Poster Session 5: Training, Education, AI
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MP 5.1
Flexible ureteroscopy skill development using motion-tracking simulation with ureteroscope tip tracking

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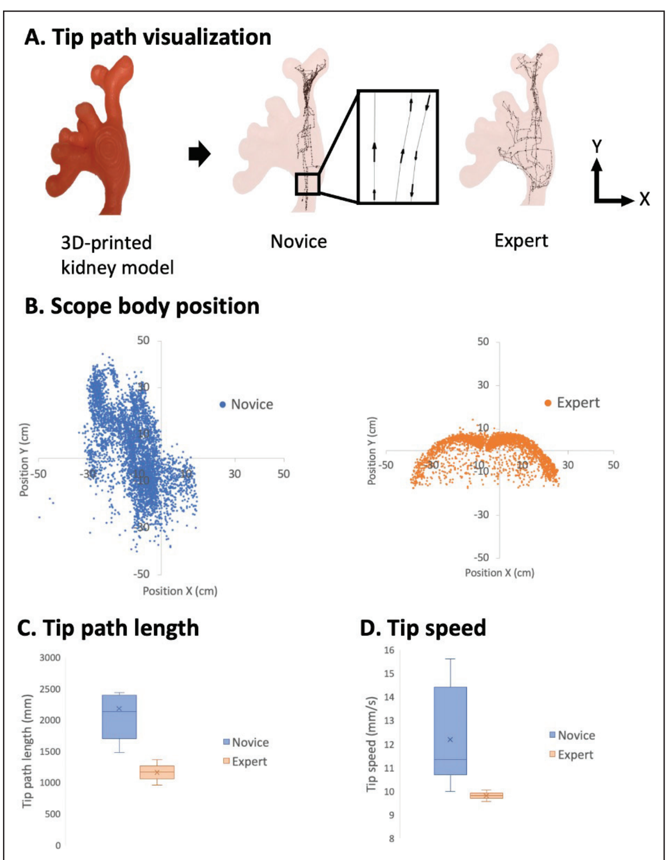
Introduction: Instrument motion tracking in surgical simulation is beneficial as a teaching and evaluation tool. Recently, our group developed a synchronized motion-tracking simulation system for flexible ureteroscopy (fURS). This study aimed to compare kinematic parameters between novices and experts during fURS simulation.

Methods: Our system consisted of a 3D-printed kidney model within a URS simulation box. Motion tracking sensors were attached to the scope's body and the distal tip of a ureteroscope. The body sensor tracked the surgeon's movement while the tip sensor tracked the location and intrarenal movement of the scope tip. A potentiometer was attached to the control lever to measure deflection, tracked as a percentage of maximum. The task was to map the kidney by traversing all its calyxes.

Results: We recruited 10 participants, six PGY2s and two PGY3s (novices), and two endourology fellows (experts). The mean URS score was 10 for novices and 16 for experts (p=0.04). The mean path length for the intrarenal tip was 2182±613 mm for novices and 1164±290 mm for experts (p=0.03), while its mean speed was 12.2±2.1mm/s and 9.8±0.3 mm/s respectively (p=0.01). Visualizing the tip path showed that novices traversed less renal area, especially for lateral calyxes (Figure 1A). Visualizing scope body movement showed that experts moved in a predictable wing-shaped pattern, while novices moved relatively randomly (Figure 1B). The average lever deflection magnitude was 5.7±2.4% for novices compared to 10.8±0.67% for experts (p=0.001).

Conclusions: This is the first study that incorporated intrarenal tip tracking during fURS motion analysis. Our findings set the stage for adaptive and personalized learning, as novices have access to timely feedback and can understand the visual differences in tip path and scope body movement by comparing them to experts' results. Our preliminary findings emphasize that experts show limited yet predictable scope body movement, greater lever deflection, and effective tip movement.



MP 5.1. Figure 1.

MP 5.2
The association of learning styles with exam performance in graduating Canadian urology residents

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Introduction: The Kolb learning theory attributes differences in the way people learn with the way they perceive and process an experience. A learning style inventory in the form of the validated Kolb's Experiential Learning Profile (KELP) has been studied in other surgical disciplines. Identifying the learning style of urology residents may help in the development of teaching curricula that are best suited to knowledge and skill acquisition. The objective of this study was to both characterize the learning styles of graduating Canadian urology residents and correlate individual styles with exam performance.

Methods: The KELP was administered to all graduating Canadian urology residents attending a mock exam meant to simulate their upcoming board exams for three consecutive years (2021–2023). Project participation was 100%. All participants received a report at the conclusion of the course. Participants' preferred learning phase (acting, thinking, reflecting, experiencing) and a specific learning style (deciding, analyzing, thinking, acting, initiating, balancing, reflecting, experiencing, imagining) were identified for all residents. Individual exam performance was recorded for both written and OSCE components. Cumulative, OSCE, and written scores were analyzed between the learning phase and learning style, respectively (mean percentile score ± SD; one-way ANOVA, Tukey's multiple comparisons test, α=0.05).

Results: Graduates from 2021 (n=35), 2022 (n=29), and 2023 (n=37) were included. In aggregate, the most common preferred learning phases were "acting" (38/101, 37.6%), "thinking" (35/101, 34.7%), "reflecting" (19/64, 18.8%), and "experiencing" (9/101, 9.1%). In aggregate, the most common preferred learning styles were "deciding" (19/101, 18.8%), "acting" (15/101, 14.9%), "analyzing", "initiating" and "thinking" (14/101, 13.9%, each), "reflecting" (8/101, 7.9%), "experiencing" (3/101, 3%), and "imagining" (2/101, 1.9%). There was no significant difference between the preferred learning phase and oral, written, or total exam performance (p>0.05). Graduates with the "acting" (69.72%±4.25 SD) learning style performed significantly better than the "analyzing" (59.33%±10.67 SD) learning style in the OSCE com-

ponent (p=0.02). There was no difference between learning styles and written or overall scores (p>0.05).
Conclusions: Graduating Canadian urology residents vary in their preferred learning styles but the majority seem to learn by acting and thinking. There was evidence of better oral exam performance between a hands-on learning style compared to an analytic one, however, increased test numbers may better elucidate the strength and relevance of this relationship. This lays the groundwork for future studies correlating learning style to exam performance and surgical skill acquisition.

