

**Analgesic prescribing habits and patterns of Canadian chief urology residents: A national survey**

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**Abstract**

**Introduction:** Prior studies have identified significant knowledge gaps in acute and chronic pain management among graduating urology residents as of five years ago. Since then, there has been increasing awareness of the impact of excessive opioid prescribing on long-term narcotic use and development of adverse narcotic-related events. However, it is unclear whether the attitudes and experience of graduating urology residents have changed. We set out to evaluate the attitudes and experience of graduating urology residents in prescribing opioid/non-opioid analgesia for acute (AP), chronic non-cancer (CnC), and chronic cancer (CC) pain.

**Methods:** Graduating urology residents were surveyed at a review course in 2018. The survey consisted of open-ended and close-ended five-point Likert scale questions. Descriptive statistics, Mann-Whitney U-test, and Student's t-test were performed.

**Results:** A total of 32 PGY5 urology residents completed our survey (92% response rate). The vast majority agreed that formal training in managing AP/CnC/CC to be valuable (91/78/81%). Most find their training in CnC/CC management to be inadequate and are unaware of any opioid prescribing guidelines; 66% never counsel patients on how to dispose of excess opioids. In general, 88% are comfortable prescribing opioids, whereas most are very uncomfortable prescribing cannabis or antidepressants (100%/78%). Residents reported the Acute Pain Service as the highest-rated resource for information, and dedicated textbooks the least.

**Conclusions:** This survey demonstrated that experience in pain management remains variable among urology residents. Knowledge gaps remain, particularly in the management of chronic cancer/non-cancer pain.

## Introduction

The “opioid crisis” in Canada, primarily a result of opioid over-prescribing, continues to exert its toll on public health.<sup>1-4</sup> There has been over 8000 opioid-related deaths between January 2016 and September 2018, the most of which (>90%) were accidental.<sup>3,5</sup> At the center of this crisis is the excessive prescribing of opioids; a 140% increase in defined daily doses of opioids dispensed was recorded in the two-year period of 2013-15 compared to 2003-05.<sup>3,6,7</sup> Moreover, Canadians are not only prescribed more opioids, they’re also increasingly prescribed stronger opioids; 57.3% of opioids prescribed in 2016 are strong opioids (fentanyl, hydromorphone, morphine, and oxycodone), compared to 52.2% in 2012.<sup>8</sup>

In addition to pain and palliative care specialists, surgeons are among the highest prescribers of opioids; in the US, surgeons prescribe 10% of all opioids dispensed.<sup>9,10</sup> Various US studies have shown that as high as 70% of post-operatively prescribed opioids are not used, making them available for potential misuse or abuse.<sup>10-19</sup> Moreover, patients rarely dispose of unused opioids.<sup>20</sup> In addition to post-operative pain, surgeons prescribe opioids for the management of chronic cancer and non-cancer pain. Urologists, in particular, manage chronic non-cancer pains such as chronic prostatitis/chronic pelvic syndrome, interstitial cystitis, chronic epididymitis, and orchiodynia, in addition to chronic cancer-related pain, acute renal colic pain, and pain occurring in an acute surgical setting.<sup>21-24</sup>

Similar to other surgical specialties, most opioid prescriptions written in academic centres are written by urologists in training, highlighting the importance of an in-depth understanding of pain management options.<sup>23-26</sup> However, studies involving medical oncologists and surgeons demonstrated clear knowledge gaps.<sup>24,27,28</sup> A recent survey of US surgical program directors found that only 20% of training programs have mandatory opioid prescribing education as part of their curriculum.<sup>26,29</sup> Moreover, in a 2013 survey of Canadian urology chief residents, Pace *et al* found a significant difference of training experience in chronic and acute pain management, and poor apparent knowledge of opioid prescribing.<sup>24</sup>

Since 2013, there has been increasing awareness of the impact of excessive opioid prescribing on long-term narcotic use and development of adverse-narcotic related events. However, it is unclear whether the attitudes and experience of graduating urology residents have changed. With the increasing number of opioid-related deaths, and the shift towards a competency-based graduate medical education, we hypothesize that insight into these habits and patterns would offer a deeper understanding of the quality and type of education Canadian urology residents are provided, and prove highly beneficial in facilitating the development of educational curricula.<sup>30</sup>

For this reason, we set out to evaluate the attitudes and experience of graduating urology residents in prescribing opioid/non-opioid analgesia for acute (AP), chronic non-cancer (CnC) and chronic cancer (CC) pain.

