

Surgeon-specific factors affecting treatment decisions among Canadian urologists in the management of pT1a renal tumours

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Cite as: *Can Urol Assoc J* 2014;8(5-6):183-9. <http://dx.doi.org/10.5489/cuaj.1884>
Published online June 16, 2014.

Abstract

Introduction: The ubiquitous use of diagnostic imaging has resulted in an increased incidental detection of small renal masses (SRM). Patient- and tumour-related factors affect treatment decisions greatly; however, with multiple treatment options available, surgeon-specific characteristics and biases may also influence treatment recommendations. We determine the impact of surgeon-specific factors on treatment decisions in the management of SRM in Canada.

Methods: An online survey study was conducted among Canadian urologists currently registered with the Canadian Urological Association. The questionnaire collected demographic information and recommended treatments for 6 SRM index cases involving theoretical patients of various ages (51-80 years) and comorbidities.

Results: A total of 110 urologists responded (17% response rate) to the survey. Of these, 18% were over 65 years old and 45% were from academic centres. With increasing patient age and comorbidity, active surveillance and thermal ablative therapies were more the recommended treatment. Laparoscopic/robotic surgery was more commonly recommended by academic urologists and those under 65. Recommending surgery (radical nephrectomy or partial nephrectomy) for both elderly (about 80 years old) index patients correlated with surgeon age (surgeons over 65, $p < 0.001$), surgeons with no oncologic fellowship training ($p = 0.021$), surgeons with a non-academic practice ($p = 0.003$), surgeons with a personal history of cancer ($p = 0.038$) and surgeons with a family history of cancer death in the last 10 years ($p = 0.022$).

Conclusions: There are various factors that influence the management options offered to patients with SRMs. Our results suggest that surgeon age, personal history of cancer, practice-type and other surgeon-specific variables may affect treatments offered among urologists across Canada.

Introduction

The ubiquitous use of diagnostic imaging has resulted in an increased incidental detection of small renal masses (SRM).¹ Although not every SRM requires treatment, about 75% are malignant.²⁻⁴

Nephron-sparing surgery (NSS) has gained popularity over the last 2 decades,⁵ given the long-term morbidity and mortality associated with chronic renal insufficiency.⁶ Furthermore, partial nephrectomy (PN) has been shown to have excellent oncologic outcomes in the treatment of pT1a renal cell carcinomas (RCC).⁷⁻¹⁰ Utilization rates, however, have remained low for a variety of reasons.¹¹⁻¹³

Cryoablation, radiofrequency ablation (RFA) and active surveillance (AS) have become recognized, viable, nephron-sparing treatment options for clinical T1a RCC, especially in elderly patients and those with a higher surgical risk.¹³⁻¹⁵

While there are several evidence-based guidelines regarding the management of T1a RCC, many factors affect the ultimate treatment decision. To further aid clinicians with this often complex decision, scoring rubrics, such as the R.E.N.A.L. nephrometry and PADUA scores, have been developed to help predict the risk of surgical complications and postoperative renal function.¹⁶⁻²²

Despite these guidelines and scoring systems, a lack of consensus often exists among urologists when different treatment options are presented for the same patient. While much of the discussion may focus around patient and disease-specific factors, a variety of surgeon-specific factors may also influence treatment decisions.

Gaining a better understanding of the surgeon-specific factors that can affect treatment decisions in RCC in Canada will provide more insight into the current clinical paradigm and may improve patient care moving forward. As such, we conducted an online survey of Canadian urologists to assess these surgeon-specific factors.

Methods

Recruitment

Between March and May 2013, 3 e-mail blasts were sent to Canadian Urological Association (CUA) members, inviting them to participate in an online survey regarding the treatment of SRMs. All responses were de-identified and collected on the secure Survey Monkey website server. IP addresses were used to exclude repeat responses.

Survey

The survey consisted of two sections; the first involved the collection of respondent demographic information and the second included six index RCC cases (C1 to C6) of various ages and comorbidities (Table 1). All 6 cases involved patients with incidentally detected, biopsy confirmed, RCC measuring roughly 3 cm, with nephrometry score 4a. The patient's estimated GFR was also provided for each index case (Table 1).

