

**The safety and efficacy of ambulatory urologic surgery: A paradigm shift towards optimizing resource utilization in outpatient settings**Dhiraj S. Bal<sup>1</sup>, David Chung<sup>2</sup>, Harliv Dhillon<sup>3</sup>, Maximilian Fidel<sup>1</sup>, Jainik Shah<sup>1</sup>, Alagarsamy Pandian<sup>3</sup>, Jasmir G. Nayak<sup>2,4</sup>, Premal Patel<sup>2,4</sup><sup>1</sup>Max Rady College of Medicine, University of Manitoba, Winnipeg, MB, Canada; <sup>2</sup>Section of Urology, Department of Surgery, University of Manitoba, Winnipeg, MB, Canada; <sup>3</sup>Department of Anesthesiology, University of Manitoba, Winnipeg, MB, Canada; <sup>4</sup>Men's Health Clinic Manitoba, Winnipeg, MB, Canada**Cite as:** Bal DS, Chung D, Dhillon H, et al. The safety and efficacy of ambulatory urologic surgery: A paradigm shift towards optimizing resource utilization in outpatient settings. *Can Urol Assoc J* 2024 July 15; Epub ahead of print. <http://dx.doi.org/10.5489/cuaj.8806>

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**ABSTRACT****Introduction:** Amidst substantial surgical waitlists, novel methods are needed to improve the delivery of surgical care in Canada. One strategy involves shifting select surgeries from hospitals into community ambulatory centers, which expedite procedures and allow hospitals to prioritize critical and complex patients. We sought to evaluate surgical outcomes at a novel Canadian urologic clinic and surgical center.**Methods:** A retrospective study was conducted at a novel accredited surgical facility and outpatient ambulatory clinic from August 2022 to August 2023. Procedures ranged from scrotal and transurethral surgeries to inflatable penile prosthesis insertion. Traditional outpatient procedures, including vasectomy and cystoscopy, were excluded. All patients were discharged the same day and seen 4–6 weeks post-procedure. Variables of interest included**KEY MESSAGES**

- This initial study involving 519 urologic outpatient surgeries demonstrated the safety and efficacy of performing select urologic procedures in an ambulatory setting.
- The absence of anesthesia-related complications, perioperative complications, or hospital admissions underscores the success of the outpatient approach in ensuring patient safety during urologic surgeries.
- Most patients did not seek medical care outside the clinic before their scheduled followup, indicating the effectiveness of postoperative care in the outpatient setting without placing an additional burden on the existing healthcare infrastructure.

surgery type, anesthesia administered, additional clinic appointments, unplanned family physician appointments, visits to the emergency department (ED), and hospital admissions.

**Results:** In a 12-month period, 519 surgeries were performed. The mean patient age was  $49.6 \pm 17.3$  years, with most classified as American Society of Anesthesiologists (ASA) 1–2 (88.8%). Most (95.8%,  $n=497$ ) patients did not require medical care outside the clinic before scheduled followup; 2.5% ( $n=13$ ) visited the ED presenting for wound concerns, postoperative pain, query infection, or catheter-related concerns. Only 1.7% ( $n=9$ ) required an unscheduled appointment with their family physician, with concerns being inadequate postoperative pain management ( $n=4$ ) or suspected infection ( $n=4$ ). No patient required hospital admission.

**Conclusions:** Many urologic surgeries classically performed in hospital operating rooms can be safely performed in a non-hospital, outpatient surgical facility with preservation of good outcomes. This strategy can potentially improve the efficiency of urologic healthcare delivery in select patients.

## INTRODUCTION

In response to the mounting challenges posed by lengthy surgical waitlists, there is a critical need for innovative strategies to optimize access and enhance the delivery of surgical care in Canada. The growing demand for timely interventions has catalyzed a paradigm shift in the healthcare landscape, compelling a re-evaluation of the traditional approach to urologic surgeries. One novel strategy involves the relocation of select urologic surgical procedures from hospital settings to community ambulatory surgical centers (ASCs). This transformative approach not only facilitates expeditious surgical intervention but also alleviates the strain on hospital resources, permitting a more concentrated focus on patients with intricate and critical medical needs in the hospital system.

