

Poster Session 5: Medical Education and Patient Outcomes June 27, 2016 0800-0930

MP-05.01

The impact of teaching on the duration of common urological operations

Welk, Blayne K.^{1,2,3}; Winick-Ng, Jennifer²; McClure, Andrew²; Vinden, Chris^{1,2}; Dave, Sumit¹; Pautler, Stephen E.¹

¹Surgery, Western University, London, ON, Canada; ²Institute for Clinical Evaluative Sciences, London, ON, Canada; ³Epidemiology and Biostatistics, Western University, London, ON, Canada

Introduction and Objectives: Performance-based funding models for hospitals are being introduced in Canada. The ability of teaching hospitals to offer the same level of efficiency as non-teaching hospitals is unknown. Our objective was to compare the operative duration of general urology procedures between teaching and non-teaching hospitals.

Methods: We used administrative data from the province of Ontario to conduct a retrospective cohort study of all adults who underwent a specified elective urology procedure (2002-2013). Primary outcome was duration of surgical procedure. Primary exposure was the type of hospital (teaching or non-teaching). Negative binomial regression was used for adjusted relative time estimates.

Results: 114 225 procedures were included (midurethral sling=15 707; transurethral prostatectomy=56 066; hydrocele repair=7221; circumcision=12 280; and open radical prostatectomy=22 951). These procedures were performed in a teaching hospital in 21%, 17%, 13%, 15%, and 29% of cases, respectively. The mean operative times for all procedures were higher in teaching centres; the additional operative time ranged from 8.3 minutes (circumcision) to 29.2 minutes (radical prostatectomy). In adjusted analysis (accounting for age, comorbidity, obesity, anesthetic, and surgeon case volume), the patients treated in teaching hospitals continued to have significantly longer procedures (Fig. 1). These results were similar in sensitivity analyses, which adjusted for the potential effect of more complex patients being referred to tertiary centres.

Conclusions: Five common general urology operations take on average 9-21% longer in teaching hospitals. This may be due to the combined effect

of teaching students and residents, or this may be due to inherent systematic inefficiencies within large teaching hospitals. The potential operating room inefficiencies introduced by training future medical professionals should be adjusted for in future hospital funding models.

MP-05.02

Robotic surgical skill acquisition in trainees: A randomized comparison of the two robotic trainers and trainees' skills transfer to a 3D printed simulated surgical task in the operating room

Wong, Nathan C.¹; Hoogenes, Jen¹; Alharbi, Badr¹; Vij, Saahil¹; Kim, Kevin¹; Bolognone, Elisa¹; Shayegan, Bobby¹; Quantz, Mackenzie A.²; Matsumoto, Edward D.¹

¹Urology, McMaster University, Hamilton, ON, Canada; ²Surgery, Division of Cardiac Surgery, University of Western Ontario, London, ON, Canada

Introduction and Objectives: With competency-based education on the horizon, there is a growing need for objective methods for evaluating technical ability. The dV-Trainer (dVT) and the da Vinci Surgical Skills Simulator (dVSSS) are virtual reality robotic simulators that use the same software and objective metrics. We aimed to determine how skills acquired on these two simulators transfer to performing an urethrovesical anastomosis (UVA) on a high-fidelity 3D printed bladder model in the OR using the da Vinci robot.

Methods: Medical students (MS) and junior residents (JR) were recruited through program directors via email. Participants were randomized to training sessions on either the dVT or dVSSS. All participants completed the identical curriculum. They watched a video of a live UVA and subsequently performed it on the high-fidelity model. Pre- and post-training surveys were collected. Scores (/100) were obtained from the software and three robotic surgeons independently evaluated videos and final end product of the UVA in accordance to previously validated scoring systems (GEARS (/25) and RACE (/25)). All analysts and evaluators were blinded.

Results: A total of 26 participants (11 MS and 15 JR) were recruited and randomized to the dVT and dVSSS. Mean age was 25.5 and 53.8% were

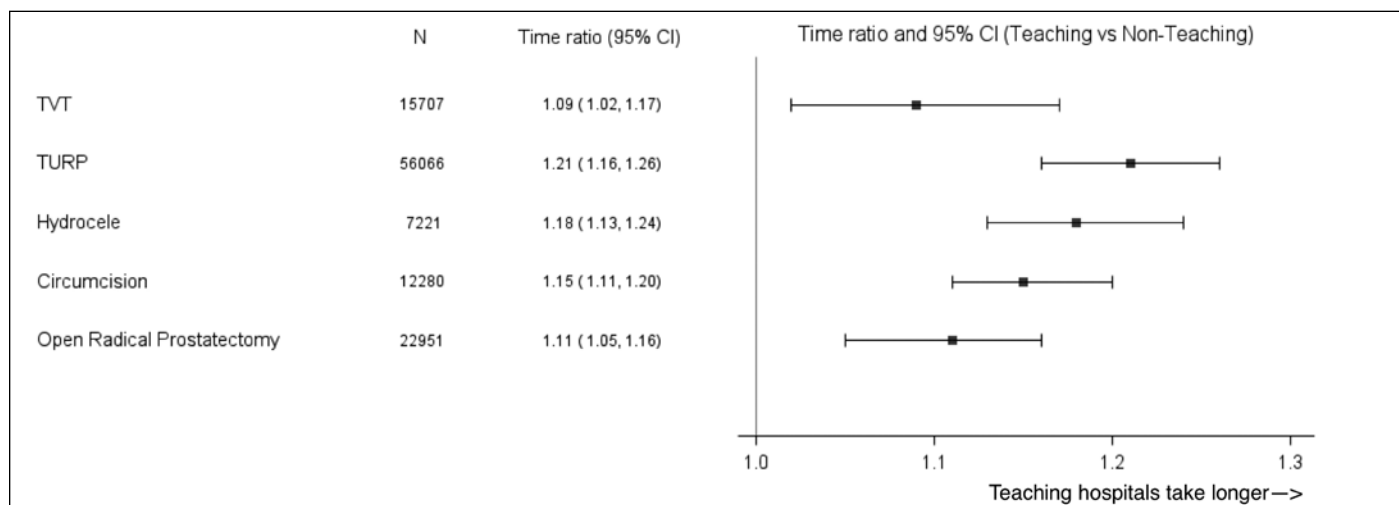


Fig. 1. MP-05.01.

females. The average scores for the dVT and dVSSS were 10 and 48.5/100 respectively. Scores of MS and JR were similar ($p=0.36$). Both GEARS and RACE scores of participants who used the dVSSS compared to the dVT were significantly higher (GEARS: 21/25 vs. 17.2/25, $p=0.04$; RACE: 23.2/25 vs. 17.8/25, $p=0.02$). Scores of MS and JR were similar for GEARS ($p=0.50$) and RACE scores ($p=0.57$). Intraclass correlation coefficient for the GEARS and RACE scoring were 72.6 and 89.3, respectively.