## Methods

Ethics approval was obtained from Queen's University institutional review board. 35 postgraduate year-5 (PGY-5) urology residents from training programs across Canada, participating in the annual Queen's Urology Exam Skills Test (QUEST) course, were invited to participate in this voluntary study. Primary and secondary outcomes of the survey were communicated to all invitees. Invitees were informed that participation and responses will not impact their academic standing or their performance in the review course.

The study employed a confidential and anonymous paper survey comprised of open and close-ended questions (Appendix A). Residents were asked about their confidence, experience, and formal training in the management of acute and chronic pain as measured by a 5-point Likert scale. In addition, they were asked about resources most often used, and the complimentary services most often engaged. Moreover, respondents were presented with three hypothetical cases (AP, CC, and CnC; Appendix A) and asked to fill an appropriate prescription.

Descriptive statistics was used to describe the data. Average Likert scores and standard deviations were calculated for all close-ended questions. In addition, an agreeableness score (percentage of participants selecting 4 or 5 on a 5-point Likert scale) were calculated. Written opioid prescriptions were analyzed and normalized to Morphine Equivalents per Day and compared on such basis. Moreover, statistical analysis involved Mann-Whitney U test, student's t-test, Pearson's Chi-squared test, or Fisher's exact test, as applicable.

## Results

35 PGY-5 urology residents participating in QUEST were invited to complete our survey; 32 responses were collected, resulting in a response rate of 92%. Fig. 1 summarizes the reported confidence, training and experience respondents have in managing different types of pain. Although only 63% report receiving formal training in the management of AP (mean Likert score  $3.34 \pm 1.05$  SD), most of the respondents (81%;  $3.97 \pm 0.85$ ) agree that their training in the managing of AP is adequate. On the other hand, only 19% ( $2.50 \pm 0.83$ ;  $p < 0.0001$ ) and 22% ( $2.53 \pm 0.93$ ;  $p < 0.0001$ ) of the residents thought their training in managing CnC and CC, respectively, was adequate. This is in line with only 31% ( $2.75 \pm 1.0$ ;  $2.69 \pm 0.95$ ) reporting receiving formal training in the management of CnC and CC, respectively. Interestingly, the majority of respondents agree that formal training in the management of AP, CnC, and CC is very valuable.

In a similar fashion to the 2013 study by Pace *et al*, residents were asked to rank the resources they most often use in pain management (Fig. 2).<sup>24</sup> Similar to previous studies, our results indicate that the acute pain service (APMS) and fellow trainees rank among the highest of values resources. On the other hand, guidelines and textbooks ranked among the lowest. In fact, only 19% are aware of any guidelines for the management of AP, and even fewer are aware of any guidelines for the management of CC (9%) or CnC (6%).

When asked about confidence in prescribing different drug modalities (

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Fig. 3), the majority report comfort in prescribing acetaminophen, NSAIDs, and opioids. On the contrary, only 38% ( $3.16 \pm 1.00$ ) agree that they're comfortable prescribing gabapentinoids. Even fewer (3%;  $2.16 \pm 0.83$ ) feel confident prescribing muscle relaxants and none of the respondents feel comfortable prescribing antidepressants or medicinal marijuana ( $1.75 \pm 0.79$  and  $1.28 \pm 0.45$ , respectively). 45% ( $3.16 \pm 1.25$ ) indicated regularly engaging complimentary services for pain control, with palliative care and acute pain service being the two most frequently consulted services (63% and 53%, respectively).