In recent decades, ASCs have experienced a significant surge in popularity as an alternative to traditional hospital-based surgery and are notably prominent in the United States, where a majority of specific procedures occur in ASCs.<sup>1–3</sup> In contrast, in Canada, these procedures predominantly take place in large tertiary care hospitals.<sup>4</sup> The appeal of ASCs lies in various benefits, with cost savings being particularly pertinent to our healthcare system. Undeniable data indicates substantial economic benefits, reporting up to 50% cost savings for urologic surgery in ASCs.<sup>5,6</sup> Recent Saskatchewan Health data shows a 26% cost savings across various surgeries in ACSs, with the additional benefit of a 75% reduction in patients waiting over three months for intervention.<sup>7</sup> Existing literature underscores that urologic ASCs do not strain healthcare infrastructure, demonstrating comparable complication rates to traditional hospital settings. Importantly, the introduction of ASCs has not led to increased hospitalization or mortality rates.<sup>8</sup> A comprehensive audit of Canada's largest day surgery center corroborated these

findings, revealing minimal unplanned patient transfers and hospital admissions, emphasizing that ASCs do not contribute to an elevated burden on the existing healthcare infrastructure.<sup>9</sup>

Despite being a novel and appealing approach, a disparity exists in the literature concerning ASCs in Canada and their associated real-world outcomes. For example, classic endpoints include hospital admission rates, but in the real-world, unplanned visits to primary care physicians or emergency departments (without admission) are often under-reported yet still require the utilization of healthcare resources. In attempting to address this gap, our study aims to explore the safety and efficacy of ambulatory urologic surgery within a newly established outpatient surgical center.

## METHODS

A retrospective cohort study was conducted to evaluate peri- and post-operative outcomes at a novel, outpatient urologic surgical center – Men's Health Clinic Manitoba. This is an accredited surgical facility and outpatient ambulatory clinic for andrological, general urologic and urologic oncological conditions. Approval for this study was obtained from the University of Manitoba's Health and Research Ethics Board (HS26339). Between August of 2022 and August of 2023, all patients who underwent urologic surgery at the Men's Health Clinic Manitoba had their charts reviewed retrospectively to assess the following outcomes: patient age, body mass index (BMI), American Society of Anesthesiologists (ASA) classification, surgery type, anesthesia provider and anesthesia used, additional appointments required with a family medicine provider related to the procedure, emergency department (ED) visits related to the procedure, and instances of hospital admission to determine the burden placed on the existing healthcare infrastructure. Collected data was exported into a Microsoft Excel file (Microsoft Office, Microsoft Corporation, Redmond, WA), and basic descriptive analysis was performed.

## RESULTS

In a 12-month period between August 2022 to August 2023, over 2000 procedures were performed. After excluding common office-based procedures such as vasectomy and cystoscopy, a total of 519 urologic surgeries met the study criteria and were included in the analysis. The mean patient age  $\pm$  standard deviation was  $49.6 \pm 17.3$  years, and the mean BMI was  $28.6 \pm 5.5$  kg/m<sup>2</sup>. The majority of patients were classified as ASA class 2 (54.63%, n = 283), followed by ASA class 1 (34.15%, n = 177), and ASA class 3 (11.22%, n = 58). Table 1 provides an overview of the surgeries performed, which varied from scrotal and transurethral surgeries to inflatable penile prosthesis insertion with varying anesthetic approaches, including spinal anesthesia, intravenous sedation (administered by nursing staff or by anesthesiology), and local anesthesia only. All procedures were completed successfully, without peri-operative complications, anesthesia-related complications, procedural abortion due to intolerability, or transfer to hospital.