Conclusions: The dVSSS lead to superior scores in performing UVA in the OR for both MS and JR compared to the dVT. The dVSSS can be used to improve teaching in surgical trainees in a safe and effective manner.

MP-05.03

Trends in the training of female urology residents in Canada

Anderson, Kate¹; Tennankore, Karthik²; Cox, Ashley R.¹

¹Urology, Dalhousie University, Halifax, NS, Canada; ²Medicine, Dalhousie University, Halifax, NS, Canada

Introduction and Objectives: With the increasing proportion of females graduating from Canadian medical schools, many surgical subspecialties have seen an increase in female trainees. To date, there is limited research on why females do or do not choose a career in urology. The objective of this study was to assess for secular trends in the proportion and success of Canadian female urology applicants.

Methods: In this descriptive study, publically available data from the Canadian Residency Matching Service (CaRMS) website was collected. Information regarding the number of urology spots, total number of first choice applicants, and total number of applicants successfully matched to urology as a first choice was collected. Trends in the proportion of female applicants who ranked urology as their first choice and who successfully matched to urology as their first choice were also compared to trends in the overall proportions of females entering the CaRMS match and those applying to surgical specialties overall. Data was analyzed using a Chi-square test for trends in proportions.

Results: Available CaRMS data was complete from 1998-2015. We found a large amount of year-to-year variation in the data. Therefore, data was analyzed based on four-year increments, representing medical school cohorts. We found an increasing trend in the number of female CaRMS applicants overall ($p<0.001$), in the number of females ranking a surgical program as first choice ($p<0.001$), and in the number of females successfully matching to a surgical program ($p<0.001$). With respect to urology, we found a trend towards an increasing number of females ranking urology as their first choice program ($p=0.04$), but statistically, we did not confirm a trend towards an increasing number of females successfully matching to urology as their first choice program ($p=0.07$). Despite the lack of statistical significance, the graphical representation of this data did show a positive trend, which mirrors the trends seen in surgical programs overall.

Conclusions: Over the last 18 years in Canada, more females medical students are applying to urology, which may reflect the overall increase

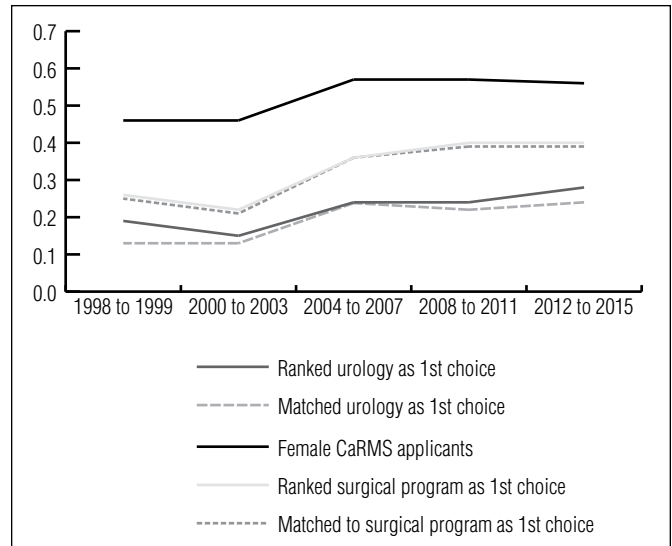


Fig. 1. MP-05.03. Trends in the proportion of female urology applicants.

in the number of female applicants within the CaRMS match and mirrors what is seen in surgical programs overall. Similar to surgical programs overall, there also appears to be an increase in the number of females who are successful in matching to urology as their first choice specialty.

MP-05.04

Risk of venous thromboembolism after urological procedures

McAlpine, Kristen^{1,2,3}; Breau, Rodney H.^{1,2,3,4}; Mallick, Ranjeeta⁴; Crossen, Sonya⁴; Cagiannos, Ilias^{1,2,3,4}; Morash, Christopher G.^{1,2,3,4}; Lavallee, Luke T.^{1,2,3,4}

¹Division of Urology, The Ottawa Hospital, Ottawa, ON, Canada;

²Department of Surgery, The Ottawa Hospital, Ottawa, ON, Canada;

³School of Medicine, University of Ottawa, Ottawa, ON, Canada; ⁴Ottawa

Hospital Research Institute, The Ottawa Hospital, Ottawa, ON, Canada

Introduction and Objectives: Venous thromboembolism (VTE) is an important cause of morbidity and mortality following urological procedures. Determining the rate and timing of VTE for individual procedures will improve patient counselling and allow an evidence-based application of VTE prophylaxis strategies.

Methods: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was reviewed from 2006-2014. Current procedural terminology (CPT) codes for similar surgical procedures were grouped together. Baseline patient characteristics were recorded. The primary outcome was the incidence of VTE. Secondary

Table 1. MP-05.04. Incidence of VTE after urological surgery

Rank	Procedure	n	VTE overall (%)	% of VTE occurring after discharge
1	Cystectomy	5973	5.0	50
2	Open nephrectomy	5586	2.2	31
3	Adrenalectomy	390	2.1	37
4	Partial cystectomy	524	1.9	48
5	Suprapubic prostatectomy	525	1.9	90
6	Open nephroureterectomy	678	1.9	54
7	Ureteric reimplantation	217	1.8	50
8	Penectomy	67	1.5	12
9	Laparoscopic nephroureterectomy	1681	1.5	48
10	Open partial nephrectomy	4007	1.1	58

outcomes included the overall incidence of VTE for all patients and the timing of VTE (in-hospital vs. out-of hospital). Absolute rates of VTE and VTE rates out-of-hospital were ranked by procedure type.