For each case, respondents were asked to select, from a standardized list, their recommended management choice. Participants were also asked to select and rank 3 variables that most influenced their treatment decision (Table 2).

Statistical methods

Data was analyzed using SPSS software v. 21. Demographic and clinical practice details were correlated to recommended treatment options. Data were analyzed using Pearson and Spearman correlation for continuous and categorical data, respectively. McNemar's test was used to compare proportions between dependent groups and multivariable regression analysis was conducted to estimate any relationship between various factors.

Results

The e-mail blast was sent to 632 CUA members, with a 17% response rate (n = 110). The authors were personally contacted by 24 CUA members indicating that they were either retired or pediatric urologists, giving an adjusted response rate of 18% (110/608).

Demographics

Of the respondents, 90% (n = 99) were male and most had completed residency training in Canada (93%). Almost half (45%) were practicing in an academic setting and 18% were over 65. Most (63%) participants reported seeing RCC

Table 1. Case vignettes for the 6 cases in the survey

Case 1 (young and healthy)

A 51-year-old female presents to you with a 2.9-cm right upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally detected on an abdominal computed tomography (CT) scan. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no evidence of metastases and the patient has a normal left kidney, with a pre-treatment eGFR of 96 mL/min/1.73 m². The patient's past medical history is significant for hypothyroidism.

Case 2 (young with comorbid disease)

A 52-year-old male presents to you with a 3.0-cm left upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally detected on an abdominal CT scan. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no evidence of metastases and the patient has a normal right kidney, with a pre-treatment eGFR of 70 mL/min/1.73 m². The patient's past medical history is significant for hypertension, diabetes (non-insulin dependent) and gastroesophageal reflux disease.

Case 3 (older and healthy)

A 71-year-old female presents to you with a 2.8-cm left upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally identified by ultrasound. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no metastases and the patient has a normal right kidney, with a pre-treatment eGFR of 70 mL/min/1.73 m². The patient's past medical history is significant for gallstones and remote history of appendectomy and stress incontinence surgery.

Case 4 (older with comorbid disease)

A 70-year-old male presents to you with a 2.9-cm right upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally found on abdominal CT scan. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no metastases and the patient has a normal left kidney, with a pre-treatment eGFR of 57 mL/min/1.73 m². The patient's past medical history is significant for hypertension (well-controlled), diabetes (non-insulin dependent), migraines, and remote history of TURP for BPH.

Case 5 (elderly and healthy)

A 79-year-old male presents to you with a 3.1-cm right upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally found on ultrasonography. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no metastases and the patient has a normal left kidney, with a pre-treatment eGFR of 73 mL/min/1.73 m². The patient's past medical history is significant for BPH and remote appendectomy.

Case 6 (elderly with significant comorbid disease)

A 80-year-old male presents to you with a 3.0-cm right upper pole, anterior, renal mass with Nephrometry Score 4a (range 4-12), incidentally found on ultrasonography. A biopsy confirmed renal cell carcinoma, Fuhrman grade 2. Staging tests reveal no metastases and the patient has a normal left kidney, with a pre-treatment eGFR of 58 mL/min/1.73 m². The patient's medical history is significant for bilateral hip replacements, osteoarthritis, hypertension, renal stones, and COPD.

Table 2. Treatment options and variables affecting treatment choice

Participants were asked the following two questions after reading each case:

What initial treatment would YOU recommend for this patient? (please choose the ONE treatment that YOU would most strongly recommend at YOUR institution):

- o Active surveillance (AS)
- o Thermal ablative therapy (cryotherapy or radiofrequency ablation)
- o Laparoscopic/robotic radical nephrectomy (LRN)
- o Laparoscopic/robotic partial nephrectomy (LPN)
- o Open radical nephrectomy (ORN)
- o Open partial nephrectomy (OPN)
- o Oral systemic therapy

Rank the 3 variables that MOST influenced YOUR treatment choice (enter numerical text, 1 through 3).

- o Age of patient
- o Size of tumour
- o Grade of tumour
- o Nephrometry score (location, depth of invasion, etc)
- o Patient's past medical history
- o Patient's renal function
- o Natural history of disease
- o Availability of OR time
- o My surgical training/expertise
- o Access to (or lack thereof) ablative therapy

patients "often" or "almost daily;" only 5% reported seeing them "rarely" (Table 3).

