

# *The laparoscopic experience of recently trained Canadian urologists*

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**Objective:** While laparoscopy represents an increasingly important aspect of operative urology, the experience of Canadian urology trainees is poorly defined. The purpose of this study was to determine the level of laparoscopic training of Canadian urology trainees during residency as well as their comfort level with various laparoscopic techniques.

**Methods:** An e-mail-and web-based questionnaire was administered to the two most recent cohorts of Canadian-trained urologists (residencies completed in 2003 or 2004). A total of 50 questionnaires were sent. Overall laparoscopic experience and experience with specific laparoscopic tasks (e.g. colonic mobilization) were assessed. Subjects also reported on their relative comfort level (Likert scale of 1 to 5) with various laparoscopic procedures and

tasks. Finally, attitudes towards the future role of laparoscopy in the practice of urology were determined.

**Results:** Thirty-six individuals (72%) responded to the questionnaire. Of the respondents, 28 (78%) were performing fellowships; of those pursuing fellowship training, 13 (36%) involved laparoscopy. Thirty-five respondents (97%) had received some laparoscopic exposure during residency; 29 (81%) had mobilized the colon, spleen or liver and 27 (75%) had dissected the renal vessels. Only 7 out of 33 respondents (21%) felt that their residency adequately prepared them to perform laparoscopy independently. There were no significant differences between the responses of the two cohorts.

**Conclusion:** Most Canadian urology trainees are being exposed to laparoscopy, but more exposure is required in order to perform laparoscopy in practice. Many residents still require fellowship training to become facile in laparoscopy.

**Key Words:** laparoscopy, residency training

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## Introduction

For urologists, laparoscopy is becoming an increasingly important skill. Laparoscopic radical nephrectomy is now recognized as a standard

approach to localized renal cell carcinoma<sup>1</sup> just as laparoscopic adrenalectomy is considered the standard for most benign adrenal lesions.<sup>2</sup> Many other urologic procedures, although not necessarily recognized as the gold-standard, are being performed laparoscopically with greater and greater frequency, including living donor nephrectomy,<sup>3</sup> nephroureterectomy for upper tract transitional cell carcinoma,<sup>4</sup> pyeloplasty,<sup>5</sup> radical prostatectomy,<sup>6</sup> and partial nephrectomy.<sup>7</sup> Since laparoscopy is now an established surgical approach, it is important to consider the effectiveness of

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TABLE 1. Demographics

	2003 Cohort	2004 Cohort	Total
Responders	19 (74%)	17 (65%)	36 (72%)
Pursuing fellowship	14 (74%)	14 (82%)	26 (78%)
Pursuing fellowship involving laparoscopy	9 (47%)	4 (24%)	13 (36%)
Residency Training Program			
University of British Columbia	2	2	4
University of Alberta	3	1	4
University of Manitoba	0	0	0
University of Western Ontario	2	2	4
Queen's University	1	0	1
University of Toronto	5	2	7
University of Ottawa	2	3	5
McGill University	2	3	5
University of Montreal	0	1	1
University of Laval	0	1	1
Dalhousie University	2	2	4

laparoscopic training during urologic residency. From post-residency questionnaires performed in the United States it appears that laparoscopic procedures are more likely to be performed by those who have received training during residency.<sup>8-10</sup> Despite these issues, the experience of recently trained Canadian urologists has remained poorly defined. The purpose of this study is to determine the laparoscopic exposure that Canadian urology trainees receive during their residency and their comfort level with various laparoscopic skills and procedures.

## Methods

An e-mail- (2003, n = 24) and web-based questionnaire (2004, n = 26) was sent to all individuals who had completed a Canadian urologic residency program in either 2003 or 2004 (total n=50). Those finishing in 2003 were e-mailed directly while questionnaires for the 2004 cohort were administered through a survey web-site ([www.hostedsurvey.com](http://www.hostedsurvey.com)). The questionnaire consisted of 63 items in total. The parameters assessed

included demographics; the number of various laparoscopic procedures performed both as a first assistant and as the primary surgeon; experience with specific laparoscopic tasks (e.g. organ mobilization, establishment of pneumoperitoneum); relative comfort level (Likert scale of 1 to 5) with various laparoscopic procedures and tasks and finally, attitude toward the future role of laparoscopy in urologic surgery.