The residents were presented with three hypothetical cases and asked to write appropriate prescriptions and list the most pertinent issues they would counsel on (

Fig. 4). Scripts for the AP case had a median of 2.5 drugs, with 72% containing an NSAID, followed by  $\alpha$ -blockers (63%), and opioids (56%). The three items most often counseled for on an AP script were constipation, dizziness, and gastrointestinal (GI) bleeds (69%, 34%, and 34%, respectively). Greater variability was seen in the CnC scripts, where the most common drug class prescribed was NSAIDs (38% of prescriptions). Tricyclic antidepressants, acetaminophen, and opioids appeared in similar frequencies (29%, 25%, and 21%, respectively). Constipation and GI bleeds were again the items most counseled for (29% each), followed by drowsiness (17%). CnC prescriptions had a median of 1 drug/script. CC scripts had the highest frequency of opioid prescriptions, with 91% of respondents prescribing some form of opioid, followed by acetaminophen and a laxative (31% and 28%, respectively). 88% of respondents listed constipation as an item for counselling; interestingly, addiction was only mentioned by 25% of respondents, following drowsiness (28%). When asked explicitly, 85% of respondents said they never or seldom counsel for proper opioid disposal. Moreover, in order to facilitate comparison, all opioid prescriptions were normalized to Morphine Equivalents per day (

Fig. 5). Not only were opioids prescribed more often for CC, the amount of opioid prescribed ( $50 \pm 29$  mg/day) was significantly greater than that of AP scripts ( $35 \pm 26$  mg/day;  $p = 0.032$ ) and CnC scripts ( $8 \pm 18$  mg/day;  $p < 0.00001$ ).

## Discussion

In the United States alone, more than 130 people die every day from overdosing on opioids.<sup>31</sup> Liberal prescribing of opioids by well-meaning physicians has had a significant role in this crisis through misuse and diversion.<sup>32</sup> More recently, there has been increasing awareness of the harms of medical prescribing of opioids, which has brought the issue of pain management to the forefront for all health practitioners, including urologists. A 2013 survey of Canadian chief Urology residents identified a knowledge gap in managing different types of pain, and recommended an increased focus on pain management during residency education.<sup>24</sup> Our results show that despite increasing awareness of this issue, little has changed over 5 years in the attitudes and experience of Canadian urology residents regarding pain management.

Although the vast majority of residents agreed that formal training in pain management was important, it represents a disproportionately small percentage of the curriculum in urological postgraduate education according to this survey. When probed about educational resources used for pain management, the most commonly cited resource remained the acute pain service. The involvement of acute pain services may represent a double-edged sword, as surgical residents can learn passively from suggestions of the consulting service but may have their active involvement in acute pain management diminish. Encouragingly, since 2013, residents reported a greater dependence on online resources, which makes for more active, albeit informal, learning. Interestingly, though residents reported comfort in prescribing a variety of analgesic agents, many indicated a lack of confidence particularly in prescribing gabapentinoids and TCAs, which have become common adjuncts to the traditional opioid and NSAID pain regimes in the inpatient and outpatient setting.

Unsurprisingly, residents reported less comfort managing chronic cancer and non-cancer pain. Although chronic cancer and non-cancer pain are less commonly dealt with by urologists, there remain several conditions in which urologists may be called upon to prescribe pain medications in these settings. Our index patient for chronic cancer pain in our survey was a patient with metastatic prostate cancer. The urologist is often the primary specialist involved with caring for these patients. This may lead to urologists taking a more central role in pain management in this setting. Our index patient with chronic non-cancer pain, was a patient with interstitial cystitis bladder pain syndrome. This represents another condition that is commonly managed by the urologist, in which experience with chronic non-cancer pain management may be useful.

Since the time of publication of the 2013 survey, various pain management guidelines have been published, with the Canadian Guideline for Opioids for Non-Cancer Pain being one of the

more recent ones.<sup>33–37</sup> Despite that, very few residents were aware of any guidelines; in fact, guidelines ranked as one of the least-employed resource among residents. Although most respondents prescribed opioids for CC pain, only 25% of them mentioned addiction as an item they'd counsel on, and most indicated never/seldomly counselling on opioid disposal. This is problematic as diversion is common; the nonmedical use of prescription opioids among US adults was 4.9% in 2013.<sup>37</sup>

Our results show that pain management should become a formal component of the academic curriculum for urology residents, complimenting the current experiential-based approach. This would help ensure that future consultants are confident to manage these often complex problems. Recognizing the importance of pain management training, the 2019 Accreditation Council for Graduate Medical Education (ACGME) program requirements for Graduate Medical Education in Urology now contain specific items requiring programs to provide instruction and experience in pain management, with a focus on signs of addiction (requirement IV.C.2).<sup>38</sup>

This study has several limitations inherent to a study design involving a survey of a captured audience. This survey focused on urologist and clinical scenarios within this specialty, and hence, results may not extrapolate to other subspecialties. However, similar knowledge gaps have been identified in other specialties and other countries.<sup>39–41</sup> Secondly, this survey represents only a snapshot of self-reported attitudes and experience of pain management within their training. However, these residents were chosen close to completion of their training to ensure that they had experienced all rotations and educational curricula set out by their respective programs. Thirdly, this was a somewhat small sample size. However, the response rate of the residents and the consistency of responses throughout the survey attests to the robustness of the results and interpretation.