Treatment choices

With increasing age and comorbidity, AS and thermal ablative therapies were more often selected as the recommended treatment option; 7%, 8%, 33%, 41%, 60%, 81% for index patients C1 to C6, respectively. Overall, NSS (particularly PN) was chosen by most respondents for C1 and C2, while few respondents selected surgical management (RN or PN) for C5 and C6 (Fig. 1).

When surgery was selected, an open surgical approach was more common for C5 and C6 as compared to C1 to C2 ($p < 0.05$), where a minimally invasive surgical (MIS) approach was preferred (Fig. 2).

Surgeon characteristics

Older age (>65) was weakly correlated with a non-academic practice ($p < 0.001$), a personal history of cancer ($p < 0.001$), and the use of an open surgical approach ($p < 0.013$ for all 6 cases). Similarly, academic urologists were more likely to be young (<65 , $p < 0.001$), have completed a clinical fellowship ($p < 0.001$), see more RCC patients ($p < 0.001$), and recommend MIS options for surgery ($p < 0.01$ for all 6 cases) (Table 4).

Table 3. Demographics

Characteristic	No. (%)
Age	
<35	9 (8.2)
35-44	47 (42.7)
45-54	26 (23.6)
55-64	8 (7.3)
65-74	17 (15.5)
≥ 75	3 (2.7)
Gender	
Male	99 (90.0)
Female	11 (10.0)
Current practice location	
British Columbia	17 (15.5)
Alberta	17 (15.5)
Saskatchewan	5 (4.5)
Manitoba	5 (4.5)
Ontario	50 (45.5)
Quebec	11 (10.0)
Newfoundland and Labrador	3 (2.7)
New Brunswick	2 (1.8)
Academic practice	
Yes	49 (44.5)
No	61 (55.5)
Fellowship training	
Any Fellowship	65 (59.1)
Oncologic Fellowship	23 (20.9)
No Fellowship Training	45 (40.9)
Participation in multidisciplinary "tumour board" rounds	
Yes	81 (75.0)
No	27 (25.0)
Frequency of renal cancer patients	
Almost Daily	21 (19.4)
Often	47 (43.5)
Occasionally	35 (32.4)
Rarely	5 (4.6)
Personal hereditary of cancer	
Yes	7 (6.4)
No	103 (93.6)
First degree relative died of cancer	
Yes	18 (16.4)
No	92 (83.6)

Recommending surgery (RN or PN) for both C5 and C6 (elderly patients) correlated with surgeon age (>65) ($p < 0.001$), no oncologic fellowship training ($p = 0.021$), a non-academic practice ($p = 0.003$), a personal history of cancer ($p = 0.038$) and a family history of cancer death in the last 10 years ($p = 0.022$) (Table 5). On multivariable analysis, only age >65 ($p = 0.043$) and the lack of oncology fellowship training ($p = 0.039$) correlated with surgical management for both patients C5 and C6.

Variables influencing treatment decisions

For cases C5 and C6, age was the most commonly ranked influential variable among those who **did not** choose sur-

