. To review state-of-the-art care in the management of vesicoureteral reflux
5. To review the results of clinical and basic science research projects of the training staff from Western University in the following subspecialty areas:
   a. Oncology
   b. Endourology
   c. Transplantation
   e. Pediatrics
   d. Andrology
   e. Urinary voiding dysfunction

PULSATILE VS CENTRIFUGAL PRESERVATION OF DONOR KIDNEYS: ANALYSIS IN A PRE-CLINICAL RENAL TRANSPLANT MODEL

Kwong J, Bhattacharjee AN, Ruthirakanthan A, Richard-Mohamed M, Sun Q, Jiang L, , Mayer R, Haig A, Luke P

Introduction and Objective:
To improve postoperative outcomes following the use of deceased donor renal transplants, there is ongoing research in organ preservation techniques including pulsatile versus centrifugal perfusion. Pulsatile flow in organ preservation has been postulated to play a beneficial role in decreasing expression of inflammatory genes and increasing expression of vasculogenic enzymes. Our objective was to compare outcomes following pulsatile versus centrifugal perfusion in a porcine renal transplant model.

Methods:
We simulated in-situ warm ischemic donation after cardiac death conditions in six male Landrace pigs by renal pedicle cross-clamping for 30 minutes. Subsequently, all kidneys were procured, flushed with University of Wisconsin solution, and preserved with pulsatile versus centrifugal perfusion (n=6 per group). Preservation was performed for four hours at 22 degrees Celsius with a re-engineered RM3 (Waters Instrument Inc., Rochester, MN) pump circuit using oxygen carrying bovine hemoglobin (Hemopure):PlasmaLyte solution (1:3). The kidneys were then reperfused with oxygenated normothermic (37 degrees Celsius) autologous porcine blood for four hours. Outcome measures during reperfusion included urine output (mL/hour), serum creatinine (μmol/L), serum urea (mmol/L) urine protein (g/L) and renal venous blood flow (mL/min). Following reperfusion, kidney tissue was sectioned (5μm). Tissue sections were examined and graded (1 to 5) by a pathologist in a blinded manner for degree of acute tubular necrosis (H and E) and apoptosis (TUNEL). Statistical analyses were performed using GraphPad Prism 6.

Results:
Centrifugal preservation was associated with more urine output compared to pulsatile preservation (260 vs 69mL/hour). All other outcomes following pulsatile versus centrifugal preservation were similar, including serum creatinine (45 vs 41μmol/L), serum urea (3.0 vs. 2.5mmol/L), urine protein (3.1 vs 2.7g/L) and renal venous blood flow (77.6 vs 92.4mL/min) (p = NS for all). Kidney tissue pathology following pulsatile versus centrifugal preservation demonstrated similar degrees of acute tubular necrosis (grade 2.8 vs 2.4) and apoptosis (grade 4.2 vs 3.7).

Conclusion:
In our DCD renal transplant porcine model, we determined that centrifugal organ preservation was associated with higher urine output compared to pulsatile preservation. This may be related to higher perfusion pressure from continuous flow. However, all other outcomes reflecting renal function and injury, including serum, urine, venous blood flow and pathologic parameters (cell death and injury), were similar between techniques.

MISSED OPPORTUNITIES FOR DCD KIDNEY DONORS: EVALUATION OF WARM ISCHEMIC TIME AND ASSOCIATED FUNCTIONAL WARM ISCHEMIC TIME

Law J, Luke P

Introduction:
Although donation after circulatory death (DCD) renal transplants are associated with long-term outcomes comparable to that of donation after neurological donor death (NDD) transplants, hard cutoff of 2 hours warm ischemic time (WIT defined as time from withdrawal of life support to flush (WLST)) has been used to exclude the use of DCD donors. This has led to a loss of 30% of DCD donors in Ontario. It is not clear if functional WIT (fWIT) in DCD donors (sBP <50 mmHg) increases along with prolonged WIT.

Methods:
Retrospective review of all DCD renal donors in Ontario utilizing a Trillium Gift of Life Database from April 2013 to present in order to determine:
1. Number of potential DCD renal donors that died within the following periods post WLST: 0.5, 2, 4, 6 hours
2. Percentage of potential DCD renal donors at these different time points that die within 30 minutes of their systolic blood pressure falling below 50mmHg

Results:
Of 350 DCD renal donors analyzed, 46.9% had <0.5 hours, 51.7% between 0.5 - 2 hours and 1.4% >2 hours of WIT. Percent fWIT <30min were 100%, 94.4% and 100% respectively in each of these categories (p = NS). There were 106 potential donors who did not end up donating due to long WIT. Of these, 20.8% died within 4 hours, 10.4% between 4 – 6 hours and 68.9% beyond 6 hours.

Discussion:
Previous data have shown that fWIT greater or less than 30 min is not associated with any significant difference in outcome. The percentage of donors with fWIT > 30 min did not increase with increasing WIT in DCD donors that went on to donate organs. These data support consideration of increasing WIT to 4 hours as long as FWIT remains low. We will now evaluate the potential donors who did not end up donating who died between 2-4 hours and assess whether they had an acceptable fWIT (<30 min).

PEDIATRIC RECIPIENTS OF DECEASED ADULT DONOR KIDNEYS HAVE EQUIVALENT OUTCOMES COMPARED WITH PEDIATRIC DONORS

Mikhail D, Sharma H, Chen J, Cooper M, Sener A, Luke P.

