Podium Session 5: Urology Practice, Education, Research
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POD 5.1

Sex- and gender-based analysis in urologic research

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Introduction: Female participants are historically underrepresented in clinical research, resulting in a paucity of sex- and gender-based analysis (SGBA). In the context of urology, SGBA is critical for understanding differences in disease pathophysiology, response to treatment, and disparities in access to care. This study aimed to assess the utilization of SGBA in urologic research in the past five years.

Methods: All interventional and observational studies published from 2019 to July 2023 in the Journal of Urology, Canadian Urological Association Journal, British Journal of Urology International, Urology, European Urology, and BioMed Central Urology were assessed for eligibility. Articles were included if the topic applied to both female and male patients, allowing for the assessment of SGBA. Articles published in 2022 and 2023 were assessed based on the 2022 Sex and Gender Equity in Research (SAGER) guidelines checklist. The checklist provides guidance for researchers and journal reviewers/editors to ensure the consideration of SGBA in publications.

Results: A total of 4702 original research articles were assessed for eligibility, of which 2998 were excluded. The included articles (n=1704) had a pooled 23 333 793 participants (50% male, 42% female, 8% sex not reported). Topics with the highest proportion of articles that did not report sex/gender were urethroplasty (n=73%), congenital (50%), and urolithiasis (22%). The most common reason for exclusion was a sex-specific study topic (n=2217). In 2022/2023, the terms sex and gender were used appropriately in 42% and 44% of articles, respectively. The SAGER checklist was subdivided by article section, with 13% of titles/abstracts, 6% of introductions, 8% of methods, 28% of results, and 18% of discussions/conclusions from 2022/2023 articles meeting the criteria. Observational studies were more likely to adhere to SAGER guidelines than interventional studies for all article sections.

Conclusions: The present study is the first to investigate the representation of female participants, as well as SGBA in urology research. Overall, there were more male than female participants and most studies did not address SAGER guidelines for SGBA. The inclusion of SGBA and reporting requirements in journals is crucial in promoting equity in urology research and patient care.

POD 5.1. Table 1

	# of Studies (n)	# of Patients (n)	# of Patients Reported as 'Male' or 'Men' (n (%))	# of Patients Reported as 'Female' or 'Women' (n (%))	# Patients Non-Gender Conforming (n (%))	# Patients Sex/Gender Not Reported (n (%))
Total	1704	23333793	11566013 (50%)	9783954 (42%)	20 (0%)	1983806 (9%)
Topic						
Bladder Cancer	349	2690241	1495362 (56%)	1097090 (41%)	0 (0%)	97789 (4%)
Urolithiasis	289	3649757	1685002 (46%)	1158359 (32%)	12 (0%)	806384 (22%)
Renal Cancer	180	614332	355585 (58%)	234561 (38%)	0 (0%)	24186 (4%)
Overactive Bladder & Incontinence	172	4712887	1868190 (40%)	2843966 (60%)	0 (0%)	731 (0%)
General Urology	155	8530667	4850010 (57%)	3167643 (37%)	2 (0%)	513012 (6%)
Cystectomy	135	183382	137897 (75%)	36233 (20%)	0 (0%)	9252 (5%)
Nephrectomy	89	326816	161678 (49%)	105831 (32%)	0 (0%)	59307 (18%)
Renal Mass	67	506630	243790 (48%)	232069 (46%)	0 (0%)	30771 (6%)
Congenital Urological Conditions	58	830250	204024 (25%)	210956 (25%)	0 (0%)	415270 (50%)
Pelvic Pain Syndromes	41	15799	4940 (31%)	10826 (69%)	0 (0%)	33 (0%)
Kidney Transplant	33	99474	56442 (57%)	41865 (42%)	0 (0%)	1167 (1%)
Urological Infections	33	293523	38890 (13%)	251673 (86%)	0 (0%)	2960 (1%)
Urological Trauma	27	166851	105137 (63%)	48934 (29%)	0 (0%)	12780 (8%)
Urethroplasty	24	13549	3197 (24%)	413 (3%)	6 (0%)	9933 (73%)
Renal Dysfunction	20	510124	279604 (55%)	230520 (45%)	0 (0%)	0 (0%)
Pyeloplasty	14	1869	1099 (59%)	612 (33%)	0 (0%)	158 (8%)
Miscellaneous Topics	12	184146	73125 (40%)	110948 (60%)	0 (0%)	73 (0%)
Adrenal Mass	6	3496	2041 (58%)	1455 (42%)	0 (0%)	0 (0%)
Year						
2019	412	2148120	903129 (42%)	580477 (27%)	0 (0%)	664514 (31%)
2020	380	9775784	4428705 (45%)	5220897 (53%)	0 (0%)	126182 (1%)
2021	389	5536913	3305220 (60%)	2088599 (38%)	0 (0%)	143094 (3%)
2022	346	3519119	1564868 (44%)	1030889 (29%)	8 (0%)	923354 (26%)
2023 (Jan-July)	177	2353857	1364091 (58%)	863092 (37%)	12 (0%)	126662 (5%)