### **Conclusions**

This survey demonstrated that experience in pain management remains variable among urology residents. Formal training in pain management remains a disproportionately small percentage of post-graduate urology training. Although residents reported adequate experience in managing AP, reported confidence in management of chronic cancer and non-cancer pain as well as comfort using a variety of analgesic agents was low. Resources used remain mostly unchanged from 2013, apart from greater dependence on online resources.

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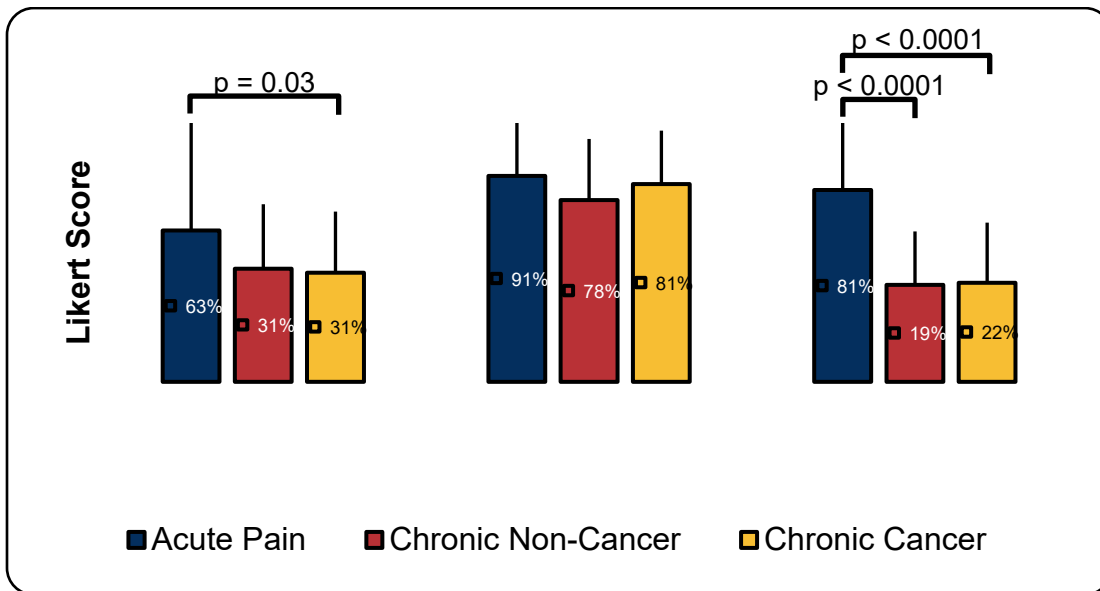
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Figures and Tables