Introduction:
Efforts are made to transplant paediatric deceased donor kidneys into pediatric recipients. To our knowledge, data does not support better graft outcomes with matched pediatric deceased donor transplants. We hypothesize that deceased donor kidneys from Pediatric Donors (under 18 years), have better long term graft outcomes compared to those received from adult donors.

Methods:
Donor and recipient data for transplants carried out between 2005-2010 was obtained from the UNOS database which was complete to March 2013. We identified all recipients that were 17 years of age and younger. We excluded recipients under 4 years and donors for whom KDRI (Kidney Donor Risk Index) variables were missing. Delayed Graft Function (DGF) and Death Censored Graft Survival (GS) outcome data was analyzed based on donor age ≤17 (Pediatric Donors) compared to donors 18 and older (Adult Donors). Matched-Pair analysis was performed. Graft Survival were compared using Kaplan-Meier curves and Cox- regression multivariate analysis.

Results:
Overall, 3034 pediatric kidney transplant recipients were identified, 10% were <4 years. Our matched pair analysis based on KDRI left us with 670 (26%) Pediatric Donors and 1878 (74%) Adult Donors. Average recipient age, sex and other factors were similar. Mean pediatric donor age was 13.7 years (CI 13.4 to 14) while mean adult donor age was 24.6 years (CI 24.3 to 24.8). DGF was not significantly different between the two groups (11% vs. 9%), although DCD adult donors have higher DGF (25% vs 10%, p=0.04). DCGS for the Pediatric and Adult groups were similar (p=0.08) at 1 year (95.2% vs. 94.9%) and median follow-up of 3.3 years (87.5% vs. 85.5%). Multivariate Cox-regression analysis showed that DGF (HR = 2.55) as well as recipient factors were associated with graft survival.

Discussion:
Analysis of pediatric deceased donor renal transplant recipients in the UNOS database shows no significant difference in delayed graft function nor graft survival when comparing pediatric and adult donors. Recipient factors and presence of DGF correlate with graft survival. Adult and Pediatric deceased donors are both associated with excellent outcomes in pediatric renal transplant recipients.

MRI-GUIDED TRANSURETHRAL ULTRASOUND ABLATION FOR LOCALIZED PROSTATE CANCER: PROSPECTIVE PHASE I CLINICAL TRIAL WITH 36 MONTH FOLLOW-UP

Chin J, Relle J, **Dewar M**, Hetou K, Kuru T, Hatiboglu G, Popeneciu IV, Hafron J, Röthke M, Mueller-Wolff M, Kassam Z, Staruch R, Burtnyk M, Bonekamp D, Schlemmer H-P, Pahernik S

Introduction and Objectives:
MRI-guided transurethral ultrasound ablation (MRI-TULSA) is a novel minimally invasive treatment modality for localized prostate cancer (PCa). A transurethral ultrasound applicator generates a precise image-guided volume, under the control of real-time MRI thermometry feedback control. The objective of this phase I clinical trial was to determine clinical safety and feasibility of MRI-TULSA for whole-gland prostate ablation as a primary treatment for localized PCa.

Materials and Methods:
A prospective multi-centre, single-arm trial was undertaken at 3 sites in Germany and Canada, enrolling patients between March 2013 and March 2014. Inclusion criteria were: age ≥65 years; biopsy-proven PCa (cT1c-T2a) with no previous treatment; PSA ≤10 ng/ml; Gleason score 3+3 (3+4 in Canada only); Prostate size ≤5 cm saggital length and ≤6 cm axial diameter; Eligible for MRI and general anesthesia. The protocol specified a safety margin of 3 mm from the gland periphery, leaving approximately 10% untreated gland. Primary endpoints were safety and feasibility, evaluated at 1 year. Secondary endpoints were efficacy, based on 1 and 3 year biopsies and PSA response, as well as measurement of impact on voiding, erectile, and bowel function.

Results:
A total of 30 patients were treated. No intraoperative complications, or postoperative incontinence, rectal injury, or fistula occurred. All were discharged on or before post-operative day one. One grade 3 adverse event occurred (epididymitis requiring IV antibiotics). Other adverse events were: hematuria (grade 1 in 13 patients, grade 2 in 2 patients); urinary retention (grade 1 in 3 patients, grade 2 in 5 patients). Heating of the prostatic tissue conformed well to the planned treatment area, and predicted area of cell kill correlated well with non-perfusion on immediate contrast-enhanced MRI. 16/29 patients (55%) had positive 12 month biopsy, with 9/29 (31%) having clinically significant cancer. Median IPSS and IIEF-15 scores were 8/35 and 13/30 at baseline, and 8/35 and 12/30 at 24 months, respectively. Prostate biopsy at 3 years showed 1/13 pts negative at 12-mo upgraded to 3+3 disease, 1/9 remaining pts positive at 12-mo upgraded to 3+4 disease, and 4/9 remaining pts positive at 12-mo down to 3+3 or negative biopsy. 9 patients with residual PCa were given salvage therapy – 6 with salvage radical prostatectomy, 1 with external beam radiotherapy, and one with photoselective vaporization of the prostate.

Conclusion:
MRI-TULSA provides detailed planning, real-time thermal dosimetry, and precise feedback control. It is a safe and well-tolerated procedure for whole-gland ablation of localized PCa. A larger multicenter TULSA-PRO Ablation Clinical Trial (TACT) with reduced safety margins is currently underway.