MP 5.3

Artificial intelligence as a discriminator of competence in urologic training: Are we there?

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Introduction: Assessments in medical education play a central role in evaluating trainees' progress and eventual competence. Generative artificial intelligence (AI) is finding an increasing role in clinical care and medical education. The objective of this study was to evaluate the ability of CHATGPT to generate exam questions that are discriminating in the evaluation of graduating urology residents.
Methods: Graduating urology residents representing all Canadian training programs gather yearly for a mock exam that simulates their upcoming board-certifying exam. The exam consists of a written multiple-choice question (MCQ) exam and an oral OSCE. In 2023, CHATGPT version 4 was used to generate 20 MCQs that were added to the written component. CHATGPT was asked to use Campbell's Walsh, AUA, and CUA guidelines as resources. Psychometric analysis of the CHATGPT MCQs was conducted. The MCQs were also researched by three faculties for face validity and to ascertain if they came from a valid source.
Results: The mean score of the 35 exam-takers on the CHATGPT MCQs was 60.7% vs. 61.1% for the overall exam. A quarter (25%) of CHATGPT MCQs showed a discriminating index >0.3, the threshold for questions that properly discriminate between high and low exam performers; 25% of CHATGPT MCQs showed a point biserial >0.2, which is considered a high correlation with overall performance on the exam. The assessment by faculties found that CHATGPT MCQs often provided incomplete information in the stem, provided multiple potentially right answers, and were sometimes not rooted in the literature. Thirty-five percent of the MCQs generated by CHATGPT provided wrong answers to stems.
Conclusions: Despite what appears to be similar performance on CHATGPT MCQs and the overall exam, CHATGPT MCQs tend not to be highly discriminating. Poorly phrased questions with potential for AI hallucinations are ever present. Careful vetting for quality of CHATGPT questions should be undertaken before their use on assessments in urology training exams.
Acknowledgements: QUEST is funded by an unrestricted education grant from the CUA

MP 5.4

Is AI seeing what I'm seeing? Validation of the Touch Surgery™ Enterprise Platform in calculating operative phases during robotic-assisted partial nephrectomy

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Introduction: The use of surgical video analysis for coaching and performance review in robotic surgery is hindered by a lack of standardization, scalability, and human resources. Touch SurgeryTM Enterprise (TSE) is an AI-powered surgical video and analytics platform that may provide a solution. We sought to validate the ability of TSE to recognize the distinct operative phases of robotic-assisted partial nephrectomy (RAPNx).
Methods: We conducted a retrospective review of all RAPNx performed at the University Health Network between December 2019 and December 2023 with complete video recordings. Once uploaded to the TSE, RAPNx videos were processed and annotated by the proprietary AI algorithm, providing the user with detailed analytics on procedural phases (for example, colon mobilization, hilar clamping, tumor resection, renorrhaphy, etc.) and operative times. The TSE computed analytics were then compared to procedural data obtained via manual review of surgical videos (reference standard).
Results: A total of 52 cases encompassing 54 tumors were included: 41 daVinci and 11 HUGOTM RAS. The mean age was 53.8 years, 65.4% were male, and 61.5% of tumors were left-sided, with the majority staged pT1a (82%). The TSE correctly labeled all phases of the procedure in 82.7% of cases; no cases had >2 phases incorrectly annotated. The TSE made a clinically relevant error in phase annotation in 11.4% of cases, the majority related to vascular clamp removal. The mean actual warm ischemia time (WIT) was 20.3 minutes. The TSE computed WIT and dictated WIT in the operative note was within 60 seconds of actual WIT in 85.7% and 65.7% of cases, respectively. The mean difference from actual WIT was 56.5 seconds for TSE WIT and 94.7 seconds for dictated WIT.
Conclusions: Our study demonstrated that the TSE AI algorithm can accurately recognize phases of RAPNx and is able to calculate WIT more accurately than dictated times on two RAS platforms. Our group aims to validate whether this algorithm can be accurately applied to assess other urologic surgeries.

MP 5.5

Analyzing a decade of graduate opinion on training and self-reported outcomes in the society of genitourinary reconstructive surgeons fellowship match

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Introduction: Beginning in 2012, the Society of Genitourinary Reconstructive Surgeons (GURS) developed a centralized fellowship match, which has grown from 14 to 30 verified programs. The objective of this study was to assess fellow opinion on training and self-reported outcomes of the GURS fellowship match.
Methods: A web-based survey was sent to all GURS graduates from 2012–2022. The survey was composed of 37 questions evaluating the interview process, self-reported competency, surgical experience, academic exposure, employment opportunities, and current practice. The survey was created and analyzed using SurveyMonkey®.
Results: Of 178 GURS fellows graduating from 2012–2022, the response rate was 55% (97/178); 77.3% of respondents identified as male and 20.6% as female. The overall training satisfaction was 95.9%, which did not differ by gender (female 100% vs. male 94.7%, p=0.54) or year of training (2012–2018, 93.2% vs. 2019–2022, 98.1%, p=0.22). Most (97.9%) graduates felt competent to enter unsupervised reconstructive urology practice after completion of fellowship training, which did not differ by gender (female, 100% vs. male, 97.3%, p=0.74) or year (2012–2018, 97.7% vs. 2019–2022, 98.1%, p=0.90). With respect to specific surgical competencies, self-reported competence was 99.0%, 93.8%, 84.5%, 84.4%, and 70.1% for urethral reconstruction, male incontinence surgery, genital reconstruction, male sexual health surgery, and urinary diversion/ureteral reconstruction, respectively. A total of 23.7% felt competent in female pelvic floor surgery; 94.8% reported an understanding of the reconstructive urology literature; and 85.4% participated in sufficient academic activity. Most (93.8%) currently consider themselves gainfully employed as a reconstructive urologist, which did not differ by gender (female, 95.0% vs. male, 93.3%, p=0.90) or year (2012–2018, 88.6% vs. 2019–2022. 98.1%. p=0.09). A majority (66.7%) of graduates are in academic practice, 67.7% are the sole reconstructive urologist in their practice, and 89.7% endorsed working in one of their top three geographic locations. Almost half (49.5%) described a different case mix in practice compared to fellowship and when different related primarily to abdominal reconstruction (44.9%) or genital reconstruction (16.3%). A total of 85.4% describe a satisfactory surgical volume of reconstructive urology cases and 87.5% of graduates' report being satisfied with their job as a reconstructive urologist, which did not differ by gender (female, 90.0% vs. male, 86.7%, p=0.80) or year of training (2012–2018, 84.4% vs. 2019–2022, 90.6%, p=0.22).
Conclusions: GURS graduates report high rates of satisfaction, self-reported competence, gainful employment, and job satisfaction upon completion of training irrespective of gender or year. The growth and diversity of fellowship training appears to mirror the overall growth of the discipline.