Results: We reviewed 137 968 patients who had a urological procedure. The overall risk of VTE in all patients was 0.9%. The highest incidence of VTE occurred with radical cystectomy (5.0%), open radical nephrectomy (2.2%), open adrenalectomy (2.1%), partial cystectomy (1.9%), and open nephroureterectomy (1.9%) (Table 1). Among the 10 highest VTE risk procedures, 47% of VTEs occurred after discharge from hospital. Over 50% of patients receiving these procedures had multiple risk factors for VTE, including age >60 years, body mass index >25, and operative time >45 minutes.

Conclusions: Risk factors for VTE, including advanced age, presence of malignancy, elevated body mass index, and receipt of major surgery, are common for urology patients. Risk of VTE varies by surgical procedure, therefore, strategies for VTE prophylaxis should be tailored to procedure risk.

MP-05.05

International survey on use of thromboprophylaxis in urological surgery (ISTHMUS)

Violette, Philippe D.¹; Agarwal, Arnav^{2,3}; Aoki, Yoshitaka⁴; Cartwright, Rufus^{5,6}; Novara, Giacomo⁷; Tailli, Thomas¹; Arai, Yoichi⁸; Craigie, Samantha^{2,9}; Guyatt, Gordon H.^{2,10}; Tikkinen, Kari A.O.^{11,12}

¹Department of Surgery, Division of Urology, University of Western Ontario, London, ON, Canada; ²Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada; ³School of Medicine, University of Toronto, Toronto, ON, Canada; ⁴Department of Urology, Faculty of Medical Sciences, University of Fukui, Fukui, Japan; ⁵Department of Epidemiology and Biostatistics, Imperial College London, London, United Kingdom; ⁶Department of Urogynecology, St. Mary's Hospital, London, United Kingdom; ⁷Department of Surgical, Oncological, and Gastroenterological Sciences, Urology Clinic, University of Padua, Padua, Italy; ⁸Department of Urology, Tohoku University School of Medicine, Miyagi, Japan; ⁹Michael G. DeGroote Institute for Pain Research and Care, McMaster University, Hamilton, ON, Canada; ¹⁰Department of Medicine, McMaster University, Hamilton, ON, Canada; ¹¹Department of Urology, Helsinki University Central Hospital and University of Helsinki, Helsinki, Finland; ¹²Department of Public Health, University of Helsinki, Helsinki, Finland

Introduction and Objectives: The use of thromboprophylaxis to reduce the risk of venous thromboembolism (VTE) in urological surgery is common, but not standardized. We have conducted an international survey to assess current practice variation globally.

Methods: We developed a survey addressing the use of mechanical and pharmacological thromboprophylaxis for three common urological procedures: cystectomy (Cx), radical prostatectomy (RP), and nephrectomy (Nx). The survey presented three brief patient profiles that reflected a spectrum of VTE risk; respondents indicated their practice for each. Following pilot testing, we administered the survey to representative samples of urologists in Canada, Finland, and Japan. Within-country and between-country variation are described using counts and percents with Chi-square and ANOVA analysis where appropriate. Multivariable logistic regression was used to identify characteristics associated with discharge pharmacological prophylaxis.

Results: We received a total of 570 eligible responses (Canada 216 of 382, 56.5%; Finland 109 of 179, 60.9%; and Japan 244 of 487, 50.1%). Large between-country variation was observed in pharmacologic prophylaxis for each procedure. Urologists in Finland were most likely to prescribe prophylaxis post-discharge (95% Cx, 75% RP, 72% Nx) as compared to Canada (39% Cx, 15% RP, 10% Nx) and Japan (8% Cx, 1% RP, 1% Nx); $p < 0.001$ across countries for each procedure. Less variation was present for mechanical prophylaxis, which was most commonly used until ambulation or discharge. Residents were more likely to prescribe pharmacological prophylaxis at discharge compared to attending urologists, odds ratios Cx 2.3 (1.3, 4.0), RP 2.3 (1.1, 4.7), Nx 2.2 (0.9, 4.9) after adjusting for country.

Conclusions: We found very large variation in use of post-discharge pharmacological thromboprophylaxis between countries. This practice

variation mandates action to produce procedure-specific clinical practice guidelines.

MP-05.06

Crowd-sourced assessment of technical skills for validation of basic laparoscopic urological skills (BLUS) tasks

McDougall, Elspeth M.^{1,2}; Kowalewski, Timothy²; Comstock, Bryan²; Sweet, Robert²; Schaffhausen, Cory²; Menhadji, Ashleigh²; Averch, Timothy²; Box, Geoffrey²; Brand, Timothy²; Ferrandino, Michael²; Kaouk, Jihad²; Knudsen, Bodo E.²; Landman, Jaime²; Lee, Benjamin²; Schwartz, Bradley²; Lendvay, Thomas²

¹Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; ²Office of Education, American Urological Association, Linthicum, MD, United States

Introduction and Objectives: The American Urological Association (AUA) sought to pursue a "basic" laparoscopic training and credentialing initiative called Basic Laparoscopic Urological Skills (BLUS) to address both cognitive and technical skills as appropriate to urological laparoscopy. The BLUS consortium sought to address the problem of accurate, scalable, and affordable skill evaluation by investigating the concordance of two novel assessment methods with faculty panel scores: automated motion metrics (EDGE device, Simulab Corp., Seattle WA) and crowdsourcing (C-SATS Inc., Seattle WA).

Methods: A faculty panel of surgeons (n=5) and anonymous crowdworkers blindly reviewed a randomized sequence of a representative sample of videos (n=24, 12 pegboard and 12 suturing) extracted from the BLUS validation study (n=454) using the GOALS survey tool with appended pass/fail anchors via the same web-based user interface. Pre-recorded motion metrics (tool path length, jerk cost, etc.) were available for each video. Cronbach's alpha, Pearson's R, and receiver operator curves (ROC) with area under curve (AUC) statistics were used to evaluate concordance between continuous scores and pass/fail criteria among the three groups: faculty, crowds, and motion metrics.

Results: Crowdworkers provided 1840 ratings in approximately 48 hours, 60 times faster than the faculty panel. The inter-rater reliability of mean expert and crowd ratings was good ($p=0.826$). Crowd-score derived pass/fail resulted in 96.9% AUC (95% CI 90.3-100%; 100%PPV, 89%NPV). Motion metrics and crowd scores provided very similar or nearly identical concordance with faculty panel ratings and pass/fail decisions.

Conclusions: The overall agreement between faculty, motion metrics, and crowdworkers further supports the construct validity of the BLUS tasks. Further investigation of crowdworker assessment of surgeon video-recorded skill proficiency alongside automated motion metrics is warranted.