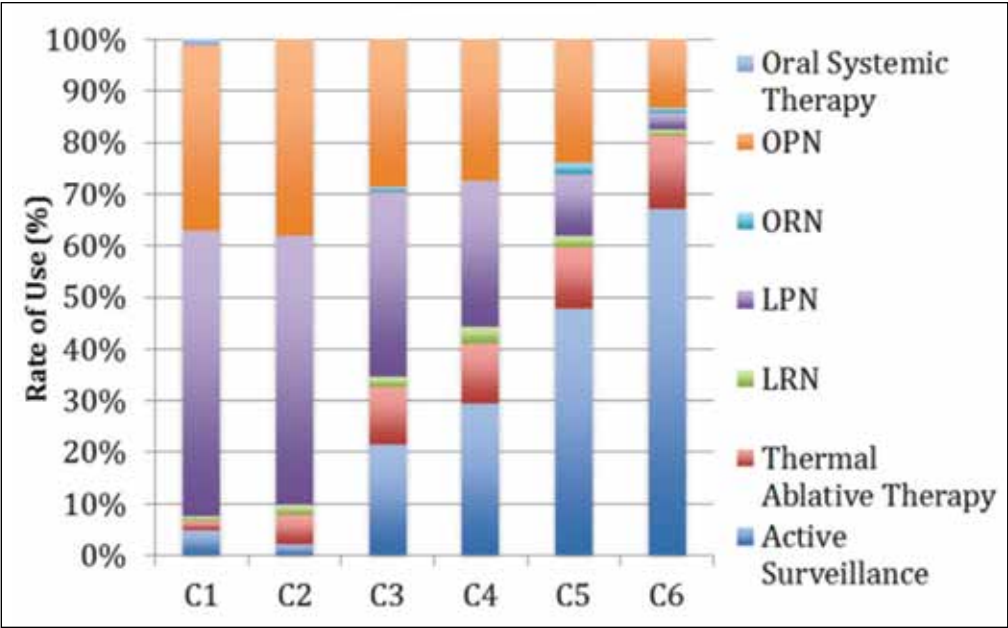


Fig. 1. Treatment choice by index case

gical treatment (66% and 74%, respectively) and among respondents <65 years of age (72% and 75%, respectively). Conversely, age was **not** one of the top 3 influential variables ranked by respondents >65 years of age and those that **did** recommend surgical treatment for C5 and C6; personal training/experience was the most commonly ranked influential variable by respondents recommending surgery for both C5 and C6 (59% and 65%, respectively) (Table 6).

patient-related factors as well.²⁵⁻²⁶ Surgeon-specific factors may also have a significant impact on this decision-making process, though such variables are often not explicitly understood by the patient.

This online survey study of Canadian urologists provides further evidence of an emerging paradigm shift away from the traditional gold standard RN for RCC. As comparable oncologic safety evidence emerges,⁹⁻¹⁰ and training and expertise in advanced MIS techniques permeate the specialty, many urologists have embraced elective NSS as a safe and efficacious option.

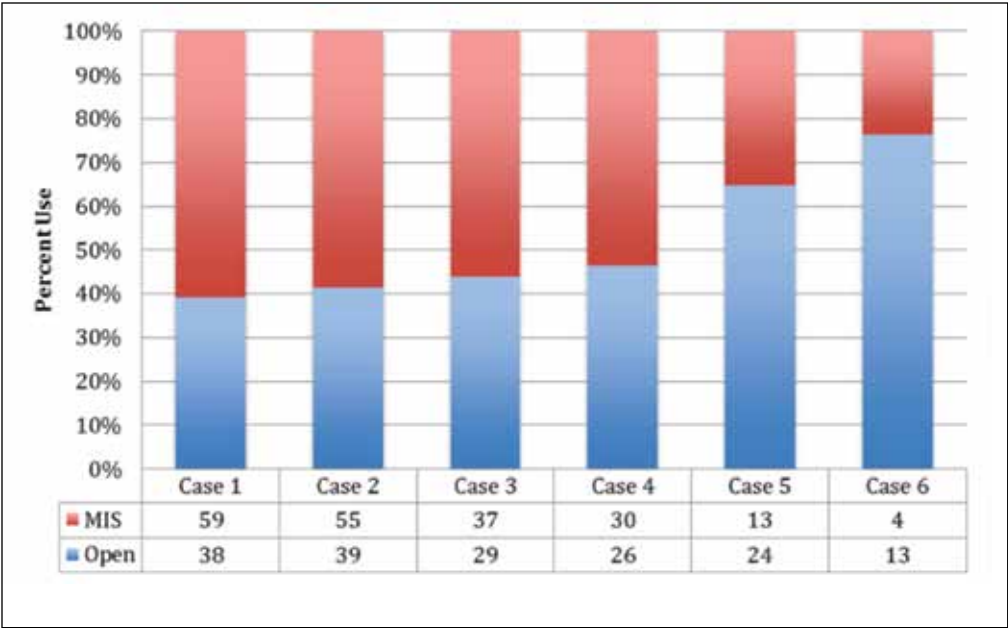


Fig. 2. Minimally invasive versus open surgery in cases being treated surgically. MIS: minimally invasive surgery; Open: open surgery. *statistically significant difference compared to C1 and C2 ($p < 0.05$).