Only 1.73% (9/519) of patients had an unplanned family physician visit related to the procedure, with four patients presenting for pain control, four patients presenting for query infection, and one for constipation. 2.5% (13/519) of patients visited the ED prior to their

scheduled follow-up appointment, with three patients presenting for a wound assessment, query infection and inadequate pain control each, and two patients presenting for catheter issues and swelling each. No patient who underwent outpatient surgery required hospital admission. The remaining 95.8% (n = 497) of patients did not seek medical care outside of the clinic prior to their scheduled four-six-week post-operative follow-up appointment. 19.5% of patients (n = 101) required an additional clinic visit prior to their scheduled follow-up.

## DISCUSSION

Canada's already limited operating room resources have been further strained with the recent COVID-19 pandemic, resulting in a significant surgical backlog. ASCs have seen a dramatic increase in recent decades and are one potential solution to redistribute and alleviate the burden on an already overworked Canadian healthcare system. Men's Health Clinic Manitoba is a novel clinic, created by physicians, and is an ASC specializing in urology with a high volume of surgical output since its inception. Our study presents our 12-month initial experience at a highly specialized urologic ambulatory surgical centre to assess its safety and efficacy, as well as its effect on the public healthcare system.

Over 2000 procedures were completed at the Men's Health Clinic in the initial 12-month period. After excluding procedures completed in the outpatient setting as the current standard of care, including cystoscopy and vasectomies, 519 urologic surgeries were analyzed. A wide range of surgeries were completed successfully from multiple sub-specialties including andrology, functional, BPH, and oncology. Importantly, the procedures performed were those that would classically be performed in a hospital setting. Notably, no anesthetic-related complications nor any urgent transfers to a tertiary care hospital occurred. Similarly, low rates of transfer were seen at Canada's largest ASC in British Columbia, with a reported rate of 1.19%.<sup>9</sup> Although multiple specialties operated out of that centre, urologic surgery had an unplanned transfer rate of 1.0% while performing cases of similar complexity to our institution. At the Men's Health Clinic, a large number of penoscrotal cases are performed solely with local anesthetic, including cases that were traditionally performed in the operating room (i.e., hydrocelectomy, epididymectomy, etc.). Our group has also shown that this approach can be performed with excellent tolerability and safety, with post-operative outcomes that compare favourably to the published literature.<sup>10</sup> The low complication rates coupled with the good post-operative outcomes demonstrate that performing urologic surgery in an ambulatory centre away from a hospital or ED is safe and efficacious.

Surgical wait times have been a chronic problem that has long plagued the Canadian healthcare system for decades prior to the pandemic. With the COVID-19 pandemic, surgery for benign diseases was disproportionately affected, with a greater emphasis placed on maintaining the delivery of urgent/oncologic surgical care.<sup>11-13</sup> The implementation of ASCs provides an opportunity to transition cases suitable for the ambulatory setting while freeing up hospital resources for more complex and invasive cases. The US, in recent years, has seen a significant rise in urology ASCs while preserving the quality of care for patients.<sup>6</sup> Additionally, it can be

associated with significant cost savings, with one study citing a \$800-1800 reduction per urologic procedure.<sup>14</sup> It remains to be seen how these potential cost savings will translate in the Canadian landscape for urologic surgery, although Saskatchewan Health had reported a possible cost savings of 26% for procedures performed in an ASC.<sup>7</sup> For patients, there is a potential benefit by avoiding nosocomial infections associated with the hospital and the ability to recover in the comfort of their own home, which has been demonstrated to be preferred by patients themselves.<sup>15</sup>

Despite the obvious advantages of a urologic ASC, care must be taken to not only preserve the quality of patient care but to ensure that additional load is not being placed on the healthcare system. In our study, performing surgery in an outpatient ambulatory setting did not significantly contribute to the number of unscheduled family physician or ED visits, given the ability to manage post-operative concerns in our clinic setting. We intentionally included unscheduled family physician visits in our outcome measurements to offer a transparent view of the implications of performing surgery in a non-hospital setting. In fact, our rate of patients presenting to the ED for post-operative concerns was better than the published rates of 5-6% for return to hospital following surgery at an ambulatory centre.<sup>16-18</sup> 13 patients did require presentation to the ED for post-operative concerns, however, considering that an average of 5000 patients are seen in local emergency departments each week, we feel that this represents a very small and insignificant total.<sup>19</sup> Importantly, no patient required hospital admission, which is ultimately the crux of our healthcare system with limited hospital beds. The majority of research evaluating the effect of urology ASC on the public healthcare system comes from the US, where such centres are more prevalent. In the US, over a 10-year period, the significant rise in urology ASC and outpatient surgical procedures did not affect hospital admission rates.<sup>8</sup> Although ongoing audits of outcomes are necessary, we believe that implementation of a specialized urology ASC provides a significant net benefit to the Canadian healthcare system.