American Urological Association provided funding for this research

MP-05.07

Setting national standards in basic laparoscopic skills for Canadian urology trainees

Lee, Jason Y.¹; Andonian, Sero²; Pace, Kenneth T.¹; Grober, Ethan D.¹

¹Urology, University of Toronto, Toronto, ON, Canada; ²Urology, McGill University, Montreal, QC, Canada

Introduction and Objectives: As Canadian residency programs move to a competency-based training (CBT) model, iterative assessments against an objective set of standards will be necessary. To develop a valid set of technical skills standards for Canadian urology trainees, we initiated a national skills assessment study focusing initially on basic laparoscopic skills.

Methods: Between February 2014 and October 2015, the basic laparoscopic skills of Canadian urology trainees were assessed. Residents at different stages of training completed four standardized tasks (peg transfer, pattern cutting, suturing and knot-tying, clip applying) from the validated Basic Laparoscopic Urological Skills (BLUS) curriculum. Staff urologists were also tested. All performances were video-recorded. Performances were assessed using two different methods: traditional time plus errors-based (TE) scoring and global rating scores (GOALS) using a novel crowd-sourcing platform (CSATS). Contrasting groups method was used for standard setting.

Table 1. MP-05.07.

Mean task scores	PGY0 (n=47)	PGY3 (n=15)	PGY5 (n=25)	Faculty (n=5)	p value
Peg-transfer					
TE score (max 300)	166.1 ± 58.4	127.0 ± 44.8	100.0 ± 29.4	58.0 ± 6.2	<0.01
GOALS score (max 20)	12.1 ± 2.0	13.3 ± 1.2	13.9 ± 1.9	15.8 ± 1.1	<0.01
Pattern cutting					
TE score (max 300)	292.2 ± 22.8	260.8 ± 69.0	204.1 ± 50.0	103.2 ± 18.3	<0.01
GOALS score (max 20)	10.4 ± 1.5	11.4 ± 1.7	12.8 ± 1.5	14.4 ± 1.0	<0.01
Suturing and knot-tying					
TE score (max 300)	290.6 ± 28.3	176.9 ± 84.1	135.3 ± 37.1	58.5 ± 6.4	<0.01
GOALS score (max 20)	10.6 ± 1.5	13.6 ± 2.0	13.7 ± 1.5	16.5 ± 1.1	<0.01
Clip-applying					
TE score (max 90)	71.0 ± 17.1	64.6 ± 21.1	46.2 ± 16.5	22.8 ± 2.0	<0.01
GOALS score (max 20)	12.8 ± 1.1	13.5 ± 1.4	14.4 ± 2.0	16.5 ± 1.5	<0.01

Table 2. MP-05.07.

	% within 1 SD of faculty peg-transfer task (TE score)	% within 1 SD of faculty Pattern-cut task (TE score)	% within 1 SD of faculty suturing task (TE score)	% within 1 SD of faculty clip-applying task (TE score)
PGY0	8.5%			
PGY3	20.0%			
PGY5	32.4%			

Results: A total of 99 urology trainees (47PGY0, 15 PGY3, 37 PGY5) and six staff urologists completed the testing. Reported clinical lap experience and level of training both correlated with performance scores on all four tasks ($p < 0.01$). Staff performance, using both TE and GOALS scoring methods, was significantly different from any level trainee on all four tasks ($p < 0.05$; Table 1). Reported access to lap skills training tools correlated with trainee performance scores. Using staff urologist scores, various accepted passing scores can be selected for trainees at any level for standard setting purposes (Table 2).

Conclusions: The four validated BLUS tasks demonstrated construct validity evidence for the purpose of assessing the basic laparoscopic skills of Canadian urology trainees. Based on a large cohort of trainees, mean performance scores on these four BLUS tasks have been established at three different levels of training and for faculty urologists, which can now be used to set standards.

This study was funded by CUA Scholarship Fund

MP-05.08

Assessment of endourology simulator use in Canadian training programs

Rasmussen, Andrew¹; Rourke, Keith F.¹

¹Division of Urology, University of Alberta, Edmonton, AB, Canada

Introduction and Objectives: With the dawn of competency-based resident education, there will likely be an emerging need for surgical simulation to fill gaps in resident surgical skill acquisition and evaluation. While there are numerous validated endourology simulators reported, there is a lack of formal data describing their use in Canadian residency training programs. The objective of this study is to describe the use of and attitudes towards endourology simulators in Canada.

Methods: Two web-based surveys were distributed; the first to the Royal College Urology Specialty Committee (RC) and the second to Canadian Urological Association (CUA) general membership (GM). The surveys collected numeric, categorical, and free-text responses. Major themes included demographics, resident simulator usage patterns, attitudes towards simulators, and perceived barriers to their use. Data were analyzed using a mixed methods approach.

Results: 17 participants responded to the RC survey and 67 responded to the GM survey. 85% (11/13) residency programs were represented in the RC survey. 94% of RC participants were academic urologists, while

the GM group was more heterogeneous (52% academic vs. 48% clinical/community-based). 64% of the represented programs reported use of endourology simulators, while 57% of those programs used simulators as part of the formal skills curriculum. Only 6% use simulation regularly (monthly or more) while 12% use simulation for routine evaluation. 82% of RC survey participants and 64% of GM participants agreed that simulators are useful in resident education, particularly in the PGY 1-3 group. Barriers to simulator use were varied, but cost and lack of faculty interest were cited most frequently in both groups.

Conclusions: While numerous barriers to implementation exist and are not used, simulators are used intermittently across Canada and are viewed favourably by most. Both literature and opinion suggest that simulation is most effectively used in the junior resident population.

MP-05.09

Age-stratified perioperative mortality after urological surgeries

Wallace, Brendan¹; Breau, Rodney H.¹; Mallick, Ranjeeta¹; Cnossen, Sonya¹; Cagiannos, Ilias¹; Morash, Christopher G.¹; Lavallee, Luke T.¹

¹Division of Urology, Department of Surgery, University of Ottawa and Ottawa Hospital Research Institute, Ottawa, ON, Canada

Introduction and Objectives: Many elderly patients receive urological surgery. Understanding the risk of death after urological surgery is important for patient selection and counselling.