CONTRAST ENHANCED ULTRASOUND IN THE ASSESSMENT OF MALIGNANT PHENOTYPE IN SOLID RENAL MASSES

Rameswak D, **Chan G,** Mercer J, Lansdell K, Rowe N, Romagnoli C, Luke P

Introduction and Objective:
Benign or non-aggressive tumors can comprise up to 30% of small renal masses. Currently, it is difficult to differentiate benign from malignant masses utilizing conventional radiographic means. We evaluated the utility of contrast enhanced ultrasound (CEUS) to predict the histopathology of solid renal masses.

Methods:
With the use of a microbubble contrast agent, Definity, CEUS was used to evaluate patients with 58 solid renal masses, with mean age of patients 62. Ethics approval was obtained from Western University (REB#102009). Four main CEUS characteristics were evaluated in the renal masses: level of arterial enhancement compared to adjacent parenchyma, enhancement pattern (homogenous vs heterogenous), washout, and peri-lesional rim enhancement. Final pathology after surgical removal was then compared with preoperative CEUS characteristics. The radiologists read the CEUS results prior to pathologic interpretation.

Results:
Out of all renal masses investigated, 42 were confirmed renal cell carcinoma, 16 were benign lesions. Mean tumor size was 3.2 cm. Negative predictive value for benign lesion using the 4 CEUS criteria was >90%. The characteristic of having homogenous isoenhancement or hyper-enhancement has a high negative predictive value for having a benign tumor. Alternatively, if the tumor was heterogeneous in enhancement, nearly 95% of tumours were malignant. Adverse effects were minor and infrequent (<3%), including headache, flushing, back pain, nausea, chest pain and other allergic reactions.

Conclusion:
CEUS has the potential in differentiating malignant from benign small solid renal masses. We are currently conducting a larger blinded prospective study to these encouraging initial results.

INFLATABLE PENILE PROSTHESES IMPLANTATION: DOES ANTIBIOTIC EXPOSURE MATTER?

Clark R, Chanyi R, Brock G, Burton J

Introduction:
Inflatable penile prosthetic (IPP) infections are uncommon, but carry high patient morbidity and healthcare costs. Currently, there is no standard protocol to reduce or eliminate infections association with IPP's, and most clinicians use ad-hoc approaches which are not evidence-based. The objective of this project was to explore strategies to optimize prosthetic device antibacterial adherence with an aim to reduce infection risk.

Methods:
A modified disk-diffusion assay was developed to measure the zones of inhibition against *Escherichia coli*, *Proteus mirabilis*, *Staphylococcus aureus* and *Staphylococcus epidermidis* when tubing was immersed in either gentamycin, ampicillin, tetracycline, kanamycin, erythromycin or ciprofloxacin. To further assess the efficacy of this approach, IPP tubing was exposed to ampicillin or ciprofloxacin for 30 seconds, 2 minutes, 10 minutes or 60 minutes. Primary outcome was bacterial zones of inhibition against IPP tubing material exposed to various treatments.

Results:
IPP tubing was more effective against Gram-positive bacteria (*S. aureus* and *S. epidermidis*) than Gram-negative bacteria (*E. coli* and *P. mirabilis*). Immersing IPP tubing material in ampicillin or ciprofloxacin increased bactericidal effect of tubing material against Gram-positive and Gram-negative bacteria, respectively. The observed inhibitory effect was time-dependent.

Conclusion:
Immersing IPP material into an antibiotic solution, such as ampicillin and/or ciprofloxacin, increases the bactericidal properties and may aid in the prevention of infection. This study is limited in that it is *in vitro* experimentation observing the effect of a single strain of each bacterium. Although the strains used were clinically relevant, further analysis is required to determine if these results were strain specific.

MEAN OF MAXIMUM STANDARDIZED UPTAKE VALUE (SUV MAX) FROM PET IMAGING: A POSSIBLE PREDICTIVE PARAMETER FOR LOCALLY ADVANCED PROSTATE CANCER

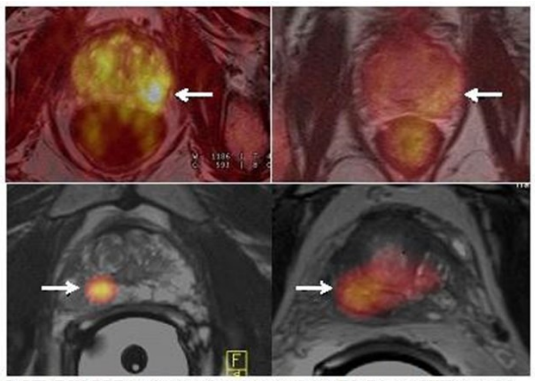
Hetou K, Bauman G, Thiessen J, Moussa M, Rachinsky I, Kassam A, Pautler SE, Dewar M, Lee TY, Valliant JF<, Ward A, Chin J

Introduction:
We acquired imaging data for men with prostate cancer using molecular agents [18F]-DCFpyl (targeted against prostate-specific membrane antigen, PSMA) and [18F]-Flurocholine ([18F]-FCH). Mean SUV max was calculated for each case. In addition to tumour location and extent information, we investigated the mean SUV max as a possible predictive marker for locally advanced prostate cancer.

Methods:
We examined 23 patients (pts) who had [18F]-FCH and 16 pts who received [18F]-DCFpyl PET imaging pre-prostatectomy (See figure for example of PET imaging in T2 and T3 patients using both tracers). Mean SUV max was calculated for each case. We examined the association of mean SUV max values with pre biopsy PSA and final pathological staging as well as tumour percentage in the final prostatectomy specimens.

