

# A tale of two cities: Divergent management of patients with ureteral colic

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## INTRODUCTION

In this issue of *CJEM*, Innes and colleagues present an intriguing study that compares the management of patients with renal colic presenting to the emergency departments (EDs) of the municipal health authorities of Calgary and Vancouver.<sup>1</sup> Based on 3,283 patients from the calendar year 2014 with a first diagnosis of a ureteral stone confirmed by computed tomography (CT) or ultrasound imaging, they found stark differences between the two locations. Patients in Calgary (60.9%) were nearly twice as likely as their counterparts in Vancouver (31.3%) to require hospitalization and/or urological intervention within a 60-day follow-up period, which was the primary outcome of the study. Even more striking was the difference between rates of index interventions, defined as procedures, such as stent placement and/or ureteroscopy and laser lithotripsy during the initial ED visit, which were 52.1% and 7.5% in Calgary and Vancouver, respectively. This would mean that the approximately 1000-km journey from the coastal seaport in British Columbia to the foothills of the Canadian Rockies in Alberta increases a patient's risk for upfront urological intervention nearly sevenfold (relatively speaking) and by 50% in absolute terms. Additional information is provided in an analysis stratified by stone size, which is a well-established predictor of stone passage as derived from the control arms of randomized controlled trials of medical expulsive therapy (MET).<sup>2,3</sup> In the recent trial by Meltzer and colleagues, which stands out for having been conducted in a similar healthcare setting that included routine CT-imaging both in making the initial diagnosis and for subsequent follow-up, the average stone size was

3.8 mm, and the spontaneous stone passage rate in the placebo group was 47%.<sup>4</sup> The clinical practice guideline of the Canadian Urological Association (CUA) states that 95% of ureteral stones of 2 to 4 mm in size will pass spontaneously.<sup>5</sup>

The first question that we should ask is: Can we believe the study results? The authors make a laudable effort at identifying the key limitations of their study design, which include the focus on population-level outcomes and the lack of more granular patient-level clinical information such as details about post discharge pain management or the use of MET. They are also transparent in pointing out that the generalizability of their findings is limited to patients with a well-defined ureteral stone and a 60-day time-horizon. However, despite these limitations and relatively minor differences in the baseline characteristics of patients presenting at these two sites, the answer to this question is a qualified "yes." Indeed, differences of such magnitude are unlikely to be explained by issues of confounding alone and may in fact strengthen our confidence in the observed association being true.<sup>6</sup>

What do these findings mean? Such dramatic variations in clinical care represent the type of observations that have motivated the Dartmouth Atlas of Health Care to document similar variations in medical resource distribution and use in the United States.<sup>7</sup> They have also provided the impetus for the development of evidence-based clinical practice guidelines, which aim to reduce large variations in patient care that are unexplained by differences in patient characteristics or values and preferences.<sup>8</sup>

The most applicable guideline to a Canadian patient presenting with renal colic is that, from the CUA,

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which states that patients with stones < 5 mm in size in the distal ureter "...are appropriate for an attempt of conservative management...".<sup>5</sup> Guidelines of the American Urological Association make a "strong recommendation" that "patients with uncomplicated ureteral stones  $\leq$  10 mm should be offered observation, and those with distal ureteral stones of similar size should be offered medical expulsive therapy with alpha-blockers."<sup>9</sup> A recent "Rapid Recommendation" based on the recent Cochrane review on MET using rigorous guideline methodology has also recommended a trial of alpha-blockers ("conditional recommendation for") in patients with an uncomplicated ureteral stone, even if the diagnosis is not confirmed by imaging.<sup>2,10</sup>

The high rates of primary intervention in patients with uncomplicated ureteral stones in Calgary suggest overtreatment as well as likely overutilization of scarce healthcare resources. The importance of these findings is further underscored by the observation that these patients subsequently experienced more, rather than fewer return visits to the ED and hospital readmissions. We can only speculate about the underlying reasons, which may include a tradition of early intervention in the urological community, patient expectations, operating-room access policies that facilitate and favor urgent over elective procedures, and a reimbursement structure that may have created misaligned incentives to deviate from guideline-concordant care. Many of these patients may in fact not require urological consultation because their likelihood of spontaneous stone passage is so high, and urology over-consultation on the part of the ED staff as well as associated expectations with regards to the ensuing patient management may be a contributor to overtreatment. Regardless of the underlying forces, which deserve further investigation, it behooves us all to put current best evidence into practice, especially in settings where high quality guidelines exist to guide us.

**Keywords:** medical expulsive therapy, surgical intervention, ureteral colic, urology

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## REFERENCES

1. Innes G, McRae A, Grafstein E, et al. Variability of renal colic management and outcomes in two Canadian cities. *CJEM* 2018; epub, doi:[10.1017/cem.2018.31](https://doi.org/10.1017/cem.2018.31).
2. Campschroer T, Zhu X, Vernooij RW, et al. Alpha-blockers as medical expulsive therapy for ureteral stones. *Cochrane Database Syst Rev* 2018;4:CD008509; epub, doi:[10.1002/14651858.CD008509.pub3](https://doi.org/10.1002/14651858.CD008509.pub3).
3. Hollingsworth JM, Canales BK, Rogers MA, et al. Alpha blockers for treatment of ureteric stones: systematic review and meta-analysis. *BMJ* 2016;355:i6112; epub, doi:[10.1136/bmj.i6112](https://doi.org/10.1136/bmj.i6112).
4. Meltzer AC, Burrows PK, Wolfson AB, et al. Effect of tamsulosin on passage of symptomatic ureteral stones: a randomized clinical trial. *JAMA Intern Med* 2018; 178(8):1051-7; doi:[10.1001/jamainternmed.2018.2259](https://doi.org/10.1001/jamainternmed.2018.2259).
5. Ordon M, Andonian S, Blew B, et al. CUA guideline: management of ureteral calculi. *Can Urol Assoc J* 2015;9(11-12):E837-51; doi:[10.5489/cuaj.3483](https://doi.org/10.5489/cuaj.3483).
6. Guyatt GH, Oxman AD, Sultan S, et al. GRADE guidelines: 9. Rating up the quality of evidence. *J Clin Epidemiol* 2011;64(12):1311-6; doi:[10.1016/j.jclinepi.2011.06.004](https://doi.org/10.1016/j.jclinepi.2011.06.004).
7. Baker LC, Bundorf MK, Kessler DP. Patients' preferences explain a small but significant share of regional variation in medicare spending. *Health Aff (Millwood)* 2014;33(6):957-63; doi:[10.1377/hlthaff.2013.1184](https://doi.org/10.1377/hlthaff.2013.1184).
8. Institute of Medicine (U.S.). *Committee on Standards for Developing Trustworthy Clinical Practice Guidelines, Graham R. Clinical practice guidelines we can trust.* Washington, DC: National Academies Press; 2011.
9. Assimos D, Krambeck A, Miller NL, et al. Surgical management of stones: American Urological Association/Endourological Society Guideline, PART I. *J Urol* 2016;196(4):1153-60; doi:[10.1016/j.juro.2016.05.090](https://doi.org/10.1016/j.juro.2016.05.090).
10. Vermandere M, Kuijpers T, Burgers JS, et al. Alpha-blockers for uncomplicated ureteral stones: a clinical practice guideline. *BJU Int* 2018; epub, doi:[10.1111/bju.14457](https://doi.org/10.1111/bju.14457).