MP 5.6

Academic "bookending": A planning method to improve scholarly productivity among urologic learners

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Introduction: Research among urologic learners is often either a requirement of training or encouraged as a means to enhance scholarly skills and distinguish oneself during various application processes. While research infrastructure and opportunity vary among training programs, the exact forum and methods to optimize research productivity remain unknown. Dedicated departmental research days can act as a forum to present research regionally and manuscript prizes may encourage subsequent publication. The purpose of this study was to examine the impact of academic "bookending" with a dedicated research day at the beginning and a manuscript prize at the end of the academic year.

Methods: In 2011, a dedicated urologic research day was initiated at the beginning of the academic year (Sept/Oct) as a forum to present learner research activity. Prior to this, research was presented on a volunteer basis at a regional meeting later in the year. Concurrently, a manuscript prize was initiated near the end of the academic year (May/June). Data on learner presentations were collected from 2005–2022. Duplicate presentations and research proposals were excluded from analysis. Abstract presentation rates at national and international meetings were determined by reviewing published abstracts at major national and international urologic meetings. Publication rates were determined by author and keyword searches of PubMed and Scopus from 2005–2023. Chi-squared analysis was used to examine publication rates before and after initiation of academic year "bookending." Binary logistic regression was used to examine factors associated with publication.

Results: A total of 307 unique research presentations were identified from 2005–2022. The most common presentation topics included urologic oncology (n=84/307, 27.4%), reconstructive urology (n=71, 24.1%), and endourology (n=49, 16.0%). The overall abstract presentation rare at either national or international meetings was 70.3% (200/283). This increased significantly after the institution of academic "bookending" (57.1% vs. 76.4%, p=0.002). The overall manuscript publication rate was 38.2% (108/283). This also increased after the initiation of academic "bookending" (20.2% vs. 45.7%; p≤0.001). On Chi-squared analysis, the likelihood of publication was also associated with topic (p≤0.001) and senior author (p≤0.001); however, on multivariable binary logistic regression, initiation of "bookending" was independently associated with an increased rate of publication (odds ratio 3.8, 95% CI 1.7–8.5, p=0.001) irrespective of author (p=0.004) or topic (p≤0.001). The most common publishing destinations were the Canadian Urological Association Journal (n=33), the Journal of Urology (n=20), and Urology (n=17).

Conclusions: "Bookending" of the academic year with a dedicated research day and manuscript prize enhances academic productivity among learners, as evidenced by higher rates of national/international presentations and manuscript publication in urologic journals. This increase occurs independently of author or topic and may be a simple yet effective means to optimize learner academic productivity.

Acknowledgements: The authors would like to thank all staff and research assistants in the University of Alberta's Department of Urology

MP 5.7

The future of surgical predictions: Evaluating machine-learning algorithms for post-HoLEP Qmax outcomes

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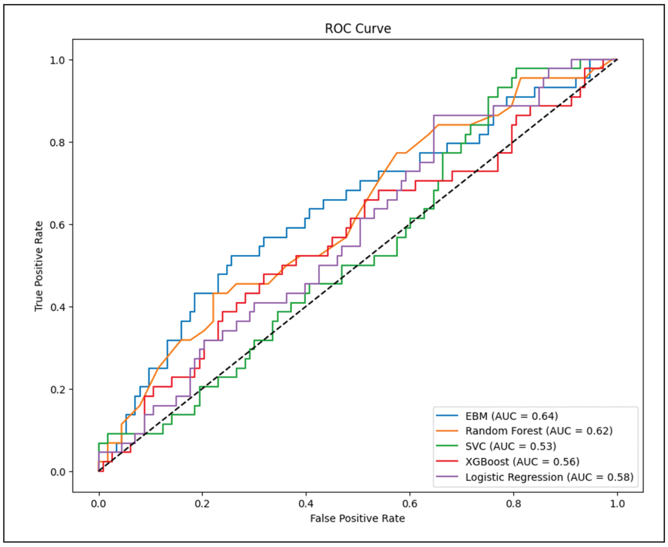
Introduction: Holmium enucleation of the prostate (HoLEP) has rapidly gained prominence over the last decades as one of the surgical choices for benign prostate enlargement (BPE) thanks to its durable outcomes, low reoperation rates, and superior bleeding profile; however, predicting relevant postoperative outcomes, such as maximum flow rate (Qmax), remains a challenge in the literature. This study is the first and largest to compare the effectiveness of various machine-learning models in predicting patients with suboptimal Qmax at one month post-HoLEP (<15 cc/second).

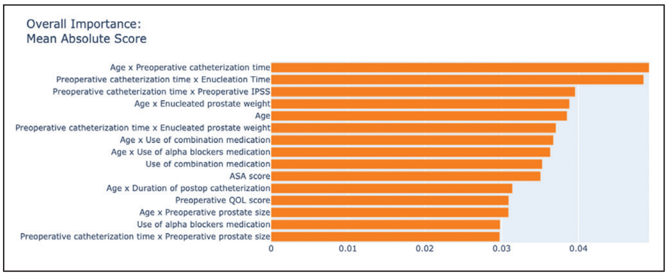
Methods: A retrospective review of patients who underwent HoLEP at our institution between January 2006 and December 2022 was conducted. The dataset contains a comprehensive collection of 30 preoperative and postoperative patient metrics. Multiple imputation by chained equations was used for missing data. Machine-learning models, including explainable boosting machine (EBM), XGBoost (XGB), support vector classification (SVC), random forest (RF), and logistic regression (LR), were developed and trained. The models' performance was evaluated based on the area under the receiver operating characteristic curve (AUC).