Results:
In the [18F]-FCH Cohort: n=23, mean pre biopsy PSA was 5.9 SD 0.7. 47.8% had pT3 and 52.2 % had pT2 on final pathology. Mean SUV max in pts with pT3 group (5.52 SD 0.7) was higher than in pts with pT2 with mean SUV max 3.24 SD 0.35 (p=0.12). Higher tumour percentages were not associated with mean SUV max values in this group. Mean PSA among pts with pT3 disease was 7.42 SD 1.1 vs. 4.3 SD 0.73 among pts with pT2 disease in this group (p= 0.018).

In the [18F]-DCFpyl Cohort: n=16, mean pre biopsy PSA was 8.9 SD 1.57. 37.5 % had pT3 and 62.5 % had pT2 disease. Mean SUV max in pts with pT3 (12.53 SD 5.55) higher than in pts with pT2 with mean SUV max 2.62 SD 0.52 (p= 0.038). Higher tumour percentages were not associated with mean SUV max values. Mean PSA among pts with pT3 disease was 14.5 SD 2.73 vs. a mean PSA value of 5.49 SD 0.76 among pts with T2 disease in this group (p=0.0013).



[18F]-FCH PET imaging of patients with pT3 (Mean SUVmax 4.6, upper left) and pT2 (Mean SUVmax 3.26, upper right) and [18F]-DCFPyL PET imaging of patients with pT3 (Mean SUVmax 21.8, lower left) and pT2 (Mean SUVmax 3.23, lower right)

Conclusions:
Higher pathological staging showed univariable association with higher mean SUV max values. A larger sample size is needed to determine if PET SUV is an independent marker for higher risk prostate cancer in comparison to other biomarkers such as PSA and biopsy Gleason grade.

REVISION SURGERY FOR PENILE IMPLANTS: A RETROSPECTIVE REVIEW

Chan E, Punjani N, Abed H, Brock G

Introduction:
Penile prosthesis implantation is the standard of care for men with erectile dysfunction refractory to medical management. Revision surgery for IPPs is necessary in up to 40% of cases over 15 years. There is lack of clarity in terms of how risk factors can guide patient selection for prosthesis implantation and if these factors can predict need for revision surgery.

Methods:
We performed a retrospective review of all patients who underwent revision surgery for penile prosthesis between 2006 to 2018. All revision surgeries were performed by a single surgeon. Patient characteristics and intraoperative variables that were known risk factors for need for revision surgery were collected and analyzed.

Results:
A total of 112 patients met our inclusion criteria. Most had revision due to mechanical failure (53.6%). The incidence of infection in our sample was 6.3%. Patients with history of CAD (OR 7.46; p=0.04) and immunosuppression (OR 11.32; p=0.02) were more likely to have prosthesis infection. Patients with longer surgeries had slightly higher risk of prosthesis erosion (OR 1.04; p=0.04). Implantation of Coloplast 3-piece prosthesis was predictive of need for revision surgery (p<0.001), whereas malleable prosthesis was protective of need for revision surgery (p=0.005).

Conclusion:
Revision surgery following penile prosthesis implantation occurs primarily due to mechanical failure. The incidence of penile prosthesis infection in our sample was lower than previously described rates. This may due to patient selection, perioperative antibiotic regimen, or surgical technique. Patients with CAD or immunosuppression should be counseled on the increased risk of infection requiring revision surgery. Selection of device type may also influence need for and duration to revision surgery.

THE IMPACT OF COMMON UROLOGIC PROCEDURES AND COMPLICATIONS ON THE RISK OF A PROSTHETIC JOINT INFECTION

Punjani N, Lanting B, McClure A, Welk B

Introduction and Objective:
Prosthetic joint infections (PJI) after total hip arthroplasty (THA) and total knee arthroplasty (TKA) are significant complications. The purpose of this study is to determine if the complications of urinary tract infection (UTI) and acute urinary retention (AUR) and if the urologic procedures of cystoscopy and transurethral resection of the prostate (TURP) are significant risk factors for PJI after THA or TKA.

Methods:
Using administrative data, we performed a retrospective population-based cohort study of patients >66 years old in Ontario undergoing a first time THA/TKA between April 1, 2003 and March 31, 2013. For complications, we reviewed post-operative UTI within 2 years of THA/TKA, and AUR within 30 days of THA/TKA. For procedures, we reviewed cystoscopy or TURP within two years of THA/TKA. Our primary outcome was PJI requiring hospital admission following THA/TKA. Cox proportional hazards models were used and we adjusted for numerous covariates.

Results:
A total of 113,061 patients met inclusion criteria and had arthroplasties during the study period (44,495 with THA and 68,566 with TKA). Median age was 74 (IQR 70-79) and 40% were male. At least one UTI was seen in 28,256 (25.0%), and a total of 2,516 (2.2%) patients had AUR. For procedures, 8,426 (7.5%) patients had cystoscopy and 1,095 (2.5%) patients had a TURP within 2 years of THA/TKA. A total of 1,262 (1.1%) patients had PJI requiring hospital admission at a median of 86 days after implantation (IQR 21-377). In multivariate Cox regression analysis, UTI was associated with an increased risk of PJI (HR 1.21, 95%CI 1.14-1.28, $p<0.01$). However multivariate analysis did not demonstrate an association with AUR and PJI (HR 0.99, 95% CI 0.60-1.64, $p=0.98$). Similarly, in multivariate analysis, there was no significant association between cystoscopy and PJI (HR 1.05, 95%CI 0.85-1.30, $p=0.66$). The HR was still non-significant when considering only patients who underwent cystoscopy without antibiotic prophylaxis. In multivariate analysis TURP was a significant risk factor for PJI (HR 3.42, 95%CI 1.29-9.10, $p=0.01$).