Discussion

Contemporary management options for patients with RCC have dramatically increased, perhaps due to increasing concerns regarding surgically-induced renal dysfunction,^{6,23} but also as a result of the introduction of innovative surgical technologies. In fact, there is no longer a single gold standard option for RCC (i.e., open radical nephrectomy),²⁴ particularly for pT1a tumours.

Ultimately, when deciding on a “best” option, urologists attempt to balance the competing risks associated with different treatment options, taking into consideration not only disease-specific factors but

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With emerging evidence regarding its safety, the role of AS for small RCCs has also increased.²⁷⁻³³ In this study, AS was recommended by 21% of urologists for C3, 30% for C4, 48% for C5, and 67% for C6.

Table 4. Significant correlations between demographic characteristics

Correlation	r / ρ	p value
Age (>65 years):		
Non-academic practice	0.342	<0.01
Working with trainees	-0.316	<0.01
Clinical fellowship	-0.349	<0.01
Larger catchment area of practice	-0.269	<0.01
Personal history of cancer	0.442	<0.01
Academic urologists:		
Age >65 years	-0.342	<0.01
Working with trainees	0.834	<0.01
Clinical fellowship	0.560	<0.01
Larger catchment area of practice	0.456	<0.01
More likely to see RCC patients	0.365	<0.01
Less likely to have first degree relative who died of cancer	0.199	0.04
Having completed an Oncology Fellowship:		
Non-academic practice	-0.439	<0.01
More likely to see RCC patients	0.364	<0.01

RCC: renal cell carcinoma.

Interestingly, 5% of urologists offered AS to patient C1. Thermal ablation was relatively uncommon, with at most only 14% (C6) of urologists recommending this option.

Index patients C5 and C6 were about 80 years old, close to the current average life expectancy in Canada.³⁴ Particularly for patient C6 (multiple medical comorbidities), either AS or thermal ablation, could be reasonable, safe options. Conversely, for the same patient, it could be argued that PN and RN are somewhat “aggressive” management options given the high surgical risk. We examined

the treatment options for C5 and C6, with the assumption that surgical management (RN and PN) was considered an “aggressive” option.

We found that only 34% and 16% of urologists would recommend such an “aggressive” treatment option for C5 and C6, respectively. Interestingly, urologists were more likely to offer such “aggressive” options if they themselves were >65 years of age, practicing in non-academic settings, without oncology fellowship training, and with either a personal history of cancer or whom had a first-degree relative die of cancer within the past 10 years. Among those recommending RN or PN, respondents did not consider patient age in their decision-making process; age was not one of the 3 most important considerations in selecting the optimal management option.

From the methodology of this survey, we are unable to discern the exact reasons why older urologists and those with either a personal or family history of cancer would be more likely to select a more aggressive treatment option for elderly patients with SRMs. However, among the respondents in this study, urologists >65 years of age were less likely to have completed an oncology fellowship and were more commonly from non-academic practices, perhaps indicating a knowledge translation issue.

Also, though not well-studied, ageism in health care is an all too prevalent phenomenon.³⁵⁻³⁶ With increasing life expectancies and innovative MIS treatment options, age alone should not be an exclusionary criterion for treating patients with RCC. Among respondents, older urologists

Table 5. Variables affecting treatment decisions in Case 5 and Case 6

Surgeon characteristic (no. respondents)	Case no.: Top 3 variables	No. respondents (%)
Recommended aggressive treatment (surgery) for C5 & C6 (n=17)	Case 5: Personal training/experience	10 (59%)
	Medical history	8 (47%)
	Patient's renal function	8 (47%)
	Case 6: Personal training/experience	11 (65%)
	Patient's renal function	10 (59%)
	Tumour size	7 (41%)
Did NOT recommend aggressive treatment (surgery) for both C5 & C6 (n=93)	Case 5: Age	61 (66%)
	Tumour size	58 (62%)
	Natural history	32 (34%)
	Case 6: Age	69 (74%)
	Medical history	46 (49%)
	Tumour size	42 (45%)
Age >65 years (n=21)	Case 5: Medical history	12 (57%)
	Patient's renal function	12 (57%)
	Natural history	7 (33%)
	Case 6: Patient's renal function	13 (62%)
	Medical history	11 (52%)
	Natural history	10 (48%)
Age <65 years (n=89)	Case 5: Age	64 (74%)
	Tumour size	60 (67%)
	Natural History	29 (33%)
	Case 6: Age	67 (75%)
	Tumour size	47 (53%)
	Medical history	40 (45%)