Results: The dataset comprised 1121 patients who underwent HoLEP. EBM showed superior performance, with an AUC of 0.64, followed by random forest (AUC 0.62), logistic regression (AUC 0.58), XGBoost (AUC 0.56), and SVC (AUC 0.53). The EBM model identified significant preoperative factors influencing one-month postoperative Qmax, which included age, ASA score, and the interaction between age and the preoperative catheterization time.

Conclusions: This comparative study shows that the EBM and RF model provides the most accurate prediction of poor Qmax performance at one month after HoLEP. The predictive precision of these machine-learning models outweighs the XGB and SVC models, as well as the classically used LR model. By adopting cutting-edge machine-learning algorithms in both research and clinical practice, urologists may achieve unprecedented levels of precision in predicting specific outcomes, thereby enabling the establishment of more accurate postoperative prognoses and patient expectations.



MP 5.7. Figure 1. AUC curves for the tested machine-learning models.



MP 5.7. Figure 2. EMB prediction model showing the most significant factors contributing to the outcome.

MP 5.8

Assessing the utility of ChatGPT in answering common urologic questions

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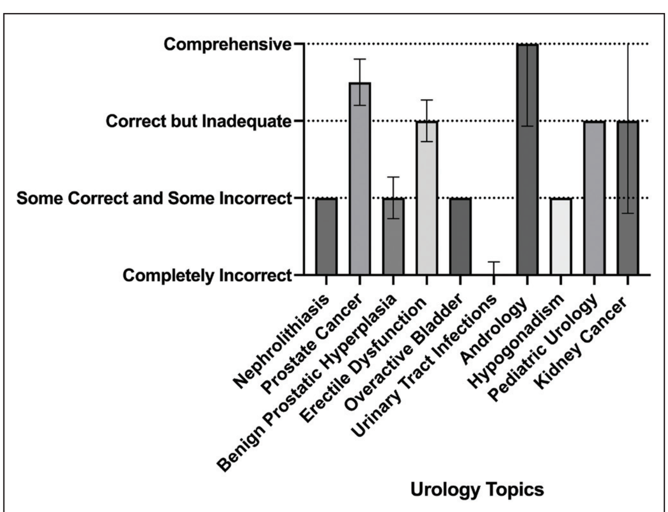
Introduction: ChatGPT, an interactive natural language processing model (LPM), is becoming increasingly used by the public for medical information-gathering. The objective of this study was to investigate and quantify the accuracy of ChatGPT's responses to common urologic questions compared to the Canadian Urological Association (CUA) guideline recommendations.

Methods: A list of 10 common urologic questions were developed from review of the CUA website and patient information materials. To account for potential variance in ChatGPT model responses (OpenAI, San Francisco), each question was asked three times using new chat functions. ChatGPT responses were assessed by three urologists for perceived difficulty, appropriateness, accuracy, and repeatability. The median values and variance of answer scores were calculated to form a consensus score to determine model reliability. Descriptive statistics and Student's t-test were used for analysis. Answers were assessed using a Likert scale based on accuracy and comprehensiveness with CUA guidelines as reference.

Results: A total of 30 unique answers were generated by ChatGPT in response to the 10 urologic questions. Of these responses, 40% (12/30) were found to be appropriate. Questions were classified as "Easy" (50%) and "Medium" (50%) difficulty. The overall mean ± standard deviation score was 1.58±0.79 (between "Some correct and some incorrect" and "Correct but inadequate"). The average variance between ChatGPT responses was 0.067, demonstrating strong model reliability. ChatGPT generated the most appropriate responses in the domains of prostate cancer (2.50±0.30), kidney cancer (2.00±1.20), and andrology (3.00±1.07) out of a maximum score of 3 (Figure 1).

Conclusions: This study was the first to examine the clinical utility of ChatGPT in answering common urologic questions from a Canadian context based on CUA guidelines. Although promising, ChatGPT underperforms in answering common urologic questions despite showing high levels of repeatability.



MP 5.8. Figure 1. Median values and variance of the three ChatGPT-generated responses per subject scored by three licensed Canadian urologists.

MP 5.9

Performance of artificial intelligence on a simulated urology board exam: Is CHATGPT ready for primetime?

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Introduction: Generative artificial intelligence (AI) has proven to be a powerful tool, with increasing applications in clinical care and medical education. CHATGPT has performed adequately on many specialty certification and knowledge assessment exams. CHATGPT 3.5 was shown to have an underwhelming performance on the urology SASP exam. The objective of this study was to assess the performance of CHATGPT 4.0 on a multiple-choice exam meant to simulate the Canadian board exam.

Methods: Graduating urology residents representing all Canadian training programs gather yearly for a mock exam that simulates their upcoming board-certifying exam. The exam consists of a written multiple-choice question (MCQs) exam and an oral OSCE. The 2022 exam was taken by 37 graduating residents and was administered to CHATGPT 4.0.

Results: CHATGPT 4.0 scored 46% on the MCQ exam, whereas the mean and median scores of graduating urology residents were 62.6% and 62.7%, respectively. This would place CHATGPT's score 1.8 standard deviations from the median. The percentile rank of CHATGPT would be in the sixth percentile. CHATGPT scores on different topics of the exam were as follows: oncology 35%, andrology/BPH 61.5%, physiology/anatomy 66.7%, incontinence/female urology 23.1%, infections 71.4%, urolithiasis 57.1%, and trauma/reconstruction 16.7%.

Conclusions: CHATGPT 4.0 underperforms on an MCQ exam meant to simulate the Canadian board exam. Ongoing assessments of the capability of generative AI is needed as these models evolve and are trained on additional urology content.

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MP 5.10

Proof of concept: A surgical teaching video of a bladder neck dissection during a robotic prostatectomy using a best practices framework of surgical video content and creation

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Introduction: Surgical teaching videos currently read as audiovisual representations of surgical textbooks using minimal evidence-based guidelines of structure or objectives. We sought to determine how surgical videos could be designed to meet the learning needs in robotic surgery and clarify surgical teaching video best practices. We explored the use of surgical videos through qualitative interviews with fellows and expert surgeons and produced a surgical teaching framework and video as a proof of concept of a bladder neck dissection during a robotic prostatectomy.