Conclusion:
UTI is associated with increased risk of PJI of THA or TKA, whereas acute urinary retention is not a significant risk factor. Contemporary cystoscopy is a noninvasive procedure with no significant risk of PJI, whereas TURP, a more invasive procedure, does appear to be associated with an increased risk of PJI. Therefore, timely and appropriate treatment of symptomatic UTIs may be important in the prevention of PJI and based on risk following urologic procedures, rationale use of antibiotic prophylaxis should be taken into account when revisiting societal antibiotic prophylaxis guidelines.

TO TURP OR NOT TO TURP: HOW DO UROLOGISTS USE NONTRADITIONAL URODYNAMIC RESULTS WHEN TREATING MALE LOWER URINARY TRACT SYMPTOMS?

Welk B, **McGarry P**, Baverstock R, Carlson K, Hickling D

Aims:
To determine how urologists approach unusual urodynamic findings when a transurethral resection of prostate (TURP) is being considered.

Methods:
We created four clinical scenarios featuring a healthy 65 year-old man. An electronic survey was distributed to members of the International Continence Society, and the Society for Urodynamics and Female Pelvic Medicine, & Urogenital Reconstruction.

Results:
86 urologists responded and completed at least one scenario. Median age was 45-54 years, 62% described their practice as academic, 36% of respondents estimated that they did more than 50 TURPs per year and 41% generally performed urodynamics before TURP. Scenario 1: an incidental residual urine >1L who has detrusor underactivity. The majority (76%) would offer a TURP, however the estimated chance that his residual volume would improve was only 57%. Scenario 2: catheter-dependent retention, with detrusor overactivity but no voluntary voiding contraction. The majority (72%) would offer a TURP, however the average chance quoted that he would void was only 48%. Scenario 3: catheter dependent retention and an underactive detrusor. The majority (89%) would offer a TURP, however the average chance quoted that he would void was only 53%. Scenario 4: a man with only frequency/urgency, but urodynamic obstruction. The majority (90%) would offer him a TURP, however the average chance that his frequency and urgency would improve was only 64%, and the average estimated post-op risk of urgency incontinence was 33%. Hydronephrosis, urinary tract infections or catheter intolerance made it more likely that the patient would be offered a TURP. Willingness to offer TURP in these scenarios did not correlate with physician characteristics.

Conclusion:
Even with urodynamic results that are not traditionally an indication for a TURP, this operation is often recommended despite the modest results that are expected. Further research is needed to better define treatment outcomes and the natural history of these clinical situations.

THE TIMES THEY ARE A-CHANGIN': ANALYSIS OF A SINGLE INSTITUTION EXPERIENCE IN PERCUTANEOUS NEPHROLITHOTOMY OVER 25 YEARS

Bjazevic J, Kwong J, Nott L, Denstedt JD, Razvi H

Introduction and Objective:
The incidence of nephrolithiasis and the use of percutaneous nephrolithotomy (PCNL) has risen significantly over the years. PCNL aims to achieve a high stone-free rate with a low risk of complications. The objective of our study was to determine the impact of changes in patient demographics and surgical techniques over a 25-year time period, on PCNL outcomes.

Methods:
A retrospective analysis on a prospectively maintained database, including 2554 consecutive PCNL treatments in 2486 patients from July 1990 to July 2015 was undertaken. Collected data included patient demographics, comorbidities, stone and procedure characteristics, adverse events, and stone-free status at three-month follow-up. Adverse events were categorized according to the Clavien-Dindo classification. Patients were divided into equal terciles, each representing 852 consecutive procedures, ordered chronologically. Chi squared test was used to evaluate changes in patient characteristics and surgical techniques over time. A multivariate logistic regression was used to identify the effect of time on operative duration, adverse events, stone-free rate and hospital length of stay.

Results:
Our cohort had a mean age of 54 ± 15 years, was 66.6% male, had a mean body mass index (BMI) of 31 ± 8, and a mean stone surface area of 895 ± 602 mm^2. Medical comorbidities were present in 46.9% of patients, most commonly hypertension (22%), diabetes (14%), and cardiac disease (13%). Overall complication rate was 15.6%, including a 2.5% rate of major complications (Clavien grade 3-5). Three-month follow-up of 1873 available patients showed esidual stones in 13.3%. Over time there was a statistically significant increase in patient age, BMI, comorbidities, and ASA score. Over time, both OR duration (mean D 16 mins, $p<0.001$) and hospital length of stay (mean D 3 days, $p<0.001$) decreased significantly. Intra-operatively, there was an increase in the use of the balloon dilator and ultrasonic lithotripter ($p<0.001$). Stone-free rate decreased significantly over time (OR 1.09, $p<0.001$), but was correlated with an increased use of CT scans for follow-up imaging. There was an increased complication rate with time (OR 1.15, $p=0.010$); however, this was correlated with the increased rate of medical comorbidities. The overall transfusion rate was 1.0%, and did not change over time ($p=0.131$).

Conclusion:
Despite an increasing complex patient population PCNL remains a safe and effective procedure for the management of large and complex urolithiasis; resulting in a high stone-free rate and low risk of complications.