While our hospital admission rate was quite low, it is important to note that 19.5% of patients undergoing outpatient surgery required a visit to the clinic. The ability to have the urologic clinic facility and surgical centre in one place ensures that clinicians are always on-site and are available to address any peri-operative concerns. As such, we have the unique ability to provide reassurance or possibly rescue complications before they occur, which further alleviates any burdens on the healthcare system. In ambulatory centres without a clinic space, these short-notice follow-up appointments may be more difficult to manage.

### **Limitations**

Our study is not without limitations, the first of which would be its single-institutional nature. Although prolonged surgical wait times are an issue that affects the Canadian healthcare system as a whole, certain provinces, such as Ontario, with a higher number of urologists per capita, may be less affected. Therefore, our urology-specialized ASC model may not be as advantageous in such provinces. Additionally, no urgent transfer was required for anesthetic, or urgent surgical complications were seen in our cohort, although it is possible that this may have been due to a

high proportion of cases being performed under solely local anesthetic. Another limitation of our study is that our rate of presentation to the ED was likely ameliorated by the ability of patients to easily schedule semi-urgent follow-ups with our clinic for any issues that arise during their post-operative course, which is a unique advantage of having a combined clinic facility and ASC. Although this would need to be accounted for in a potential cost-benefit analysis, our study still demonstrates that over a one-year period, the presence of our urology ASC did not significantly add to the load of the public healthcare system.

The Men's Health Clinic Manitoba represents the first ASC specializing in urology/men's health in Canada and has played an integral role in providing quality and timely urologic care to Manitoba. It remains to be seen whether this model can be implemented in other Canadian jurisdictions to the degree it has been in the US or in other specialties. As ASCs in urology gain further popularity in Canada, further research is imperative to examine their effect on the traditional public healthcare system as well as evaluate surgical outcomes and potential cost savings.

## CONCLUSIONS

Our study describes the positive outcomes of urologic outpatient surgeries in an ambulatory setting. Over 12 months, 519 procedures across urologic specialties were successfully performed without significant complications, anesthesia-related issues, or hospital admissions. Most patients did not require additional medical care before scheduled follow-ups, demonstrating the effectiveness of outpatient care. Only a small percentage needed extra appointments or visited the ED, indicating minimal strain on existing healthcare infrastructure. This suggests that moving certain urologic surgeries to outpatient centers can improve healthcare efficiency, potentially addressing chronic challenges such as surgical waitlists in the Canadian system. As the first specialized urology ambulatory center in Canada, further research is necessary to assess broader impacts on public health, cost-effectiveness, and surgical outcomes for this model to become more widely disseminated.

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## FIGURES AND TABLES

<b>Anesthetic modality</b>	<b>Surgery</b>	<b>Patients (n, %)</b>
Local anesthesia	Scrotal surgery	153, 29.5%
	Hydrocelectomy	57, 11.0%
	Epididymectomy	42, 8.1%
	Spermatocectomy	36, 6.9%
	Testicular biopsy	18, 3.5%
	Circumcision	88, 17.0%
	Lesion excision (scrotal or penile)	27, 5.2%
IV sedation (nursing administered)	Dorsal slit/frenulectomy	22, 4.2%
	Penile plication	23, 4.4%
IV sedation (anesthesiologist administered)	Incision and grafting	2, 0.4%
	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%
Spinal anesthesia	Orchiopexy	9, 1.7%
	Greenlight laser photovaporization of prostate	26, 5.0%
	Inflatable penile prosthesis	25, 4.8%
	Total	519