Methods: One-hour semi-structured interviews with fellows and expert surgeons were completed between December 2021 and May 2022. Six expert surgeons and three surgical fellows experienced in robotic surgery participated. Thematic areas explored included experience with robotic learning materials and goals for video learning. Interviews explored surgeons' motivations and methods for selecting videos, and how they fit into the context of their continued learning and use of resources. Best practice themes were synthesized into a framework to create a surgical teaching video of a bladder neck dissection during a robotic prostatectomy.

Results: Thematic analysis found that while fellows were motivated to "model" behavior, expert surgeons were motivated to identify new techniques or novel components of a surgery. Both fellows and expert surgeons assessed the institution where the surgery was performed, who the surgeon was performing the surgery, narration for surgical progress, and error avoidance as motivators for viewing videos. A surgical video of a bladder neck dissection using the best practices data was produced as a proof of concept.

Conclusions: The findings show both fellow and expert surgeons' motivations and how videos are used for their learning. A proof-of-concept surgical teaching video was able to be produced to enhance surgeons' continued professional development and learning.

Acknowledgements: This paper is based on a research project funded by the AO Foundation. The funding source had no involvement in study design; in the collection, analysis or interpretation of data; in the writing of the report; or in the decision to submit the article for publication. The funding was, however, instrumental in the completion of the research and development of the surgical video.

MP 5.11
Canadian urology resident research productivity: A cross-sectional study

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Introduction: Scholarship is important for selecting future urology residents and subsequent postgraduate urology training; however, research expectations and output may differ across programs and individual residents. An understanding of the current baseline research productivity among Canadian urology residents, along with the factors contributing to scholarly success, can provide insights for curriculum development and potential applicants.

Methods: This cross-sectional study evaluated research productivity of all active Canadian urology residents as of November 2023 using public data. Trainee names and demographic data were collected using residency program websites and a systematic web search. Trainee names were searched on Scopus to obtain information on publication metrics. The total number of publications during residency were separated from publications pre-residency and divided by postgraduate year (PGY) to calculate the average number of publications produced each year in residency (publications-per-PGY). Descriptive statistics were used to characterize resident demographics. A higher number of publications or publications-per-PGY was based on being within the top 15% of all residents. Binary logistic regressions were used to model the association between residency program and being a resident within the top 15% of publications-per-PGY.

Results: In total, 181 Canadian urology residents were reviewed, of which 67% of residents were male. Most residents (57%) have not completed a graduate degree before entering training. Twenty-three percent of residents are graduate degree holders and 15% of these were doctorates. All PGY levels had a median of 1.0 pre-residency publications, except for PGY-1s who had 2.0 (p=0.38). Median total publications is 4.0 (IQR 1.0–8.0) and the median publication-per-PGY is 0.75 (IQR 0.03). Median h-index is 2.0 (IQR 0.0–4.0). Male residents had a median of 1.0 pre-residency publications (IQR 0.0–4.0), while females had 0.0 (IQR 0.0–3.0) (p=0.02). This difference did not persist during residency (p=0.07). Pre-residency publications were significantly positively correlated with publications-per-PGY (r=0.53, p<0.001). Graduate degree holders were more likely to have a higher total number of publications (OR 2.46, p=0.02); however, this became insignificant in the average annual number of publications during residency (OR 1.91, p=0.08), suggesting that productivity during residency is not influenced by previous degrees. One residency program (B=0.43, p<0.001) was significantly associated with having higher publications-per-PGY. Publication details by residency program are presented in Table 1.

Conclusions: Our cross-sectional study reveals variations in research productivity among Canadian urology residents. We did not appreciate an increasing trend in pre-residency research productivity across the five PGY cohorts. While previous graduate education and sex are associated with pre-residency publication productivity, these associations were no longer appreciated during residency. Fewer publications by female applicants may underscore gender disparities in early mentorship and access to research.

MP 5.11. Table 1. Mean publication metrics per resident by residency program

Program	H-index, resident mean (SD)	Total publications, resident average (SD)	Publications published during residency per postgraduate year, resident average (SD)	Pre-residency publications, resident average (SD)
University of Alberta	3.9 (4.0)	5.9 (5.8)	0.6 (0.5)	4.1 (5.4)
Dalhousie University	2.3 (1.5)	6.1 (3.3)	1.0 (0.5)	2.6 (3.0)
University of British Columbia	3.1 (2.4)	7.0 (2.4)	1.0 (0.5)	3.3 (3.3)
University of Western Ontario	1.7 (0.9)	2.7 (2.3)	0.6 (0.6)	0.9 (0.9)
University of Toronto*	5.9 (6.5)	22.7 (29.6)	3.9 (5.9)	10.8 (20.0)
McMaster University	1.9 (1.6)	5.1 (5.1)	1.0 (1.2)	2.0 (2.5)
University of Manitoba	1.5 (1.5)	3.9 (3.7)	1.0 (0.7)	0.7 (1.2)
McGill University	2.5 (1.8)	6.5 (7.8)	1.5 (2.7)	2.7 (4.2)
Université de Montréal	2.2 (1.5)	6.5 (4.9)	1.8 (1.6)	1.9 (2.7)
Université Laval	1.4 (1.3)	2.1 (2.4)	0.3 (0.4)	0.8 (1.5)
Queen's University	2.3 (2.8)	6.0 (7.9)	0.4 (0.4)	5.2 (8.3)
Ottawa University	1.7 (1.3)	3.8 (3.7)	0.9 (1.6)	1.7 (1.7)
Université de Sherbrooke	0.7 (0.8)	0.8 (1.0)	0.4 (0.8)	0.2 (0.4)

*Residents of this residency program were found to be significantly associated (p<0.001) with higher publications produced during residency divided by PGY level. Mean total publications: Average of total publications by each resident, including during and pre-residency publications. Mean number of publications during residency per postgraduate year: Average of total number of publications produced during residency divided by PGY level. Mean pre-residency publications: Average of total number of publications before entering residency.