Table 6. Variables affecting treatment decisions in Case 5 and Case 6

Surgeon characteristic (no. respondents)	Case no.: Top 3 variables	No. respondents (%)
Recommended aggressive treatment (surgery) for C5 & C6 (n=17)	Case 5: Personal training/experience	10 (59%)
	Medical history	8 (47%)
	Patient's renal function	8 (47%)
	Case 6: Personal training/experience	11 (65%)
	Patient's renal function	10 (59%)
	Tumour size	7 (41%)
Did NOT recommend aggressive treatment (surgery) for both C5 & C6 (n=93)	Case 5: Age	61 (66%)
	Tumour size	58 (62%)
	Natural history	32 (34%)
	Case 6: Age	69 (74%)
	Medical history	46 (49%)
	Tumour size	42 (45%)
Age >65 years (n=21)	Case 5: Medical history	12 (57%)
	Patient's renal function	12 (57%)
	Natural history	7 (33%)
	Case 6: Patient's renal function	13 (62%)
	Medical history	11 (52%)
	Natural history	10 (48%)
Age <65 years (n=89)	Case 5: Age	64 (74%)
	Tumour size	60 (67%)
	Natural History	29 (33%)
	Case 6: Age	67 (75%)
	Tumour size	47 (53%)
	Medical history	40 (45%)

were more likely to offer “aggressive” treatment options to elderly patients (C5 and C6). One could hypothesize that either this is evidence that younger surgeons display an affinity to ageist practices or, conversely, that older surgeons are more apt to offer “aggressive” treatment options to their own generational cohort. Interestingly, for index patients C3 and C4 (both about 70), urologist age did not correlate with a decision to offer surgical management ($p = 0.538$).

Our survey demonstrates that with increasing patient age, comorbidities, and renal dysfunction, Canadian urologists are likely to offer AS or NSS to patients with pT1a RCC. In addition, the reported utilization of MIS techniques for the management of T1a RCC in Canada seems to be increasing compared to recent population-based observational data.³⁷ Both age of surgeon and practice setting seem to play a role in determining not only whether MIS techniques are utilized, but whether surgical options are offered in select index patients.

A similar study of American Urological Association (AUA) members in 2009 also found that various surgeon-factors (surgeon age, practice location, higher renal case volume) significantly influenced the use of PN.¹¹ While this study also examined surgeon-specific variables, the authors focused more on tumour characteristics within a set of healthy index patients. In a related publication, however, the same authors presented the results of the full survey that included index cases of variable ages, renal function, and comorbidities.³⁸ Interestingly, although there were slight differences between index patients in this study and ours (e.g., 3 cm vs. 2-4 cm),

similar management patterns were seen for patients with comparable age, renal function, and comorbidity. Notable differences among our Canadian respondents included an increased use of AS among healthier patients, an overall lower rate of RN among comparable patients, and a lower reported utilization of thermal ablation in Canada. These differences might be explained by the litigious nature of American healthcare system, the time interval between survey studies, and the prohibitive cost of ablation therapy in Canada.

There are several limitations to our study. First, as with many physician survey studies, our response rate was low (18%). Unfortunately, we were unable to direct our email blast to only the practicing, adult urologists in Canada. As such, the 110 respondents may in fact represent a larger proportion of the valid audience. Secondly, almost half (45%) of respondents were practicing in an academic setting, which represents an oversampling of this subgroup of urologists. Also, while statistically significant, many of our correlations were weak (i.e., correlation coefficient <0.5). As with all survey studies, the results may have had inherent social desirability biases as well. Finally, as this study was solely solicited via email, there may be deficiencies in its completeness; we may not have reached all urologists.

Conclusion

There are various disease-specific and patient-related factors that affect the decision-making process when manag-

ing patients with pT1a RCC in Canada. Our online survey study of CUA member urologists demonstrates that surgeon-specific factors may also significantly influence treatment decisions and should be considered when offering patients treatment options.

Competing interests: Dr. Millman, Dr. Pace, Dr. Ordon and Dr. Lee all declare no competing financial or personal interests.

This paper has been peer-reviewed.

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