## Results

Overall, 36 out of a total of 50 individuals responded to the survey for a response rate of 72%. The input from each cohort was evenly distributed, with 19/24 (74%) and 17/26 (65%) responding from the 2003 and 2004 cohorts respectively, Table 1. Out of the 36 responders, 28 (78%) were pursuing fellowships, 13 of which (36% overall) involved laparoscopy as the primary focus. Table 1 shows the distribution of responders; with the exception of one institution, all Canadian urology training programs were represented. Table 2 summarizes the experience

TABLE 2. Laparoscopic tasks performed

Task performed	2003 Cohort	2004 Cohort	Both
Any laparoscopic exposure	18 (94%)	17 (100%)	35 (97%)
Organ mobilization (colon, spleen, duodenum, liver)	14 (74%)	15 (88%)	29 (81%)
Renal vessel dissection	12 (63%)	15 (88%)	27 (75%)

responders reported in performing various laparoscopic tasks. Ninety-seven percent (35/36) of responders had had some exposure to laparoscopy during their residency. Eighty-one percent (29/36) of individuals had performed some degree of organ mobilization; more experience mobilizing the colon and spleen was reported compared with mobilization of the liver or duodenum. Seventy-five percent of responders reported performing renal vessel dissection. Finally, comfort with obtaining peritoneal access was assessed, Figure 1. The majority of individuals were comfortable with at least one form of access, whether it was with the Veress needle or the Hasson technique.

The survey also dealt with the specific number of various cases performed during training both as a first assistant and as the primary surgeon. Inquiry was made regarding open nephrectomies as well as a wide variety of laparoscopic cases. Open and laparoscopic nephrectomies were the most commonly performed procedures, Figures 2 and 3. The majority of responders reported doing 11 or more open nephrectomies as the primary surgeon. Experience with the laparoscopic approach was more limited with the majority of responders reporting 10 or less cases as the primary surgeon. Hand-assisted laparoscopic nephrectomy was evaluated separately. Most trainees reported performing no cases; four responders had done one to five hand-assisted laparoscopic nephrectomies as the primary surgeon and one individual had done six to ten.

The number of all other laparoscopic cases performed was rather limited; these included donor nephrectomy, partial nephrectomy, nephroureterectomy, pyeloplasty, renal cyst decortication, adrenalectomy, radical prostatectomy, pelvic lymph node dissection, varicocelelectomy and evaluation of cryptorchidism. As first assistants, the vast majority of responders were involved in 10 or less of each of these cases; nine individuals had assisted on 11 or more laparoscopic prostatectomies and one had assisted on 11 or more laparoscopic pelvic lymph node dissections. All responders had performed the above mentioned procedures less than five times as the primary surgeon, except for one individual who had done 6 to 10 laparoscopic prostatectomies and another who had performed 11 to 20 laparoscopic evaluations and treatments for cryptorchidism.

The final phase of the survey involved evaluation of the trainee's laparoscopic comfort level and their attitudes towards urologic laparoscopy. Figure 4 demonstrates comfort level with individual laparoscopic procedures. Laparoscopic nephrectomy

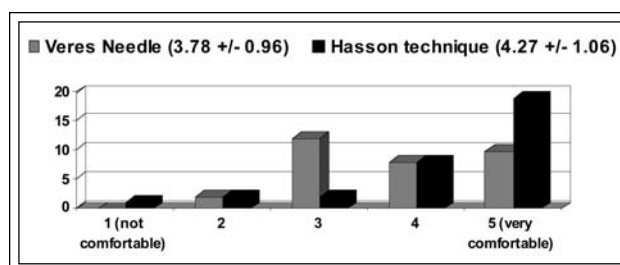


Figure 1. Comfort with obtaining peritoneal access.

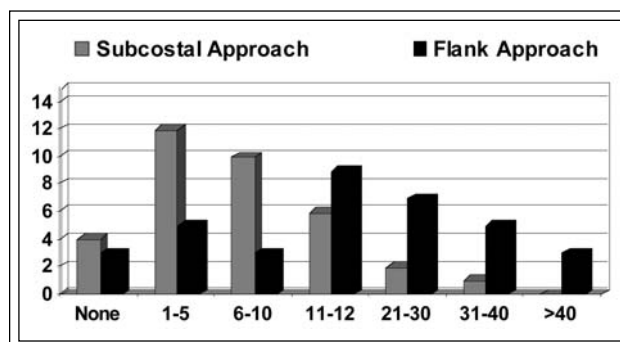


Figure 2. Open nephrectomies as primary surgeon.

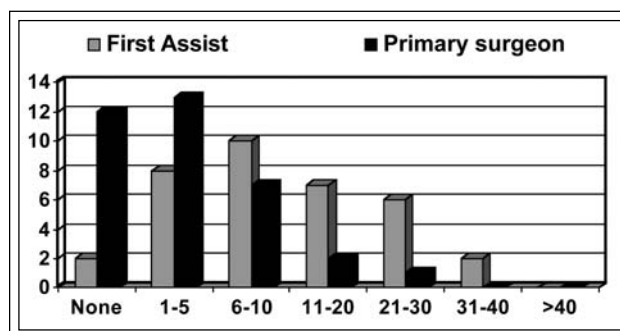


Figure 3. Laparoscopic nephrectomies performed.