MP 5.12
Development of a novel and low-cost continuous bladder irrigation management simulator for nursing education

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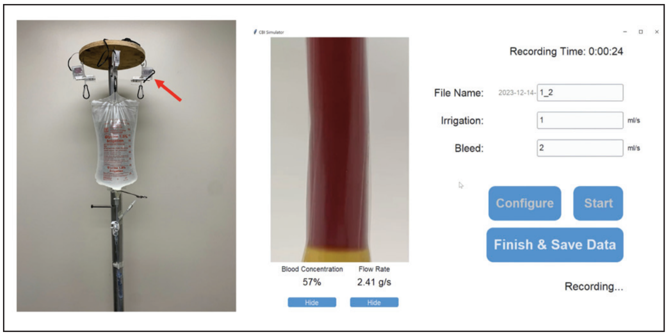
Introduction: Continuous bladder irrigation (CBI) is regulated solely by the roller clamp affixed to CBI tubing, with its rate estimated visually using the drip chamber; however, recent work by Shaikh et al showed the highly variable estimation of the inflow rate by providers, and the lack of consensus when titrating for a particular effluent color. Furthermore, CBI training is generally lacking and is predominantly a process of trial and error. Recognizing this gap, we developed a simulator tool to augment CBI education and practice. To our knowledge, our device is the first and the only CBI simulator platform in the world.

Methods: The hardware component of our system includes an amplified load cell in a custom 3D-printed enclosure, which hangs from a standard IV pole with saline bags attached. The weight change of saline bags is measured every 100 ms to calculate the inflow rate. A custom Python program provides an intuitive user interface for the operator. The image of a mock effluent tube (0–100% diluted bovine blood) is shown and updated in real-time, simulating the color of the drainage tube effluent. The complete setup is shown in Figure 1. The real-time measurement of the saline bag's weight, inflow rate, effluent color, and effluent blood concentration, are saved.



MP 5.12. Figure 1. Overview of the CBI simulator platform, with the irrigation bag weight-sensing module (left, red arrow) and a user interface (right).

Results: A series of validation tests with varied bleed rates (1–3 ml/s) and bladder volumes (50–250 ml) showed that our device accurately mimics the delivery of CBI, with the mock effluent color responding to the adjustment of inflow and bleed rates in real-time. Using our system, providers can learn and practice adjusting the roller clamp in response to changes in the inflow rate and effluent color. Moreover, our system is low-cost (<$20 in components), portable, and easy to set up, making it widely accessible.
Conclusions: Our simulator platform has the potential to provide valuable real-time feedback for nurses and improve CBI outcomes. Future studies will be focused on establishing the construct validity of this tool.

MP 5.13

Assessing healthcare professionals' perception and grading of an artificial intelligence documentation tool for clinical notes in the urologic care setting

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Introduction: With the advent of natural language processing, artificial intelligence (AI) can encode conversational language, thereby providing a tool to potentially alleviate the increasing burdens of medical documentation. By using a simulated stone clinic encounter, we aim to assess the perceived accuracy, quality, and acceptance of AI documentation by members of our ambulatory clinic (urologists, nurse case managers, trainees).
Methods: A cross-sectional survey was employed to assess a clinical note generated by a HIPPA-compliant web browser-based AI medical documentation service. A simulated ambulatory stone clinic encounter was recorded. Clinicians (urologists, residents, nurses) listened to the recording, then reviewed the AI-generated clinic note/letter, and then answered a survey grading key elements of the documentation.
Results: Participants (five urologists, three residents, and three nurse case managers) rated the AI-generated document on a five-point Likert scale, finding: readability 4.73, inclusion of appropriate elements 4.73, exclusion of extraneous elements 4.00, appropriateness of omitted elements 4.45, accuracy of history and investigations 4.64, and accuracy of the stated plan were 4.70. Key omissions included a discussion of alternative therapeutic options. Most participants (6/11) would alter 1) formatting; 2) more details around procedural discussions; 3) more details on medication and allergies discussions; and 4) adding 'tone'. Given this, almost all participants (10/11) stated that they would be comfortable using this as their EMR note.
Conclusions: Clinical notes generated with AI show promise in their current availability. Further work on the perceptions of clinicians and patients, and the quality of generated documents will help guide the adoption and transition from traditional strategies.

MP 5.14

Perceptions of the novel Canadian Urology Residents Exam Study (CURES) Group

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Introduction: The Canadian Urology Residents Exam Study (CURES) Group is a new initiative for senior urologic trainees to assist in their study for the Royal College of Physicians and Surgeons of Canada (RCPSC) exam. Quarterly online sessions are mentored by urology faculty from multiple academic centers across Canada in order to bring different perspectives to study topics and provide formative assessment via oral exams and multiple-choice questions (MCQs). This study assesses participants' perceptions of the CURES sessions and gauges future interest, following the completion of its inaugural year.
Methods: At the annual Queen's Urology Examination Skills Training (QUEST) Program, a survey consisting of 16 questions, using a five-point Likert scale, was administered to the 34 participants. Questions addressed attitudes and future interest in the CURES sessions.
Results: Of the 34 participants, 33 had heard of the CURES sessions and 94% of those attended at least one session. Most (79%) respondents felt satisfied with the quality of the sessions, with 94% considering it valuable to be exposed to teaching by faculty from other programs. Although only two participants attended all four sessions, 88% agreed or strongly agreed that future sessions would be a beneficial study aid. A majority favored the sessions to include high-yield topic reviews with MCQs as opposed to group OSCE stations. Topics suggested for future sessions included functional and female urology, reconstruction, and pediatrics.
Conclusions: The CURES Group initiative provides a complementary study resource to senior urology residents in Canada that is worth continuing. Quarterly high-yield reviews with formative MCQs was the suggested platform for the most recent graduating cohort of residents.
Acknowledgements: CURES is funded by an unrestricted education grant from Abbvie.