Methods: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was reviewed from 2006-2014. Current procedural terminology (CPT) codes for similar surgical procedures were grouped for analysis. Commonly performed urological procedures were identified and stratified by patient age and surgical approach (open vs. laparoscopic/robotic). The primary outcome was the absolute risk of death by 30 days stratified by age for each surgical procedure. Secondary outcomes were relative risk of death by age group, death in-hospital vs. after discharge, and risk of death by surgical approach (open vs. laparoscopic/robotic).

Results: 12 urological procedures and 93 719 patients were reviewed. 36% of patients receiving surgery were over age 70 and 12% were over age 80. A total of 765 (0.8%) deaths occurred in patients receiving these procedures by 30 days after surgery. The procedure with the highest incidence of death by 30 days was open nephroureterectomy (3.2%). In patients over 80, the procedure with the highest incidence of death was

Table 1. MP-05.09. Death within 30 days of surgery stratified by age.

Procedure	n	Overall	<50	50-59	60-69	70-79	≥80
Open nephroureterectomy	678	3.2%	1.2%	1.2%	2.5%	5.2%	4.2%
Radical cystectomy with diversion	5994	2.4%	1.1%	1.3%	1.6%	2.8%	4.9%
Percutaneous nephrolithotomy	144	2.1%	0.0%	2.1%	0.0%	*	*
Open radical nephrectomy	5577	1.8%	0.9%	1.2%	1.3%	2.9%	6.0%
TURBT	11 849	1.7%	0.9%	1.1%	0.6%	1.2%	3.5%
Lap nephroureterectomy	1681	1.3%	0.0%	0.9%	1.7%	1.0%	2.2%
TURP	18 494	0.7%	0.0%	0.2%	0.3%	0.5%	1.8%
Lap radical nephrectomy	8534	0.6%	0.0%	0.4%	0.5%	0.7%	2.0%
Open partial nephrectomy	4007	0.6%	0.1%	0.2%	0.5%	1.0%	4.6%
Lap partial nephrectomy	6558	0.3%	0.1%	0.1%	0.2%	0.7%	2.1%
Open radical prostatectomy	6202	0.2%	0.0%	0.1%	0.2%	0.5%	1.1%
Lap/robotic prostatectomy	24 001	0.1%	0.0%	0.1%	0.1%	0.2%	2.4%

Lap: laparoscopic

*Incidences for procedures with less than 20 cases per age group not reported.

open nephrectomy (6.0%). The incidence of death increased by age group for all procedures. The risk of death is consistently increased in patients who receive open compared to laparoscopic surgery.

Conclusions: Knowledge regarding the absolute risk of death in patients receiving common urological surgeries improves patient selection and counselling. As anticipated, the risk of death consistently increases by age group for all urological procedures.

MP-05.10

Impact of a training program on graduating residents' performance on a national preparatory exam for certification in the specialty of urology: Results of the last 13 consecutive years

Touma, Naji J.¹; Beiko, Darren T.¹; Leveridge, Michael J.¹

¹Urology, Queen's University, Kingston, ON, Canada

Introduction and Objectives: The performance of graduating residents on certification exams is likely impacted by many factors. It is unknown, however, whether a training program has any impact on the performance of its graduates on certification exams. We present 13 years of results of a national preparatory exam that all graduating residents complete about three months before the RCPSC exam. The aim of this study is to analyze the impact of a training program on the performance of its residents and identify any trends over time.

Methods: A retrospective review of the exam results from 2003-2015 was conducted. During that time, 378 candidates from all 12 Canadian urology training programs undertook the exam. The performances of graduating residents from each individual program were grouped together for any given year. The different programs were anonymized as the aim of this study is to assess the impact of a training program and not to rate the different programs. Statistical analysis using one-way ANOVA was conducted.

Results: The means for the written component, oral component, and overall score are 73.79%, 74.16%, and 73.97% respectively. All training programs fall within one standard deviation from the mean for the written component, the oral component, and the overall score. The residents of four training programs had statistically better scores than the overall mean of the written component. The residents of three out of these four training programs also had statistically better scores than the overall mean of the oral component and the overall results of the exam. No training program produced mean exam scores that are statistically worse than the overall mean in any component of the exam or in the overall score.

Conclusions: Most Canadian training programs prepare their residents adequately for the certification exam in urology. However, there are some training programs that consistently prepare graduating residents to outperform their peers.

MP-05.11

Series of systematic reviews and meta-analyses of the risk of thrombosis and bleeding in urological cancer surgery (ROTBUS Cancer)

Violette, Philippe D.¹; Craigie, Samantha^{2,3}; Agarwal, Arnav^{2,4}; Novara, Giacomo⁵; Cartwright, Rufus^{6,7}; Naspro, Richard⁸; Siemieniuk, Reed A.⁹; Gould, Michael K.¹⁰; Sandset, Per Morten^{11,12}; Guyatt, Gordon H.^{2,13}; Tikkinen, Kari A.O.^{14,15}

¹Department of Surgery, Division of Urology, University of Western Ontario, London, ON, Canada; ²Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada; ³Michael G. DeGroote Institute for Pain Research and Care, McMaster University, Hamilton, ON, Canada; ⁴School of Medicine, University of Toronto, Toronto, ON, Canada; ⁵Department of Surgical, Oncological, and Gastroenterological Sciences, Urology Clinic, University of Padua, Padua, Italy; ⁶Department of Epidemiology and Biostatistics, Imperial College London, London, United Kingdom; ⁷Department of Urogynecology, St. Mary's Hospital, London, United Kingdom; ⁸Department of Urology, AO Papa Giovanni XXIII, Bergamo, Italy; ⁹Department of Medicine, University of Toronto, Toronto, ON, Canada; ¹⁰Department of Research and Evaluation, Kaiser Permanente Southern California, Pasadena, CA, United States; ¹¹Department of Hematology, Oslo University Hospital, Oslo, Norway; ¹²Institute of Clinical Medicine, University of Oslo, Oslo, Norway; ¹³Department of Medicine, McMaster University, Hamilton, ON, Canada; ¹⁴Department of Urology, Helsinki University Central Hospital and University of Helsinki, Helsinki, Finland; ¹⁵Department of Public Health, University of Helsinki, Helsinki, Finland

Introduction and Objectives: Pharmacological thromboprophylaxis involves trading off reduction in venous thromboembolism (VTE) against increased bleeding. Here, we provide best estimates of absolute risk of VTE and bleeding in urological cancer surgery.