THE ABILITY OF BACTERIA TO ENHANCE CALCIUM OXALATE CRYSTAL FORMATION: AN IN-VITRO STUDY

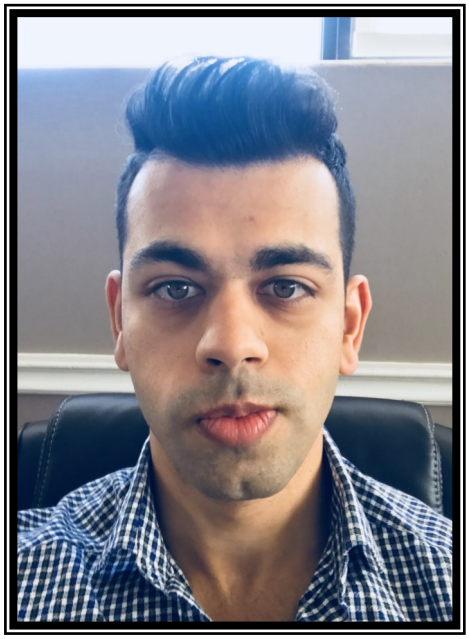
Alathel AH, Macdonald K, Gorla J, Yu K, Burton J, Razvi H

Introduction:
Kidney stones are a common, painful, and costly medical condition and their prevalence appears to be on the rise. The majority (~80%) of these stones have Calcium oxalate (Ca-Ox) as their primary constituent. Multiple components have been described to inhibit the formation of stones, these include but are not limited to: osteopontin, citrate, nephrocalcin, Tamm-Horsfall glycoprotein, Magnesium and heparin sulfate. Next-generation sequencing and extended culturing techniques have shown that even Ca-Ox stones harbor bacteria, even using standard culturing techniques. An association was also linked between antibiotic use and incident kidney stones. Researchers have constructed multiple in-vitro models to create Ca-Ox stones, in hopes to test a plethora of theories. Our Aim in this study is to create an easily reproducible in-vitro model to create Ca-Ox stones, in which we could also test the effects of different components on the formation of these crystals. We also set our aim to assess the effects of the usual uropathogenic bacterial culprits in the formation of Ca-Ox stones.

Methods:
An ideal environment in which we could grow the Calcium Oxalate crystals in was constructed. We used paper discs that were 2 cm apart loaded with 30 microliters of 100 mmol of sodium oxalate on one disc and calcium chloride on the other. We tested the effects on multiple stone inhibitory products on crystal formation. We also assessed the effects bacteria had on their formation. Antibiotics were also tested, to examine if they had any influence on stone formation. We also tested if the urine of a patient afflicted with calcium oxalate stones had any effect on the formation of these crystals.

Results:
The results show a consistent increase in the density of the Ca-Ox crystal streak in all bacterial plates. As expected most of the known inhibitory substances exhibited a clear inhibitory effect but with varying extent. Most notable results were recognized with citrates. Our outcomes didn't show any significant changes with antibiotics on Ca-Ox crystal formation. Two notable exceptions to these findings were Ciprofloxacin and Nitrofurantoin, they caused noticeable decrease in Ca-Ox crystal formation. Results on testing the effect a stone forming patient's urine showed a 37.84% reduction in the intensity of the crystals created on that patient's disc.

Conclusion:
A robust, efficient, quick and easily reproducible in-vitro model to create Ca-Ox stones was created, which could be used to screen different reagents. The results demonstrated a uniform increase in Ca-Ox crystals density when different bacterial pathogens influenced their formation. These findings to carry a valuable clinical impact, knowing that a patient with nephrolithiasis and an associated urinary tract infection would probably drive the physician to hasten the time needed to intervene in hopes of not dealing with a larger burden of stones if treatment was to be delayed.



ASSESSMENT OF FIREFLY TECHNOLOGY IN ROBOTIC PARTIAL NEPHRECTOMY

Sami S, Mikhail D, Dawidek M, Morris J, Luke P

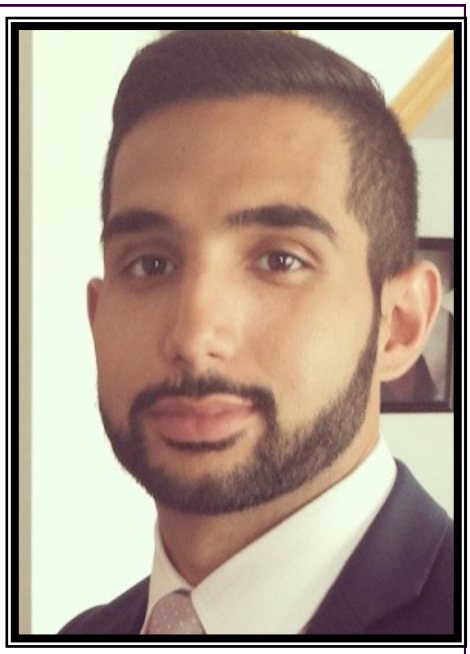
Objective:
Use of Indocyanine Green (ICG) fluorescence technology for intraoperative tumour localization is becoming more widespread in minimally invasive surgery. Our centre was the first in Canada to have near-infrared fluorescence imaging technology available with the Da Vinci Surgical System (Intuitive Surgical, USA). We retrospectively evaluated perioperative, oncological and renal functional outcomes of Robotic assisted Partial Nephrectomy (RPN) with and without the use of intraoperative ICG.

Methods:
Since 2013, a total of 46 patients underwent RPN. Of these, 25 were given intraoperative ICG prior tumour excision. We compared these to 21 RPNs over the same time period, during which intraoperative ICG was not used. Patient factors, perioperative, and long term outcomes were collected retrospectively. Statistics comparing oncological and renal function outcomes were performed using GraphPad Prism 6 (GraphPad Software, USA).