**Fig. 1.** Reported overall comfort and experience in managing acute pain, chronic non-cancer pain, and chronic cancer.



**Fig. 2.** Educational resources used. Box and whisker plot (mean, 95% confidence limit) of ranking scores.

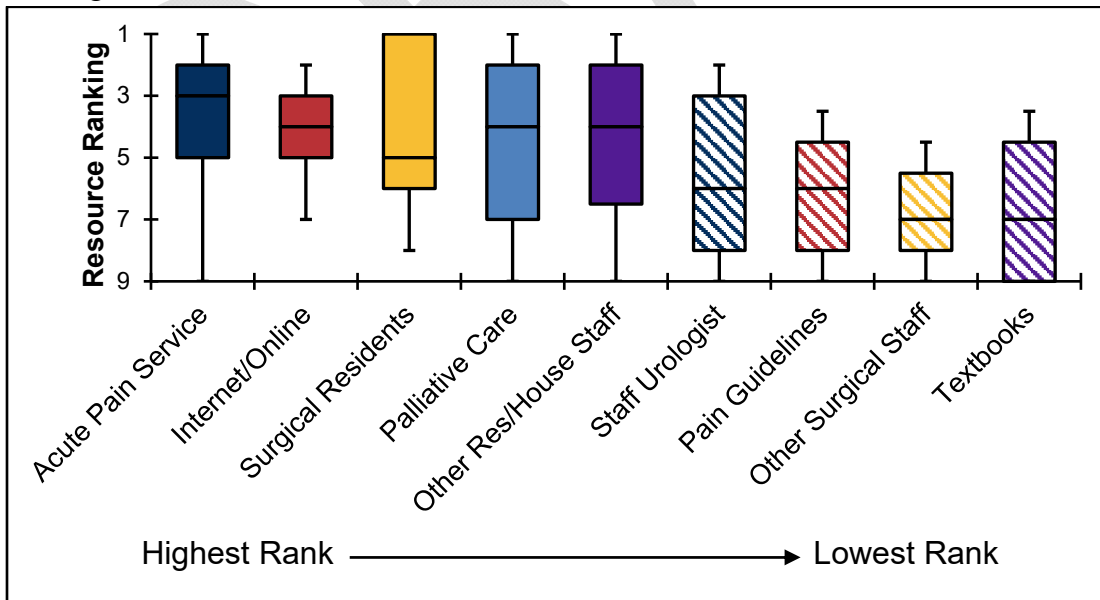


Fig. 3. Reported comfort level prescribing different drug modalities.

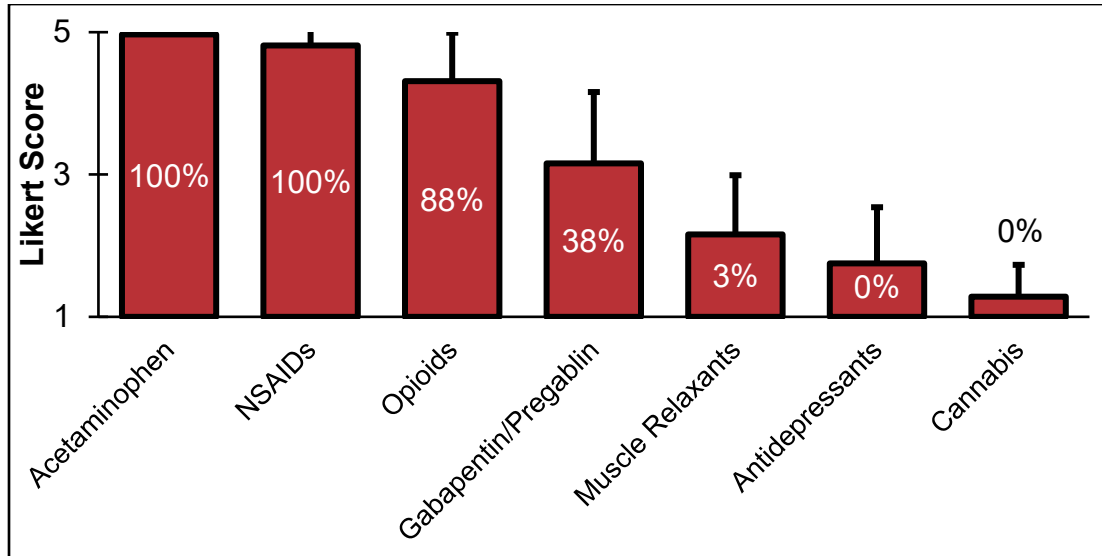


Fig. 4. Breakdown of hand-filled prescriptions.