POD 5.2

Five years of competence by design in Canadian urology: National survey of faculty and residents

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Introduction: Canadian urology residency programs transitioned to a "competence by design" (CBD) method of training in 2018. The application of CBD is intended to be outcomes-based, learner-centered, allow for enhanced flexibility and accountability, and focus on achieving skills and performance rather than measuring time spent in training. Pre-implementation perceptions of CBD included expectations of increased feedback and tailored learning; however, there is a paucity of literature regarding the perceptions of CBD five years after its implementation in Canada.

Methods: Ethics approval was obtained from the Research Ethics Board at Centre Hospitalier de l'Université de Montréal. A 42-question anonymous survey was sent electronically to all senior urology residents (PGY 4/5) at all 13 urology residency programs across Canada between January and April 2023. During the same time frame, a 43-question anonymous survey was distributed to all program directors at all urology programs across Canada. Program directors were asked to forward to the survey to other faculty members for convenience sampling. Questions were designed to assess demographics, perceived benefits and failures, perceived challenges, and overall satisfaction with CBD. Responses were assessed using a Likert-scale. Descriptive statistics were performed.

Results: The overall survey response rate from senior residents and program directors was 53% (33/62) and 77% (10/13), respectively. A total of 29 faculty members completed the survey. Over 70% of respondents are dissatisfied with CBD. Both resident and faculty members find that CBD is time-consuming and burdensome. Most (70%) residents and faculty (88%) respondents experienced anxiety and fatigue due to CBD; 80% of senior residents and 58% of faculty disagree that CBD has de-emphasized time-based learning; 70% of all respondents disagree that CBD has enhanced the quality of feedback; and 90% of all respondents do not feel that CBD has meaningfully enhanced patient care or safety.

Conclusions: In the first five years of CBD in Canadian urology, there is generalized dissatisfaction with CBD among senior residents and faculty members. CBD has negatively impacted faculty and resident wellness and is a source of anxiety and fatigue. CBD has failed to personalize medical education but has positively impacted medical education by providing a clear roadmap for trainee progression.

POD 5.3

Safety and efficacy of ultrasound-assisted bedside ureteric stent placement without skilled assist: A prospective, single-institution study

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Introduction: Ultrasound-assisted bedside ureteric stent placement can be a valuable tool for the treatment of acute obstructing ureteric obstruction, especially in a system where operating room time may be scarce. Previous studies have demonstrated the feasibility of bedside placement of ureteric stents; however, have traditionally required the presence of two skilled operators. We sought to investigate the efficacy and safety of ultrasound-assisted bedside ureteric stent insertion without the presence of a skilled assist for acute obstructing ureteric stones.

Methods: A single-institution, prospective study was performed from April to August 2023. Indications for stenting included infection, renal insufficiency, or intractable colic. Exclusion criteria included age <18 years old, hemodynamic instability, and patients with history of chronic pain. All patients underwent post-procedure XR KUB to confirm stent placement. Descriptive statistics were performed using SPSS.
Results: All (28 of 28) patients underwent successful bedside ureteric stent insertion in the three-month period. Demographics of our cohort included mean age of 64.9 years, mean BMI of 33.2, and mean stone size of 8.1 mm, with a range of 4–15 mm. Fifty-two percent of patient had proximal ureter obstruction, while 44% had distal ureter obstruction. Infection was the indication for stent placement in most patients (67%). All patients who underwent successful stent did have presence of hydronephrotic drip from the ureteric catheter. Two of the 28 cases did require a skilled assist due to technical challenges, however, successful stent placement was still accomplished.
Conclusions: Ultrasound-assisted bedside ureteric stent insertion without the presence of a skilled assist is a safe and feasible option for management of acute ureteral obstruction. Presence of hydronephrotic drip can indicate successful wire placement for providers that are unfamiliar with point of care ultrasound.