Results:
Patient demographics and tumour complexity using nephrometry score were similar between both groups. Renal artery clamp times were not statistically different between both groups (21.75 min in ICG group vs 24.95 minutes in non-ICG group , P = 0.19). Positive margin rates were minimal in both groups. Post-operative GFR decline from baseline did not show statistical difference at 8 weeks between the ICG and non-ICG groups, respectively (-7 ml/min vs. -13 ml/min, p= 0.07). No adverse events were associated with ICG dye administration.

Conclusion:
Our initial assessment of ICG in robotic partial nephrectomy has not yet shown improvements in margin rates, warm ischemia time, improvements post-operative GFR. The trends towards shorter clamp times and improved renal functional recovery indicate potential favourable outcomes with greater experience.

IMPACT OF COMORBIDITY ON LONG-TERM OUTCOMES IN PATIENTS UNDERGOING RADICAL NEPHRECTOMY COMPARED TO PARTIAL NEPHRECTOMY: A POPULATION-BASED RETROSPECTIVE COHORT STUDY



Brar H, Breau RH, Kapoor A, Rowe N, Cristea O, Chan G, Nash DM, Dixon SN, McArthur E, Tajzler C, Kumar R, Vinden C, Izawa J, Garg AX, Luke PP

Introduction:
The benefits of partial nephrectomy over radical nephrectomy in the treatment of small renal masses with regards to overall long-term mortality and morbidity remain controversial. Frailty has been shown to be a predictor of poor outcomes in surgery. It is unclear whether patients with medical co-morbidities (frail) are advantaged by partial nephrectomy over radical nephrectomy.

Methods:
Medical records and the Institute for Clinical Evaluative Sciences databases were used to assess patient outcomes. Comorbidity was estimated using the Johns Hopkins Adjusted Clinical Group (ACG) system which provided Aggregated Diagnostic Groups (ADG) scores. This score was determined based on health care resource use, procedures, and diagnoses in the year prior to nephrectomy, with a higher score indicative of greater expected resource utilization. The primary outcome was all-cause mortality, with two pre-specified comorbid groups: ADG <7.5 or ≥7.5. In addition to mortality, secondary outcomes included major cardiovascular events and non-cancer related mortality. A sub-group analysis of pre-existing diabetes and eGFR <60 or ≥60 stratified by ADG of 7.5 was also examined for all-cause mortality.

Results:
Between 2002-2010, we identified 575 partial and 882 radical nephrectomies for tumors measuring ≤7cm at 3 academic centers. The mean (standard deviation) 1-year post-operative eGFR was 71 (22) mL/min/1.73 m^2 in the partial nephrectomy group, and 52 (13) mL/min/1.73 m^2 in the radical nephrectomy group**.** Mortality rates were highest in the ADG ≥7.5 group with 2.9 vs 1.5 per 100 person years in the partial nephrectomy group and 4.9 vs 3.4 per 100 person years in the radical nephrectomy group. However, there was no evidence that radical vs. partial nephrectomy affected all-cause mortality HR in either ADG comorbidity stratification: ADG <7.5 HR 1.62, 95% CI (1.04-2.52) and ADG ≥7.5 HR 1.29, 95% CI (0.87-1.89) (p=0.46). No differences between partial and radical nephrectomy were seen with regards to non-cancer mortality and cardiovascular death in both ADG groups. Sub-group analysis of patients with pre-existing diabetes and low eGFR did not show differences in outcomes between radical and partial nephrectomy.

Conclusions:
The absolute death rate was nearly doubled in the higher comorbid group, indicating ADG scoring properly risk stratify these patients. However, patients with comorbidity were not advantaged by partial nephrectomy with regards to all-cause mortality, non-cancer mortality and cardiovascular death vs. radical nephrectomy.

ASSESSING GENDER TRENDS IN ACCEPTANCE TO UROLOGY RESIDENCY

Stringer L, Morris H, Sener A, Stitt L

Introduction: The number of female medical students is increasing and therefore the number of females entering the work force as qualified physicians is also increasing. Despite this trend, there are still surgical specialties that are considered male dominant. Urology specifically has a significant male predominance in both residency and independent practice. This male predominance could have an impact on the physician work force, mentorship opportunities for females pursuing surgery and on medical student attraction to urology as a specialty. Research conducted in the United States has shown that in recent years, although less females enter the field of urology, acceptance rates between the two genders are similar. This study aims to identify if a trend towards gender specific acceptance into urology residency exists within Canada.

Hypothesis: After reviewing CARMS statistics over the past ten years, we suspect that there will be a significant difference in the rates of female versus male success in acceptance to urology. We suspect there will be a trend towards higher rates of male acceptance compared to female.

Methods:
Canadian Residency Matching Services (CARMS) data from the previous ten years was analyzed. Logistic regression analyses were used to assess if any significant difference exists between the rates of female and male applicant acceptance into urology. These rates were then compared to the rates of female and male acceptance into surgical residency as a whole.

Results:
Within urology applicants, there is no evidence that the success rate over time between males and females differs ($p = .47$). Likewise, within surgical residency applicants, there is no evidence that the success rate over time differs between male and female applicants ($p = .84$). In comparing these two rates, there is also no significant difference between rates of acceptance to urology versus surgery in general for female applicants ($p = .45$).