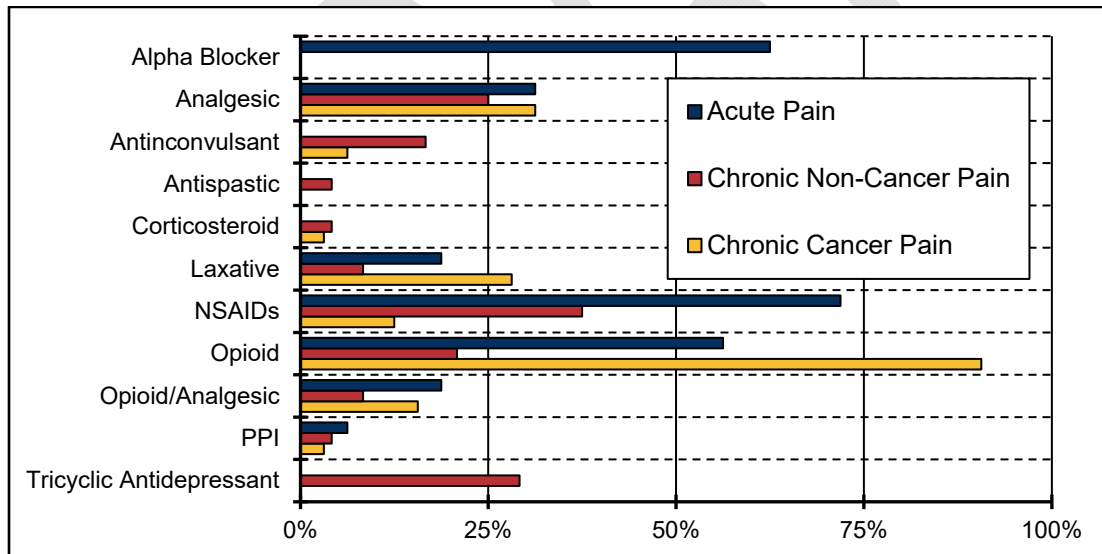
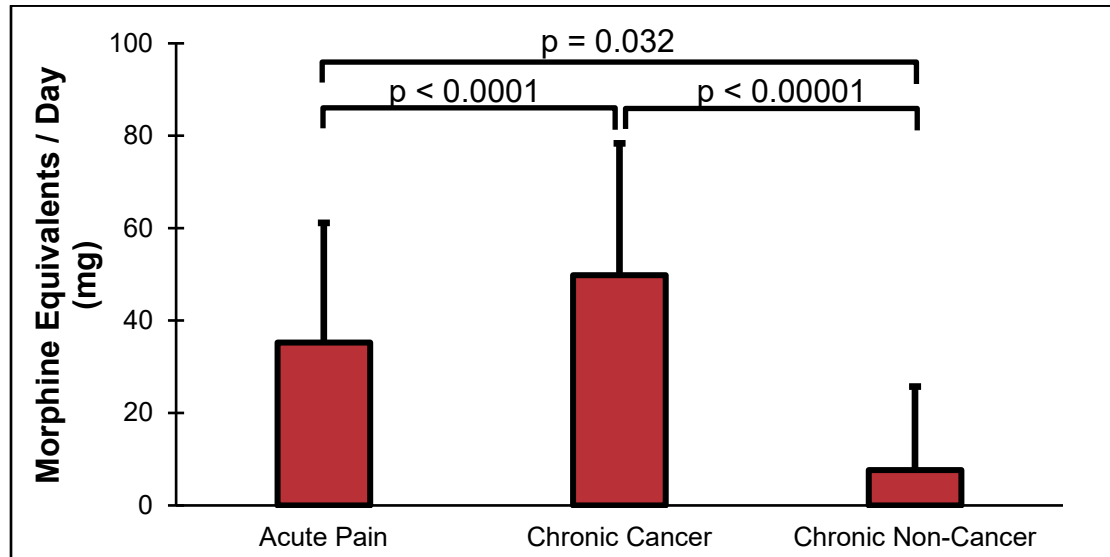


Fig. 5. Amount of opioid dispensed per prescription.



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**Appendix A. Analgesic prescribing habits and patterns of Canadian urology residents**

*Primary Investigators: D. Robert Siemens, MD, FRCSC; Thomas McGregor, MD, FRCSC*

Dear QUEST participant,

We invite to complete the following survey dealing with analgesic prescribing habits and patterns of Canadian urology residents. We hope that our findings would offer a deeper understanding of the quality and type of education Canadian urology residents are provided and prove highly beneficial in curricula development.

Your participation in this survey is completely voluntary and anonymous. Completing this survey, or not, will have no impact on your academic standing. Moreover, we're collecting no identifying data aside from region of Canada currently training in (Western, Central, Eastern). The survey results will be by the investigators, and possibly by Research Ethics Board representatives for auditing and quality assurance purposes.