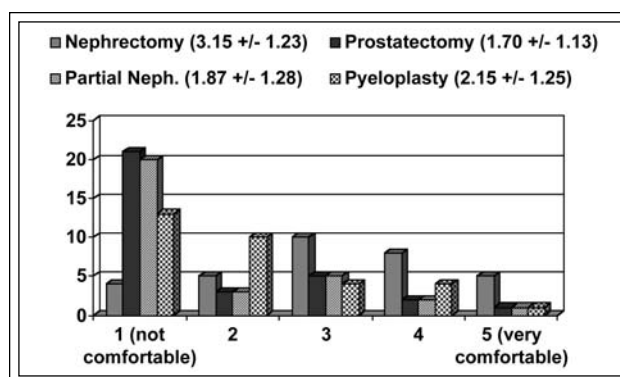
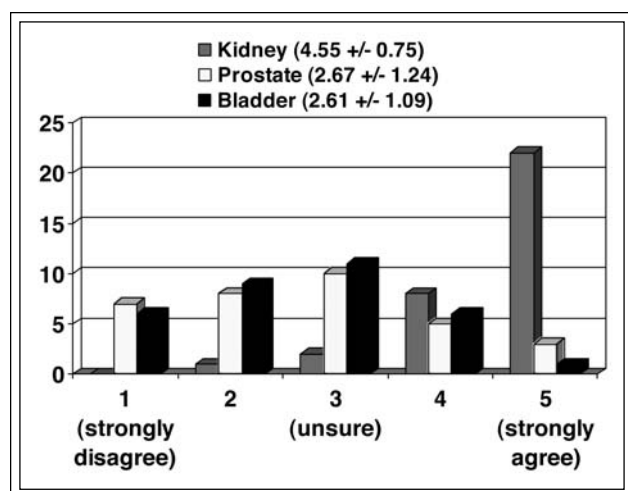


Figure 4. Comfort with laparoscopic procedures.

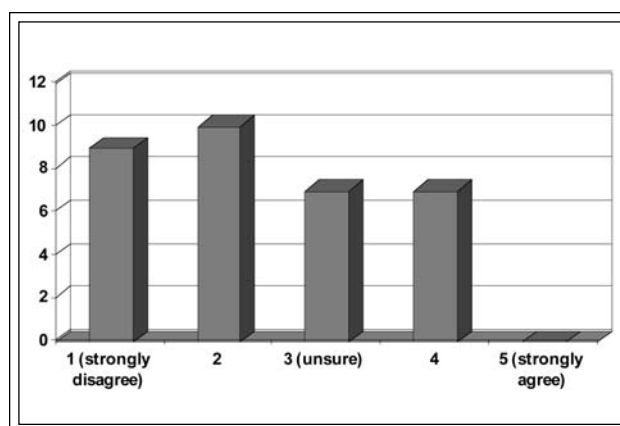


**Figure 5.** Response to: "In the future, most procedures on this organ will be performed laparoscopically".

was the procedure with which responders were most comfortable; aside from a few individuals, trainees were not comfortable with more advanced laparoscopic procedures. Figure 5 demonstrates the responder's attitude towards the future role of laparoscopy with respect to specific organs. In general, it was felt that most renal procedures would be performed laparoscopically, while the future role for this approach in bladder and prostate surgery was uncertain. Finally, responders were asked to evaluate the adequacy of their residency training in preparing them to perform urologic laparoscopic procedures, Figure 6. Only 21% (7/33) felt that their training was adequate in this respect.

## Discussion

Laparoscopy is becoming an increasingly important skill for urologists. Laparoscopic radical nephrectomy is now considered a standard therapy for localized renal cell carcinoma, providing equivalent cancer control and reduced morbidity.<sup>1</sup> Laparoscopic approaches offer significant improvements in post-operative recovery, morbidity and quality-of-life over open approaches for pyeloplasty,<sup>11</sup> nephrectomy<sup>12,13</sup> and adrenalectomy.<sup>2</sup> Minimally-invasive techniques can also be cost-saving: while cases may take longer in the operating room, substantially shorter lengths of stay and faster return of patients to work make laparoscopic procedures cheaper from a payer and societal perspective.<sup>14</sup> In addition, to date over 3000 laparoscopic prostatectomies have been reported in the literature since 1997 and the initial results, although relatively short-term, appear comparable to



**Figure 6.** Response to: "My residency adequately prepared me to perform laparoscopic procedures".

those of the open approach.<sup>6</sup> As mentioned previously, many other, more complex, urologic procedures are being performed laparoscopically with increasing frequency.