Methods: We searched for contemporary observational studies reporting symptomatic VTE or bleeding after urological procedures. For each procedure, we accounted for use of thromboprophylaxis and length of followup, and derived best estimates from the median of included studies. Primary endpoints were four-week postoperative incidence of symptomatic VTE and bleeding requiring re-operation. We stratified on patient risk factors for VTE (body mass index (BMI) >35, age >75, personal or family history). Quality of evidence was assessed using GRADE.

Results: We included 64 studies reporting on 13 urological cancer procedures, including different approaches of cystectomy, prostatectomy, and nephrectomy. Quality of evidence was moderate for prostatectomy and cystectomy and low or very low for renal procedures. Risk of VTE varied widely between procedures, and between approaches within the same procedure. Cystectomies were high risk for VTE (rang 2.9-13.9%), but low-risk for bleeding (0.3%). Risks of VTE in prostatectomies showed

substantial variation depending on patient risk factors and use of pelvic lymph nodes dissection (PLND) (0.2-15.7%), with bleeding risks from 0.2-0.4%. VTE risks in renal cancer surgeries were 0.7-6.2% across patient risk groups, with bleeding risks of 0.1-1.7%.

Conclusions: Our results suggest that extended thromboprophylaxis is clearly warranted in some procedures. For those operations where the tradeoff is less clear, the decision will depend on surgeon and patient values and preferences with regard to VTE and bleeding.

UP-05.01

The effect of an automated appointment reminder service on non-attendance rates in a high-volume urology centre

Wright, Ian T.S.¹; Crump, Trafford¹; Baverstock, Richard J.¹

¹Urology, University of Calgary, Calgary, AB, Canada

Introduction and Objectives: Non-attendance reduces the efficiency of healthcare delivery, increasing the length of wait lists and costs. Automated appointment reminder services (AARS) are an alternative to live telephone reminders. Here we examine the effect of an AARS on non-attendance rates for outpatient procedure and clinic appointments at a high-volume urology centre.

Methods: An AARS was implemented at our high-volume urology centre on August 1, 2015. Patients were contacted by telephone one week prior to scheduled appointment with an automated reminder of the appointment date and time and an option to confirm or cancel the appointment via numerical selection. Electronic medical record data was retrospectively reviewed for outpatient office and ambulatory cystoscopy appointments before and after implementation. AARS call status, patient age, sex, referral diagnosis, visit type, and time from last encounter to appointment date were collected. Non-attendance was defined as the patient cancelling the visit <24 hours prior to time of appointment or not arriving for the appointment. Data was compared to determine the effectiveness of the AARS on reducing non-attendance rates.

Results: 460 patient charts were reviewed; 228 prior to and 242 after the implementation of the AARS. Of the 242 patients evaluated after implementation of the AARS, 130 were successfully contacted. The non-attendance rate for patients contacted by the AARS was 10.7% compared to 7.6% for those not notified by the AARS ($p=0.27$). Patient age, sex, referring diagnosis, visit type, and time from last encounter to appointment date were balanced between non-attendees and attendees. One patient cancelled his/her appointment via the AARS.

Conclusions: The use of an AARS made no difference to the non-attendance rates for outpatient office and cystoscopy appointments. In our real-world experience with this AARS, only 54% of the patients scheduled for appointments were contacted successfully.

UP-05.02

Longitudinal results of a national preparatory exam for certification in the specialty of urology: Strengths and weaknesses of graduating residents over the last 13 years

Touma, Naji J.¹; Beiko, Darren T.¹; Leveridge, Michael J.¹

¹Department of Urology, Queen's University, Kingston, ON, Canada

Introduction and Objectives: Certification by the Royal College of Physicians and Surgeons of Canada (RCPSC) into the specialty of urology requires the completion of a five-year residency at an accredited institution and the successful sitting of a comprehensive exam at the end of residency. The content and the results of this certifying exam are not disclosed beyond a pass or fail result. We present 13 years of results of a national preparatory exam that all graduating residents complete about three months before the RCPSC exam. This exam, known colloquially as QUEST, aims to simulate the RCPSC exam with written and oral components. The aim of the study was to assess the level of knowledge of graduating urology residents and whether any gaps can be identified in any aspect of urological training.

Methods: A retrospective review of the exam results from 2003-2015 was conducted. During that time, 378 candidates from all 12 Canadian urology training programs undertook the exam. The exam contents were divided into 10 different topics to ascertain differences in knowledge. The

broad categories included oncology, pediatrics, endourology, andrology, female urology, benign conditions, communication, urodynamics, imaging, and visual recognition. Statistical analysis using one-way ANOVA was conducted.

Results: There is a direct linear correlation between performance on the written and the oral components of the exam. Candidates perform equally well on topics related to oncology (mean=76.8%), pediatrics (mean=79.5%), endourology (mean=76.2%), andrology (mean=78.6%), female urology (mean=78.2%), benign conditions (mean=78.7%), and communication (mean=75.6%). However, components of the exam related to interpretation of urodynamics (mean=63.4%), imaging (mean=67.1%), and visual recognition (mean=65.8%) seem to result in lower marks.

Conclusions: Graduating residents seem to underperform on interpretative components of a preparatory exam for certification. Those components include urodynamics, imaging, and visual recognition.

UP-05.03

Using a web-based decision support program to facilitate urological treatment discussions with men newly diagnosed with prostate cancer

Davison, Barbara¹; Szafron, Michael²; Visvanathan, Kishore³; Andkhoie, Mustafa²

¹College of Nursing, University of Saskatchewan, Saskatoon, SK, Canada;

²School of Public Health, University of Saskatchewan, Saskatoon, SK, Canada;

³Division of Urology, University of Saskatchewan, Saskatoon, SK, Canada

Introduction and Objectives: To measure the impact of using a web-based decision support technology, the Decision Support Intervention-Prostate Cancer (DSI-PC), to facilitate treatment consultations of men newly diagnosed with prostate cancer (PC).

Methods: Health information seeking behaviour, factors having an influence on the treatment decision, decision control, and preferred treatment prior to making a treatment decision were recorded by the DSI-PC program. A summary page of responses was provided to patients to use at treatment discussions. Measures of decision control and decision conflict were measured prior to the medical treatment consultation and following a treatment decision. Patient satisfaction was measured after a treatment decision had been made.