MP 5.15

Reducing resident fluoroscopy time during ureteroscopy: Pilot study

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Introduction: Fluoroscopy is a critical tool used in endourology, allowing for the safe performance of ureteroscopy and laser lithotripsy. Precautions exist to protect operating room staff and patients from the compounding radiation associated with prolonged fluoroscopy time (FT). A lower level of experience is typically associated with longer FT, particularly in residents who are still learning the steps of a procedure. The aim of this pilot quality improvement study was to utilize a revised surgical safety checklist and visual reminder to reduce FT in urology residents.
Methods: This was a pre-post quality improvement initiative pilot study performed at a single center. The intervention was the implementation of a surgical checklist, including a statement on minimizing FT used in all urologic procedures requiring fluoroscopy conducted by resident physicians. Additionally, a sign was posted in direct view of the operator reminding residents to limit FT. Pre-intervention data was collected retrospectively via chart review. Additional procedural data, such as patient presentation, instruments used, and stone parameters, were collected.
Results: A total of 36 procedures requiring fluoroscopy were analyzed, including 15 pre-intervention (33% female) and 21 post-intervention (43% female). The mean age of participants in the pre-intervention group was 63.4±12.2 as compared to 59.7±13.9 in the post-intervention group. Body mass index was also comparable across the pre- and post-intervention groups (29.9±6.2 vs. 29.5±6.3). Laser lithotripsy was performed in the majority of cases (85% pre-intervention; 90% post-intervention). There was a significant decrease in mean FT in the post-intervention group (18.8±12.9 seconds) as compared to the pre-intervention group (69.3±42.8 seconds, $p<0.05$).

Conclusions: This pilot study validated the implementation of a simple, low-cost quality improvement initiative for decreasing FT in urology residents. Further, the preliminary analysis suggested that the intervention was associated with decreased FT contributing to reduced risk for both patients and healthcare staff. Future directions include implementing this protocol across multiple centers and levels of training.

MP 5.16

Adoption of artificial intelligence reporting guidelines in urology remains low: A preliminary analysis and call to action

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Introduction: As the investigation of artificial intelligence (AI) applications in urology expands, the reproducibility of these studies has been challenged. While AI-reporting guidelines have recently been developed to mitigate these concerns, their overall adoption remains unknown. This review examines the use of AI-reporting guidelines in urology and identifies common reporting limitations among these AI studies.

Methods: MEDLINE and EMBASE were searched from inception to August 25, 202,3 for primary AI studies published in the 10 most influential journals in urology based on the 2022 Web of Science Journal Impact Factor reports. These included European Urology, Nature Reviews Urology, European Urology Oncology, Journal of Urology, European Urology Focus, Minerva Urology and Nephrology, Prostate Cancer and Prostatic Diseases, World Journal of Mens Health, BJU International, and International Brazilian Journal of Urology. Studies were included if they focused on the development or validation of any AI application in urology. Use of published AI-reporting guidelines and best practices in AI model evaluation were assessed.

Results: Sixty-six studies met the inclusion criteria and were all in the retrospective model development/validation stages. The two most common subspecialties incorporating AI were uro-oncology (n=41) and endourology (n=8). The most common conditions studied were prostate cancer (n=24), bladder cancer (n=8), and urolithiasis (n=7). Only three studies adhered to an AI-reporting guideline (STREAM-URO). While most studies described model performance with respect to discrimination (n=57), few reported on calibration (n=11), net benefit (n=8), or bias assessment (n=5).

Conclusions: This preliminary analysis reveals that AI-reporting guidelines have received little attention among current AI studies published in these urologic journals. Importantly, this review does not capture the full scope of urologic AI studies and further investigation is underway to conduct a meta-search to comprehensively assess the adoption of AI-reporting guidelines in urology.

MP 5.17

Incidence and predictors of delays in commencing fellowship training in urology

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Introduction: The completion of residency and start of fellowship training marks a critical transition for urologists in the pursuit of subspecialty training. Most graduating urology residents are under contract until June 30, and the majority of fellowships are scheduled to begin on July 1. Fellowship training may require relocation, hospital credentialing, new medical licenses, and governmental clearances leading to possible delays in clinical starts. The consequences of urologic fellowship delays are poorly understood and the burden on each party involved (trainee, residency training program, and fellowship training program) remains unmeasured. Our research study aimed to investigate the incidence and predictors of delays in fellowship starts.

Methods: We surveyed 250 Endourologic Society (EU) fellows (2017–2022) and 90 pediatric urology (PU) fellows (2019–2023). Both cohorts received initial email correspondence with a survey link, and one reminder email three weeks later. Statistical analysis was performed using SAS statistical software for descriptive statistics, Chi-squared tests, and Fisher's exact tests where appropriate.

Results: Relocation was common in both cohorts, with 41.6% of EU and 81.6% of PU fellows moving to a new state or province. Almost half of fellows exited their residency positions prior to their contracted residency completion date (33.8% vs. 44.9%, p=0.2097). A total of 26.0% and 14.3% of EU and PU fellows, respectively, experienced delays in their fellowship training. Of those experiencing delays, 45.0% and 48.1% reported delays to be "very stressful." Most fellows reported hospital credentialing as the main contributing factor to their delay (EU 15.6% and PU 6.1%). Of all survey respondents, 86.0% (108/126) supported modifying the traditional July 1 fellowship start date.

Conclusions: Delays in fellowship training do occur at a notable rate despite nearly half of urology fellows leaving their residency training positions early, with unclear impacts on patient care and resident colleague well-being. Adjustments in the time from resident completion to fellowship initiation could help to alleviate delays in training and the stress associated with these delays. It remains unclear how fellowship delays affect the diversity of future fellowship candidate selection and overall training experience.

MP 5.18

Evaluation of the experiences of successful urology residency applicants

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Introduction: Residency applicants often perceive urology as a competitive surgical subspecialty. The factors that make a competitive applicant are not always clear, and data on successful applicants isn't readily available. Thus, this study aimed to describe the experiences of successful urology resident applicants.

Methods: A survey was sent to the 2021–2022 and 2022–2023 urology residency applicant pool applying to the Urology Residency Match Program overseen by the AUA and the Society of Academic Urologists. The survey collected data on demographics, quantitative performance metrics (including USLME scores and number of research items), as well as other factors, such as the number of urology electives and mentorship. Results were analyzed via descriptive statistics. A logistic regression model and unpaired t-tests with significance set at α=0.05 were used determine the factors associated with a successful match.