It appears that laparoscopic procedures are more likely to be performed by those who have received training during residency. Shay and colleagues surveyed 91 graduates from two institutions who finished their urology residencies between 1977 and 1999. They found that 69% of those who had had laparoscopic training during residency were performing laparoscopy in practice versus 34% without such training. This difference was statistically significant.<sup>8</sup> Another important issue is that many urologists trained in postgraduate courses do not go on to incorporate laparoscopic skills within their practice. Five years after a sponsored, 2-day postgraduate urologic laparoscopy course, only 53.6% of attendees were performing any laparoscopy.<sup>9</sup> Furthermore, 67% of surveyed urologists were not performing laparoscopy despite the fact that 60% of the survey group had taken at least one postgraduate laparoscopic course.<sup>10</sup>

Given the above information, we felt it important to define the laparoscopic experience of individuals completing Canadian urologic residency programs. Although the responder group was comprised of only 36 individuals, this did represent a response rate of 72%. Furthermore, the responders were well distributed from across the country thereby making the survey data representative of the experience and attitude of recent Canadian urologic trainees with respect to minimally-invasive surgery.

It is apparent that most Canadian urology residents are getting at least some basic laparoscopic training. Of those who responded, 97% reported some laparoscopic exposure and the majority were comfortable with

obtaining peritoneal access either with the Veress needle or Hasson techniques. Greater comfort with the open form of peritoneal access demonstrated in Figure 1 is likely a reflection of the practice pattern at the respective training programs. Most trainees (81%) had performed organ mobilization and nearly the same number (75%) had dissected the renal vessels. Despite this exposure the actual number of laparoscopic cases performed was relatively small. Not surprisingly, the most common laparoscopic case performed was laparoscopic nephrectomy. This was the case with which individuals had the greatest comfort compared to other minimally-invasive procedures, Figure 4. Most trainees had performed less than 10 nephrectomies via the laparoscopic approach, Figure 3, and had much more experience with the open technique. Once again, this likely reflects the practice pattern at the respective training institutions across the country. The individuals participating in this study would have started their residency training in 1998 or 1999, a time when the open approach to nephrectomy would have been more common. Reassuringly, this survey does demonstrate that these cohorts continue to have experience in open renal surgery, a skill which may rapidly decline as laparoscopy becomes the standard of care. This may lead a reversal in training challenges in the future: when laparoscopic nephrectomy becomes the standard approach in residency programs, trainees may have difficulty obtaining sufficient exposure to open cases to gain sufficient skills to be comfortable for more complex cases, or when urgent conversion is required. Finally, it should be noted that the determination of the number of cases performed in this study was limited by the fact that responders reported a range of cases performed rather than a specific number. In the future, this limitation may be alleviated by an ongoing project in Canada involving standardized electronic surgical logs for all urology residents (personal correspondence, A. MacNeily).

When inquiring about the attitude to the future role of urologic laparoscopy, 91% of responders felt that most renal procedures would eventually be performed through a minimally-invasive approach, Figure 5. On the other hand, there was less enthusiasm towards the future role of laparoscopic prostate and bladder surgery. This attitude likely reflects a number of factors. Most trainees would have had relatively little exposure to laparoscopic bladder and prostate procedures. Furthermore, these procedures have less general acceptance in the urologic community when compared with laparoscopic renal surgery. Finally, in Canada, consumer demand has less impact on surgical practice; this can result in less pressure

to adopt new surgical techniques before they demonstrate a clear clinical advantage.

Only 21% (7) of the 33 individuals who responded to the question regarding the adequacy of their laparoscopic training during residency agreed that that training was adequate, Figure 6. Thus, while most responders reported exposure to laparoscopy, they did not appear comfortable with their skills. This may explain why 36% of all responders to the survey went on to pursue laparoscopic fellowships; alternatively some of the individuals may have a genuine interest in pursuing an academic career in minimally-invasive surgery. Regardless of the reason, it is apparent that graduating urology residents in Canada are, on the whole, uncomfortable with laparoscopy and a large proportion is pursuing further training.

## Conclusions

Recent graduates of Canadian urology residency programs are performing basic laparoscopic tasks and a small number of laparoscopic cases as the primary surgeon. However, their exposure does not appear to be sufficient to allow them to comfortably perform laparoscopic cases independently. Certainly, as practice patterns change, residents will acquire more minimally-invasive surgical skills. We plan to continue to survey Canadian urology residents on an annual basis, and we hypothesize that resident exposure to and comfort with minimally-invasive techniques will expand as laparoscopic procedure become more widespread at Canadian teaching hospitals. One consequence of the increasing role of laparoscopy for renal surgery in the future may be that open nephrectomy volumes will decline, which may have an impact on the training of future urology residents in open renal surgery. Canadian residency training programs may want to explore other complimentary methods of surgical training in laparoscopy such as surgical simulators, laparoscopic training models, or animal laboratory experience with laparoscopy. While none of these modalities can replace actual operating experience, they can allow junior residents to develop basic skills and facility in laparoscopy prior to their arrival in the operating room. □

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