Results: 49 men completed the DSI-PC program prior to their treatment consultation. 61% of patients shared the summary sheet with a physician who was involved in their care and 47% discussed the summary sheet with a nurse educator. Impact of treatment on survival was the main factor having an influence on treatment choice. Levels of decisional conflict were significantly lower ($p<0.001$) following the treatment decision, and men reported assuming a significantly more active role in treatment decision-making (TDM) ($p=0.038$) compared to initial assessment. Patients reported high levels of satisfaction with their involvement in medical decision-making and the information they received to participate in TDM.

Conclusions: Results suggest the DSI-PC intervention provides a unique way for urologists and other healthcare professionals to tailor the type and amount of information patients need to make an informed treatment decision.

UP-05.04

An investigation of the quality of radical and partial nephrectomy educational videos on YouTube

Singh, Jas¹; Patel, Premal¹; McGregor, Thomas B.¹

¹Section of Urology, University of Manitoba, College of Medicine, Winnipeg, MB, Canada

Introduction and Objectives: The Internet is a widely available source of health information for clinicians and patients. Many patients preparing to undergo surgery often look to the Internet for information.¹ YouTube is a popular source for videos and is, therefore, a common starting place for patients. The aim of this study is to assess the quality of videos on YouTube relating to radical and partial nephrectomy.

Methods: A search was performed on the website YouTube, which included the search terms, "laparoscopic radical nephrectomy" (LRN), "laparoscopic

partial nephrectomy”(LPN), “open radical nephrectomy”(ORN), and “open partial nephrectomy”(OPN). The first 50 videos were reviewed and included if they did not meet exclusion criteria, such as non-English language, non-human animal, specific surgical technique, interviews, academic presentations, hand/robotic assistance. Videos were independently reviewed by two urologists and two urology residents. In total, 69 videos met inclusion and five were chosen randomly from each category and reviewed. All videos were evaluated using a five-point Likert scale with a score of 1 indicating poor quality and 5 indicating excellent quality. Videos were assessed based on surgical demonstration, patient applicability, surgical outcomes, and overall assessment.

Results: The LRN, LPN, ORN, and OPN, mean scores for surgical demonstration were 3.2, 2.65, 3.02, and 3.58, respectively. For patient applicability, they were 1.87, 2.00, 1.47, and 3.00, respectively; and for surgical outcomes, they were 1.23, 1.00, 1.00, and 1.70, respectively. The overall assessment scores were 2.8, 2.53, 1.3, and 2.45, respectively. A direct comparison between resident and urologist scores did not appear to demonstrate a statistically significant difference ($p=0.949$).

Conclusions: The quality of educational videos involving radical and partial nephrectomy on YouTube is quite variable. While a number of high-quality videos exist, there is poor consistency and the majority of content is either poorly demonstrated or highly uninformative.

1. McMullan M. Patients using the Internet to obtain health information: How this affects the patient–health professional relationship. *Patient Educ Couns* 2006;63:24-8. <http://dx.doi.org/10.1016/j.pec.2005.10.006>

UP-05.05

The landscape of systematic reviews in urology (1998-2015): An assessment of methodological quality

Gandhi, Shreyas¹; Han, Julia²; Bockoven, Crystal³; Dahm, Philipp⁴

¹Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada; ²Department of Urology, University of Florida, Gainesville, FL, United States; ³University of Minnesota Medical School, Minneapolis, MN, United States; ⁴Department of Urology & Minneapolis VA Health Care System, University of Minnesota, Minneapolis, MN, United States

Introduction and Objectives: High-quality systematic reviews (SRs) have a paramount role in informing evidence-based clinical practice. We assessed the quality of published systematic reviews in the urological literature as an extension of a prior study.¹

Methods: We systematically searched PubMed and hand-searched the table of contents of four major urological journals from 1/2013 to 12/2015 to identify SRs related to questions of prevention and therapy. Two independent reviewers assessed the methodological quality using the 11-point Assessment of Multiple Systematic Reviews (AMSTAR) instrument. We performed protocol-driven analyses for the 2013-2015 time period alone and in aggregate with earlier data for the 1998-2012 time period.

Results: The updated literature search identified 490 studies, of which 130 ultimately met inclusion criteria. The most common SR topic for 2013-2015 was oncology (68; 52.3%), followed by voiding dysfunction (28; 21.5%) and stones/endourology (10; 7.7%). The mean AMSTAR scores \pm SD for 2013-2015 ($n=130$), 2009-2012 ($n=113$), and 1998-2008 ($n=57$) were 4.9 ± 2.4 , 5.4 ± 2.3 , and 4.8 ± 2.5 , respectively ($p=0.160$). In 2013-2015, AMSTAR scores for *BJU International* ($n=29$), *The Journal of Urology* ($n=19$), *European Urology* ($n=62$), and *Urology* ($n=20$) were 5.6 ± 3.1 , 5.1 ± 2.6 , 4.6 ± 2.3 , and 4.3 ± 2.3 , respectively ($p=0.205$). SRs scored highest for the description of studies' baseline characteristics (118; 90.8%) and comprehensive literature search of two or more databases (105; 80.8%). They scored lowest on conflict of interest reporting (6; 4.6%) and the inclusion of unpublished studies to avoid publication bias (10; 7.7%).

Conclusions: There has been an exponential increase in the number of systematic reviews published in the urological literature year by year, but a stagnation of methodological quality. Systematic review authors and editors should apply established methodological standards to enhance the validity and impact of systematic reviews.

1. MacDonald SL, Canfield SE, Fesperman SF, et al. Assessment of the methodological quality of systematic reviews published in the urological literature from 1998 to 2008. *J Urol* 2010;184:648-53. <http://dx.doi.org/10.1016/j.juro.2010.03.127>

UP-05.06

Series of systematic reviews and meta-analyses of the risk of thrombosis and bleeding in urological non-cancer surgery (ROTBUS non-cancer)

Violette, Philippe D.¹; Craigie, Samantha^{2,3}; Agarwal, Arnav^{2,4}; Cartwright, Rufus^{5,6}; Siemieniuk, Reed A.⁷; Novara, Giacomo⁸; Naspro, Richard⁹; Sandset, Per Morten^{10,11}; Gould, Michael K.¹²; Guyatt, Gordon H.^{2,13}; Tikkinen, Kari A.O.^{14,15}