For ethics concerns, please contact the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board. Call 1-844-535-2988 (toll free in North America) or email the HSREB Chair at: [clarkaf@queensu.ca](mailto:clarkaf@queensu.ca).

Thank you for your participation,

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**Analgesic prescribing habits and patterns of Canadian urology residents**

This voluntary and anonymous survey aims to gain insight into the pain management strategies and prescribing habits of Canadian urology residents. We hope that this would offer a deeper understanding of the quality and type of education Canadian urology residents are provided and prove highly beneficial in curricula development. We're collecting no identifying data aside from region of Canada currently training in (Western, Central, Eastern).

\* Required

1. **What year of residency are you in? \***

*Mark only one oval.*

- PGY1  
 PGY2  
 PGY3  
 PGY4  
 PGY5  
 PGY6+

2. **In which area are you currently completing your residency?**

*Mark only one oval.*

- West (BC, AB, SK)  
 Central (MB, ON)  
 East (QC, NB, NL, NS, PE)  
 USA  
 International

3. **During my residency training, I have received formal training/teaching in the following:**

\*

*Mark only one circle per row.*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. **Within Urology, formal training in management of the following would be/is very valuable: \***

*Mark only one circle per row.*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. **I feel my training (formal or informal) and experience in managing the following to be adequate: \***

*Mark only one circle per row.*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. **I am aware of peer reviewed opioid prescribing guidelines for the management of: \***

*Mark only one circle per row.*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. **Please rank the following people/services that were the greatest resource for your education in pain management (1: highest, 9: lowest) \***

**Rank**

Acute Pain Service (Anesthesiologist)
Internet/Online Resources



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Dedicated Textbooks
Staff Urologist
Other Surgical Staff
Surgical Residents
Pain Guidelines
Palliative Care Service
Other Residents/House-staff

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**For each of the following cases, please write a prescription for the medication(s) you would typically give for symptom management in each scenario. Please write the prescription in the same style/format you would typically use in a real-life scenario.**

A 35-year-old healthy male assessed in the emergency room and found to have a 4 mm left mid-ureteric stone and 7/10 pain. Vital signs are stable, renal function is normal and there are no signs of infection. They wish to try to pass the stone at home.

<b>R</b>	DATE _____
----------	------------

8. **Please list the TOP THREE (3) issues/side effects/concerns that you'd counsel the above patient on regarding their prescription: \***

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

A 70-year-old man with CRPC presents with several painful symptomatic bone mets. He is awaiting appointments with radiation oncology and medical oncology. Please write a prescription for pain management for this patient.

<b>R</b>	DATE _____
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9. Please list the TOP THREE (3) issues/side effects/concerns that you'd counsel the above patient on regarding their prescription: \*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

A 45-year-old women with interstitial cystitis bladder pain syndrome refractory to elmiron, mirabegron, intra-vesical DMSO presents with significant chronic pelvic discomfort. She describes the pain as 8 out of 10 and is requesting a medication(s) to ease the discomfort.

R	DATE _____
---	------------

10. Please list the TOP THREE (3) issues/side effects/concerns that you'd counsel the above patient on regarding their prescription: \*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

## 11. How often do you promote alternative, non-narcotic methods for the control of: \*

*Mark only one circle per row.*

	Never	Seldom	About Half the Time	Usually	Always
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List the various alternatives you would advise the patient to use :					

## 12. How often is medical marijuana prescribed AT YOUR INSTITUTION for the control of: \*

*Mark only one circle per row.*

	Not Sure	Never	Seldom	About Half the Time	Usually	Always
Acute Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Non-Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic Cancer Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 13. How often do you engage complimentary services for pain control? \*

*Mark only one circle.*

	1	2	3	4	5	Always
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 14. What are the complimentary services often engaged at your institution? \*

1. \_\_\_\_\_

2. \_\_\_\_\_

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 3.
 

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15. **How often do you counsel your patients on how to properly dispose of excess opioids? \***  
*Mark only one circle.*

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

16. **How comfortable are you in prescribing each of the following pain medications: \***  
*Mark only one circle per row.*

	Very Uncomfortable	Uncomfortable	Neutral	Comfortable	Very Comfortable
Antidepressants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muscle Relaxants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acetaminophen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NSAIDs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gabapentin/Pregablin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cannabis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opioids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>