POD 5.3. Table 1

Gender	
Male	28.6%
Female	71.4%
Mean patient age (years)	64.9
Mean BMI	33.2
Cause of obstruction	
Stone	85.7%
Malignancy	7.1%
UPJO	3.6%
Hydronephrosis (unspecified)	3.6%
Indication for stent	
Infection	67.0%
Pain	24.0%
AKI	19.0%
Mean stone size (mm)	8.1
Obstruction location	
Distal ureter	44.0%
Mid ureter	4.0%
Proximal ureter	52.0%
Laterality	
Right	46.4%
Left	42.9%
Bilateral	10.7%
Location of procedure	
ER	67.9%
Ward	25.0%
ICU	7.1%

POD 5.4

Microbial-derived uremic toxins improve calcium oxalate stone formation, adherence, and severity by inducing oxidative stress and selecting for the monohydrate morphology in vitro and in vivo

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Introduction: The prevalence of kidney stones is on the rise, highlighting the need for a better understanding of their underlying causes. The microbiota-derived uremic toxins indoxyl sulfate, p-cresyl sulfate, and their precursors enhance the production of reactive oxygen species (ROS) in the kidneys and can lead to increased calcium concentrations in the blood of humans. Interestingly, the gut microbiota of calcium-based stone formers is primed with bacterial species that produce these uremic toxins. As such, this study aimed to investigate the relationship between uremic toxins and calcium oxalate (CaOx) stone formation. Specifically, we examined the impact of uremic toxins on crystal formation both in vitro and in vivo, using multiple models.
Methods: The direct effect of uremic toxins on CaOx crystallization and adherence was assessed in vitro using a standard gel-based assay, artificial urine, and cell-culture. Next, a Drosophila melanogaster model of nephrolithiasis was used to determine if the uremic toxins promote CaOx crystallization, ROS production, and gut microbiota changes in vivo.
Results: Indoxyl sulfate, p-cresyl sulfate, and their precursors directly promoted CaOx crystal production in vitro. Uremic toxin exposure significantly reduced mammalian kidney cell viability and significantly increased CaOx adherence. In addition, indoxyl sulfate promoted the monohydrate morphology during the syntheses of CaOx crystals. D. melanogaster exposed to uremic toxins had increased stone burden within the Malpighian tubules (i.e., fly kidney). Increased stone burden was associated with more ROS production both locally within the Malpighian tubules and systemically. Uremic toxin exposure was also associated with a reduction of short-chain fatty acid producing bacteria, like lactobacilli, which is a common observation in human stone formers.
Conclusions: This is the first study to investigate the role of uremic toxins in kidney stone disease and it demonstrated that gut microbiota-derived uremic toxins directly promote CaOx crystallization. Uremic toxins also enhanced stone burden in vivo by stimulating ROS production in the renal environment of Drosophila. These findings suggest that uremic toxins may augment stone production and adherence to kidney cells, which we confirmed in cell culture. Clinicians can leverage these results to develop novel therapeutic and preventive strategies targeting uremic toxin accumulation to combat kidney stone disease.
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POD 5.5

Exploring the safety and efficacy of ambulatory urologic surgery: A paradigm shift towards optimal resource utilization in outpatient settings

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Introduction: Given considerable waitlists for surgical procedures, novel methods to improve access and delivery of surgical care in Canada is needed. One strategy is to shift select surgeries out of the hospital into community ambulatory centers, offering the advantage of timely surgery and taking away the burden on the hospital system to focus on more critical, complex patients. We sought to evaluate perioperative outcomes performed at a novel urologic outpatient surgical center.
Methods: A retrospective chart review study was conducted between August 2022 and August 2023 at Men's Health Clinic Manitoba, an accredited surgical facility and outpatient clinic. Procedures ranged from scrotal and transurethral surgeries to inflatable penile prosthesis insertion. Patients were seen 4–6 weeks post-procedure. Variables of interest included surgery and anesthesia type, procedure length, postoperative recovery time, visits to the emergency department (ED), and instances of hospital admission.

Results: In a 12-month period, 519 surgeries were conducted in an outpatient setting (Table 1). The mean patient age±SD was 49.6±17.3 years and mean BMI was 28.6±5.5 kg/m2, with most patients classified as ASA 1±2 (88.8%). Most (95.8%, n=497) patients did not seek medical care outside of the clinic prior to their scheduled followup appointment; 2.5% (n=13) visited the ED, with three patients presenting with concerns of wound dehiscence, pain, or possible infection, and two patients going for catheter issues and postoperative swelling. Only 1.7% (n=9) of patients required an appointment with their family physician, with the leading concerns being pain (n=4) or infection (n=4). No patient required hospital admission.