¹Department of Surgery, Division of Urology, University of Western Ontario, London, ON, Canada; ²Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON, Canada; ³Michael G. DeGroote Institute for Pain Research and Care, McMaster University, Hamilton, ON, Canada; ⁴School of Medicine, University of Toronto, Toronto, ON, Canada; ⁵Department of Urogynecology, St. Mary's Hospital, London, United Kingdom; ⁶Department of Epidemiology and Biostatistics, Imperial College London, London, United Kingdom; ⁷Department of Medicine, University of Toronto, Toronto, ON, Canada; ⁸Department of Surgical, Oncological, and Gastroenterological Sciences, Urology Clinic, University of Padua, Padua, Italy; ⁹Department of Urology, AO Papa Giovanni XXIII, Bergamo, Italy; ¹⁰Department of Haematology, Oslo University Hospital, Oslo, Norway; ¹¹Institute of Clinical Medicine, University of Oslo, Oslo, Norway; ¹²Department of Research and Evaluation, Kaiser Permanente Southern California, Pasadena, CA, United States; ¹³Department of Medicine, McMaster University, Hamilton, ON, Canada; ¹⁴Department of Urology, Helsinki University Central Hospital and University of Helsinki, Helsinki, Finland; ¹⁵ Department of Public Health, University of Helsinki, Helsinki, Finland

Introduction and Objectives: Pharmacological thromboprophylaxis involves trading off reduction in venous thromboembolism (VTE) against increased bleeding. Here, we provide best estimates of absolute risk of VTE and bleeding in urological non-cancer surgery.

Methods: We searched for contemporary observational studies reporting symptomatic VTE or bleeding after urological procedures. For each procedure, we accounted for use of thromboprophylaxis and length of followup, and derived best estimates of risk from the median of included studies. Primary endpoints were four-week postoperative incidence of symptomatic VTE and bleeding requiring reoperation. We stratified on patient risk factors for VTE (body mass index (BMI) >35 , age >75 , personal or family history). Quality of evidence was assessed using GRADE.

Results: We included 35 studies reporting on 7 urological procedures for benign disease. Most studies (55%) were at high-risk of bias due to lack of thromboprophylaxis reporting; quality was low or very low for each body of evidence. When prophylaxis was reported, duration varied widely between procedures and studies; e.g., median was five days (range 4-42) for laparoscopic donor kidney transplantation and one day (range 0-1) for reconstructive female pelvic surgery (including vaginal prolapse and sling surgery). Risk of VTE and bleeding were both generally low for these procedures ($<2\%$). The highest risks were found in open recipient nephrectomy and open prolapse surgery.

Conclusions: Our results suggest prophylaxis is warranted in some procedures (kidney transplantation in large-risk patients) and not others (reconstructive female pelvic surgery in small/medium-risk patients). For those operations where the tradeoff is less clear, the decision will depend on surgeon and patient values and preferences with regard to VTE and bleeding.

Table 1. UP-05.06. Risk (%) of VTE and bleeding requiring reoperation at 4 weeks after urological non-cancer surgery

Procedure	Outcome	Estimate by patient risk strata (%)	
Donor, nephrectomy, laparoscopic	VTE	Small risk	0.4
		Medium risk	0.7
		Large risk	1.4
	Bleeding requiring reoperation		0.1
Donor nephrectomy, open	VTE	Small risk	0.3
		Medium risk	0.7
		Large risk	1.3
	Bleeding requiring reoperation		0.1
Recipient nephrectomy, open	VTE	Small risk	1.8
		Medium risk	3.7
		Large risk	7.4
	Bleeding requiring reoperation		2.4
Percutaneous nephrolithotomy	VTE	Small risk	0.4
		Medium risk	0.7
		Large risk	1.5
	Bleeding requiring reoperation		0.5
TURP or equivalent	VTE	Small risk	0.2
		Medium risk	0.4
		Large risk	0.8
	Bleeding requiring reoperation		0.2
Prolapse surgery (open)	VTE	Small risk	0.7
		Medium risk	1/3
		Large risk	2.6
	Bleeding requiring reoperation		0.4
Reconstructive female pelvic surgery	VTE	Small risk	0.2
		Medium risk	0.3
		Large risk	0.7
	Bleeding requiring reoperation		0.3

UP-05.07**Improving access to urologists through an electronic consultation service**

Witherspoon, Luke¹; Mahoney, John E.¹; Keely, Erin^{2,3}; Liddy, Clare^{4,5}; Afkham, Amir⁶

¹Urology, The Ottawa Hospital, Ottawa, ON, Canada; ²Endocrinology/Metabolism, The Ottawa Hospital, Ottawa, ON, Canada; ³Medicine, University of Ottawa, Ottawa, ON, Canada; ⁴Family Medicine, The Ottawa Hospital, Ottawa, ON, Canada; ⁵Bruyere Research Institute, Brueyere Hospital, Ottawa, ON, Canada; ⁶Champlain Local Health Integration Network, Champlain Local Health Integration Network, Ottawa, ON, Canada

Introduction and Objectives: Access to specialist services is limited by wait times to see these physicians and geographic availability of these specialists. An e-consult service, Champlain BASE (Building Access to Specialist Advice), has been implemented in our service region, facilitating access to specialists by primary care providers (PCP). Through a secure web-based system, PCPs are able to send e-referrals, instead of requesting a formal in-office referral. We analyzed the characteristics of the referred cases and the service's impact on improving access to urologists.

Methods: 190 e-consults completed through the Champlain BASE service from March 2013 to January 2015 were analyzed. Each consult was characterized in regards to the question asked by the referring physician, the primary symptom of the referred patient, and any diagnosis made. Based on the mandatory end of case survey, we analyzed rates of referral avoidance, physician satisfaction, and overall impact on patient care.

Results: Of 190 e-consultations, 70% were completed in less than 10 minutes. The most common clinical questions related to interpretation of imaging reports (16%), tests to choose for investigating a condition (15%), interpretation of clinical findings (14%), and the indications for urological procedures (13%). Common diagnoses were hematuria (13%), renal mass (8%), kidney stones (7%), and recurrent urinary tract infections (6%). In 35% of cases, a referral to a urologist had been contemplated and was avoided. In 8% of cases, a PCP did not believe a consultation was initially needed, but a referral ultimately was sent after the e-consultation.

Conclusions: Our study shows that although certain clinical presentations still require a formal in-person urological consultation, e-consultations can potentially reduce unnecessary clinic visits, while identifying patients who may benefit from early urological consultation. Through both these mechanisms, we may improve timely access to urologists.