Conclusion:
Overall, our data identifies that there is no significant trend toward male acceptance into urology over female applicants. There is no significant difference related to women acceptance specifically into urology or any difference between rates of females accepted into urology as compared to all other surgical subspecialties combined. Our data is in agreement with American statistics finding similar results.

LIFE AND DEATH AFTER THE DEATH OF CANCER: A STUDY OF POPULATION HEALTH AND DYNAMICS, AND HEALTHCARE SUSTAINABILITY

Huynh M, Hahn M, McIntyre C, Power N

Introduction:
Cancer is the leading cause of death in Canada and the second most common cause of death in the United States after heart disease. The advances in research that have been made over the years have translated into decreasing mortality rates despite increasing incident rates of cancer. While we may be years and years away from eradicating cancer as a cause of mortality, one day, that moment will arrive. But are we ready for it?

Objectives:
The objective of this study is to provide insight into the question, "What would happen if we cured cancer tomorrow?" Our goal is to estimate the socioeconomic impact of the absence of cancer on our healthcare system, as well as explore the additional productivity and societal contributions by those cancer survivors who would have otherwise died. In addition, we aim to characterize which disease entities will emerge as the main drivers of human mortality in the absence of cancer, and the effect of curing cancer on population growth and dynamics.

Methods:
Statistics Canada data was used to gather information regarding national cancer care, including demographics, hospital visits, and financial burden of the disease. Probability of mortality pertaining to cardiovascular disease, infectious disease, chronic respiratory tract illnesses, diabetes, dementia, and accidental deaths over serial time points were extracted to make projections as the first phase of building our cancer cure model. Stata statistical software was used for simplistic multivariate analyses, ordinary least squares regression and logistic regression models.

Conclusion:
With our increasingly paced technological advances in oncologic care out of step with ever mounting healthcare obstacles, we have an obligation to future generations to anticipate changes in disease dynamics. We present out first phase of data and projections for a world and a future in which cancer is not the leading cause of death.

IDENTIFYING POSITIVE CHARACTER TRAITS IN SURGICAL RESIDENT APPLICANTS: AN INITIAL PROSPECTIVE COHORT STUDY EVALUATING THE OCEAN-20 QUESTIONNAIRE FOR UROLOGY RESIDENT APPLICANTS

Morris H, Stringer L, Wang P, Sener A, Chahine S, Dave S

Background:
Previous research has shown that surgeons demonstrate different personality traits than non-surgeons, and that this knowledge could benefit the selection process for surgical residency programs. OCEAN-20 is a validated tool to assess 5 personality domains (neuroticism, extraversion, openness, agreeableness and conscientiousness), which has correlated with academic achievement, training performance, and teamwork in the military setting. This prospective cohort study aims to validate this tool for use with medical students as part of the residency selection process.

Methods:
OCEAN-20 was administered to all CaRMS applicants to the Urology program at Western over 2 years, as well as current urology residents and urology faculty (2015-2016, n=48). The 20 questions comprising the test were answered over 3 minutes. The total scores were compared across the participants to assess construct validity using Kaiser-Meyer-Olkin and Bartlett's test of sphericity. Additionally, items making up each domain were assessed to evaluate intra-rater consistency using Cronbach's alpha.

Results:
The domain-specific scores for participants were 4.2 ± 0.2 (mean ± SD) for openness, 5.1 ± 0.2 for conscientiousness, 3.5± 0.2 for extraversion, 6.1± 0.2 for agreeableness and 1.9± 0.1 for neuroticism. Intra-rater agreeability between the questions of the 5 domains demonstrated a Cronbach alpha score between 0.68-0.89, suggesting that applicants answered each of the 5 domain questions in a similar fashion in most domains. Kaiser-Meyer-Olkin valued to 0.587 and Bartlett's test of sphericity valued to 469.684 ($p<0.000$), suggesting that exploratory factor analysis was appropriate for this sample.

Conclusion:
OCEAN-20 may be an adjunctive tool to objectively evaluate the personality traits of prospective applicants. Preliminary results demonstrate fair internal consistency and construct validity for this questionnaire to be used to assess personality traits in medical personnel. Further studies need to be conducted to improve sample size and to assess its use in other programs.

PAST RESIDENTS' DAY GUEST PROFESSORS
1984 – 2018

2017 Dr. Arthur L. Burnett

2016 Dr. Philipp Dahm

2015 Dr. E. Ann Gormley

2014 Dr. Joel B. Nelson

2013 Dr. Stephen Nakada

2012 Dr. Lawrence Klotz

2011 Dr. Gerald Andriole

2010 Dr. John Michael Fitzpatrick

2009 Dr. Antoine Khoury

2008 Dr. Margaret Pearle

2007 Dr. Martin Gleave

2006 Dr. Leonard Zinman

2005 Dr. Joseph A. Smith Jr.

2004 Dr. Anthony Atala

2003 Dr. Peter T. Scardino

2002 Dr. Inderbir Gill

2001 Dr. Shlomo Raz

2000 Dr. Donald Lamm

1999 CUA in London, no Residents' Day

1998 Dr. Patrick Walsh

1997 Dr. Joseph Oesterling

1996 Dr. Michael Marberger

1995 Dr. E. Darracott Vaughan

1994 Dr. Martin Resnick

1993 Dr. Andrew Novick

1992 Dr. Howard Winfield

1991 Dr. Moneer Hanna

1990 Dr. Drogo Montague

1989 Dr. Ralph Clayman

1988 Dr. Gerald Sufrin

1987 Dr. Alvaro Morales

1986 Dr. J. Edson Pontes

1985 Dr. Alan Perlmutter

NOTES