Results: A total of 468 participants responded to the survey, of which 374 (80.7%) successfully matched to a urology residency program. Successful participants had a higher Step 1 score (242.5 vs. 235.2, p=0.0002) and a higher Step 2 score (253.1 vs. 243.2, p≤.0001). Of the non-quantitative measures examined, the strongest predictor of a successful match was having at least one urology mentor (OR 6.91, 95% CI 2.73–18.81). No significant differences were observed between matched and unmatched applicants in the number of peer-reviewed publications (3.05 vs. 2.2, p=0.43), abstract presentations (4.7 vs. 2.84, p=0.18), and number of programs applied to per participant (90.85 vs. 90.08, p=0.061).

Conclusions: This project demonstrates the impact of quantitative performance and non-academic objective measures, particularly USMLE step scores and presence of a urology mentor, on the success of an applicant's urology residency match. With increased efforts to increase diverse representation in urology, this study can provide guidance in the development of mentorship and related programming.

MP 5.17. Table 1. Fellowship delay endourology and pediatric urology cohort analysis

	Endourology (n=77)	Pediatric urology (n=49)	Total (n=126)	P
Fellowship duration				<0.0001
1 year	57.1% (44)	4.1% (2)	36.5% (46)	
2 years	42.9% (33)	89.8% (44)	61.1% (77)	
3 years	0.0% (0)	6.1% (3)	2.4% (3)	
Moved for fellowship				<0.0001
No	14.3% (11)	8.2% (4)	11.9% (15)	
Moved cities	11.7% (9)	4.1% (2)	8.7% (11)	
moved states/provinces	41.6% (32)	81.6% (40)	57.1% (72)	
moved internationally	32.5% (25)	6.1% (3)	22.2% (28)	
Year of fellowship start				<0.0001
2017	20.8% (16)	0.0% (0)	12.7% (16)	
2018	14.3% (11)	0.0% (0)	8.7% (11)	
2019	23.4% (18)	20.4% (10)	22.2% (28)	
2020	27.3% (21)	10.2% (5)	20.6% (26)	
2021	11.7% (9)	18.4% (9)	14.3% (18)	
2022	2.6% (2)	18.4% (9)	8.7% (11)	
2023	0.0% (0)	32.7% (16)	12.7% (16)	
Began fellowship immediately after residency completion				<0.0001
Yes	57.1% (44)	93.9% (46)	71.4% (90)	
No	42.9% (33)	6.1% (3)	28.6% (36)	
Left residency before official completion date (June 30)				0.2097
Yes	33.8% (26)	44.9% (22)	38.1% (48)	
No	66.2% (51)	55.1% (27)	61.9% (78)	
Structure of 1st-year fellowship				
Only research	–	30.6% (15)		
Primarily research with some clinical	–	18.4% (9)		
Primarily clinical with some research	–	22.5% (11)		
Only clinical	–	28.6% (14)		
Structure of 2nd-year fellowship				
Only research	–	4.1% (2)		
Primarily research with some clinical	–	44.9% (22)		
Primarily clinical with some research	–	18.4% (9)		
Only clinical	–	32.7% (16)		
Official fellowship start date				<0.0001
July 1	100.0% (77)	61.2% (30)	84.9% (107)	
July 1–7	0.0% (0)	14.3% (7)	5.6% (7)	
July 8–20	0.0% (0)	14.3% (7)	5.6% (7)	
July 21–31	0.0% (0)	0.0% (0)	0.0% (0)	
August 1	0.0% (0)	8.2% (4)	3.2% (4)	
After August 1	0.0% (0)	2.0% (1)	0.8% (1)	
Requested to present prior to official fellowship start date				
Yes	–	42.9% (21)		
No	–	57.1% (28)		
Delay in clinical training or credentialing after official start date				0.1807
Yes	26% (20)	14.3% (7)	21.4% (27)	
No	74% (57)	85.7% (42)	78.6% (99)	
Causes of delay				<0.0001
Hospital credentialing	15.6% (12)	6.1% (3)	10.3% (15)	
Orientation	3.9% (3)	4.1% (2)	3.5% (5)	
Medical license	9.1% (7)	6.1% (3)	6.9% (10)	
Government delays (i.e., SSN)	3.9% (3)	2.0% (1)	2.8% (4)	
Immigration delays (i.e., VISA)	2.6% (2)	2.0% (1)	2.1% (3)	
COVID	6.5% (5)	0.0% (0)	3.5% (5)	
Urology board exam	0.0% (0)	4.1% (2)	1.4% (2)	
Medical leave	2.6% (2)	0.0% (0)	1.4% (2)	
None	74% (57)	85.7% (42)	68.3% (99)	

MP 5.17. Table 1 (cont'd). Fellowship delay endourology and pediatric urology cohort analysis				
	Endourology (n=77)	Pediatric urology (n=49)	Total (n=126)	P
Duration of delay in clinical activities or credentialing				0.0007
<1 week	9.1% (7)	2.0% (1)	6.3% (8)	
1–2 weeks	3.9% (3)	2.0% (1)	3.1% (4)	
2–4 weeks	5.2% (4)	6.1% (3)	5.5% (7)	
4–6 weeks	7.8% (6)	4.1% (2)	6.3% (8)	
>6 weeks	2.6% (2)	0.0% (0)	1.6% (2)	
None	74% (57)	85.7% (42)	77.3% (99)	
If a delay was experienced, how stressful was it?				0.0042
Not at all stressful	7.8% (6)	2.0% (1)	5.5% (7)	
Somewhat stressful	9.1% (7)	2.0% (2)	7.0% (9)	
Very stressful	11.7% (9)	8.2% (4)	10.2% (13)	
No delay	74% (57)	85.7% (42)	77.3% (99)	
Ideal fellowship start date				0.3162
July 1	19.1% (13)	6.4% (3)	13.9% (16)	
July 8	7.4% (5)	12.8% (6)	9.6% (11)	
July 15	30.9% (21)	31.9% (15)	31.3% (36)	
July 21	5.9% (4)	4.3% (2)	5.2% (6)	
August 1	36.8% (25)	44.7% (21)	40.0% (46)	