Conclusions: Many urologic surgeries that are classically performed in the hospital can be safely performed in a non-hospital, outpatient surgical facility with preservation of good outcomes. This strategy has the potential to improve the efficiency of urologic healthcare delivery in select patients.

POD 5.5. Table 1. Procedures conducted in one-year period at Men's Health Clinic Manitoba by anesthesia used and frequency

Anesthetic modality	Surgery	Patients (n, %)
Local	Scrotal surgery	153, 29.5%
	Hydrocelectomy	57, 11.0%
	Epididymectomy	42, 8.1%
	Spermatocelectomy	36, 6.9%
	Testicular biopsy	18, 3.5%
	Circumcision	88, 17.0%
	Lesion excision (scrotal or penile)	27, 5.2%
	Dorsal slit/frenulectomy	22, 4.2%
IV sedation (nursing administered)	Penile plication	23, 4.4%
	Incision and grafting	2, 0.4%
IV sedation (anesthesiologist administered)	Microscopic varicocelectomy	67, 12.9%
	Microscopic denervation of spermatic cord	24, 4.6%
	Penile plication	21, 4.0%
	Radical inguinal orchiectomy	19, 3.7%
	Microscopic vasovasostomy/vasoepididymostomy	13, 2.5%
	Orchiopexy	9, 1.7%
Spinal	Greenlight laser photovaporization of prostate	26, 5.0%
	Inflatable penile prosthesis	25, 4.8%
Total		519

POD 5.6

Trends in emergency department management and wait times for urologic disorders in a publicly funded healthcare system: A retrospective, population-based cohort study in Ontario, Canada

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Introduction: Limited access to primary and specialist care has long been a shortcoming of Canadian healthcare. A lack of primary and specialist physicians and limited continuity of care are associated with increased use of the emergency department (ED). When patients do not have regular primary care access, we hypothesize that patients are seeking care for non-emergent urologic problems in the ED. Further, we hypothesize that patients are seeking care in the ED when they are unable to see a urologist in a timely fashion. Therefore, we sought to evaluate trends in the rate of ED visits and hospital admissions for urologic conditions in the single-payer, public healthcare system in Ontario. In addition, we aim to determine trends in wait times to see a urologist among patients presenting to the ED and the factors associated with ED visits and wait times.

Methods: We conducted a retrospective cohort study using health administrative data of adult patients presenting to the ED with a primary urologic diagnosis between January 1, 2007, and December 31, 2022. Patients were excluded if they had been previously seen by a urologist within two years or were pregnant. We estimated crude, age, and sex-standardized annual rates of index ED visits compared to the rate of visits for all other diagnoses, taking the first visit in each calendar year for each patient. We also determined the rate of admission following index ED visits. We determined the wait time to see a urologist after the ED visit if they were seen in six months. Annual rates of ED visits were estimated using Poisson regression, with a deviance scale adjustment to correct for overdispersion. Multivariate regression was performed to evaluate factors associated with hospital admission and time to see an outpatient urologist.

Results: We identified 2.19 million unique patients with at least one ED visit for a urologic diagnosis. Of these, 1.73 million patients presented to ED for a new urologic diagnosis (none in the previous two years), with a rising crude annual rate of ED visits (RR 1.02, 95% CI 1.02–1.02). When standardizing for age and sex, there was an annual rise in the rate of ED visits from 2007–2015 (RR 1.1, 95% CI 1.09–1.11), after which, the rate dropped until 2020 (RR 0.88, 95% CI 0.87–0.88) and rose again after this until 2022 (RR 0.91, 95% CI 0.9–0.91). Among patients seen in ED, 10.1% were admitted over the entire period, with a rising rate of admission annually (RR 1.04, 95% CI 1.03–1.05). The mean wait time to see a urologist after ER visit increased from 62.5 (SD 80.3) days in 2007 to 84.8 (SD 89.3) days in 2014. It subsequently decreased annually until 2022 to 71.1 (SD 70.6) days. The mean number of visits between the first ER visit and seeing a urologist increased from 1.23 (SD 0.54) in 2007 to 1.31 (SD 0.66) in 2022. Patients with greater continuity of outpatient care or those with an outpatient physician visit within six months of their ED visit had lower odds of being admitted at the time of their visit. Increased comorbidity was associated with lower risk of being seen by a urologist after ED visit.

Conclusions: The annual rate of patients visiting the ED for new urologic diagnosis in a public healthcare system has significantly increased over time, with rising rates of hospital admission. Wait times to see urologists have also increased over the same period. A rising burden of acute urologic disease necessitates additional investment in healthcare resources and efficient resource allocation.