APPENDIX

Supplementary Table 1. Characteristics of renal colic, gross hematuria, and acute urinary retention patients presenting to the ED stratified by year of ED visit and summarized for individual urological presentations (tallied as ED visits unless indicated otherwise)

Characteristic	Full sample	2008–2009	2018–2019	Change	p
Renal colic					
ED visits	1386	248	1138	+890 visits	
Unique patients†	1216	242	974	+732 patients	
Mean age in years (SD)	48.5 (17)	47.7 (15.5)	48.7 (17.3)	+1.0 years	0.41
Median age in years (min, max)	47.9 (15.4, 96.4)	47.7 (15.4, 93)	48.0 (17.2, 96.4)	+0.3 years	
Gender					0.46
Female	472 (34.1%)	79 (31.9%)	393 (34.5%)	+2.7%	
Male	914 (65.9%)	169 (68.1%)	745 (65.5%)	-2.7%	
Season					0.87
Spring	420 (30.3%)	75 (30.2%)	345 (30.3%)	+0.1%	
Summer	464 (33.5%)	87 (35.1%)	377 (33.1%)	-2.0%	
Fall	255 (18.4%)	46 (18.5%)	209 (18.4%)	-0.2%	
Winter	247 (17.8%)	40 (16.1%)	207 (18.2%)	+2.1%	
Borough					0.0043*
Downtown Toronto	387 (27.9%)	59 (23.8%)	328 (28.8%)	+5.0	
Central Toronto	122 (8.8%)	16 (6.5%)	106 (9.3%)	+2.9%	
East Toronto	23 (1.7%)	3 (1.2%)	20 (1.8%)	+0.5%	
West Toronto	289 (20.9%)	63 (25.4%)	226 (19.9%)	-5.5%	
North York	64 (4.6%)	14 (5.6%)	50 (4.4%)	-1.3%	
East York	29 (2.1%)	7 (2.8%)	22 (1.9%)	-0.9%	
York	163 (11.8%)	40 (16.1%)	123 (10.8%)	-5.3%	
Etobicoke	52 (3.8%)	15 (6%)	37 (3.3%)	-2.8%	
Scarborough	44 (3.2%)	4 (1.6%)	40 (3.5%)	+1.9%	
Other	213 (15.4%)	27 (10.9%)	186 (16.3%)	+5.5%	
Downtown core					0.02*
Within core	509 (36.7%)	75 (30.2%)	434 (38.1%)	+7.9%	
Outside core	877 (63.3%)	173 (69.8%)	704 (61.9%)	-7.9%	
Gross hematuria					
ED visits	1072	370	702	+332 visits	
Unique patients†	886	318	568	+250 patients	
Mean age in years (SD)	67.4 (18)	66.3 (19.2)	67.9 (17.4)	+1.6 years	0.15
Median age in years (min, max)	71.4 (18.1, 101.9)	70.6 (18.1, 96.1)	71.6 (18.7, 101.9)	+1.0 years	
Gender					0.39

Female	226 (21.1%)	72 (19.5%)	154 (21.9%)	+2.4%	
Male	846 (78.9%)	298 (80.5%)	548 (78.1%)	-2.4%	
Season					0.31
Spring	307 (28.6%)	97 (26.2%)	210 (29.9%)	+3.7%	
Summer	400 (37.3%)	152 (41.1%)	248 (35.3%)	-5.8%	
Fall	191 (17.8%)	64 (17.3%)	127 (18.1%)	+0.8%	
Winter	174 (16.2%)	57 (15.4%)	117 (16.7%)	+1.3%	
Borough					0.71
Downtown Toronto	287 (26.8%)	96 (25.9%)	191 (27.2%)	+1.3%	
Central Toronto	114 (10.6%)	43 (11.6%)	71 (10.1%)	-1.5%	
East Toronto	26 (2.4%)	8 (2.2%)	18 (2.6%)	+0.4%	
West Toronto	150 (14%)	47 (12.7%)	103 (14.7%)	+2.0%	
North York	103 (9.6%)	42 (11.4%)	61 (8.7%)	-2.7%	
East York	28 (2.6%)	9 (2.4%)	19 (2.7%)	+0.3%	
York	83 (7.7%)	34 (9.2%)	49 (7%)	-2.2%	
Etobicoke	78 (7.3%)	27 (7.3%)	51 (7.3%)	0.0%	
Scarborough	35 (3.3%)	9 (2.4%)	26 (3.7%)	+1.3%	
Other	168 (15.7%)	55 (14.9%)	113 (16.1%)	+1.2%	
Downtown core					0.95
Within core	401 (37.4%)	139 (37.6%)	262 (37.3%)	-0.3%	
Outside core	671 (62.6%)	231 (62.4%)	440 (62.7%)	+0.3%	
Acute urinary retention					
ED visits	1052	373	679	+306 visits	
Unique patients[†]	797	305	492	+187 patients	
Mean age in years (SD)	70.3 (13.7)	68.9 (13.6)	71.1 (13.8)	+2.2 years	0.017*
Median age in years (min, max)	71.7 (18.2, 101.9)	70.2 (21.4, 97.7)	72.5 (18.2, 101.9)	+2.3 years	
Gender				-2.8%	0.15
Female	100 (9.5%)	42 (11.3%)	58 (8.5%)	+2.8%	
Male	952 (90.5%)	331 (88.7%)	621 (91.5%)		
Season					0.93
Spring	306 (29.1%)	112 (30%)	194 (28.6%)	-1.5%	
Summer	365 (34.7%)	129 (34.6%)	236 (34.8%)	+0.2%	
Fall	196 (18.6%)	66 (17.7%)	130 (19.1%)	+1.5%	
Winter	185 (17.6%)	66 (17.7%)	119 (17.5%)	-0.2%	
Borough					0.062
Downtown Toronto	274 (26%)	101 (27.1%)	173 (25.5%)	-1.6%	
Central Toronto	143 (13.6%)	38 (10.2%)	105 (15.5%)	+5.3%	
East Toronto	35 (3.3%)	10 (2.7%)	25 (3.7%)	+1.0%	
West Toronto	186 (17.7%)	59 (15.8%)	127 (18.7%)	+2.9%	
North York	76 (7.2%)	24 (6.4%)	52 (7.7%)	+1.2%	
East York	13 (1.2%)	6 (1.6%)	7 (1%)	-0.6%	
York	130 (12.4%)	59 (15.8%)	71 (10.5%)	-5.4%	
Etobicoke	60 (5.7%)	27 (7.2%)	33 (4.9%)	-2.4%	
Scarborough	24 (2.3%)	9 (2.4%)	15 (2.2%)	-0.2%	
Other	111 (10.6%)	40 (10.7%)	71 (10.5%)	-0.3%	

Downtown core					0.26
Within core	417 (39.6%)	139 (37.3%)	278 (40.9%)	+3.7%	
Outside core	635 (60.4%)	234 (62.7%)	401 (59.1%)	-3.7%	

†Patients who visited the ED on separate occasions with a different urological presentation were counted as unique patients in each cohort relevant to the presentation; however, within cohorts, patients were counted only once regardless of the number of times they visited the ED with the same presentation.
*Significant difference between 2008–2009 and 2018–2019 at $p<0.05$.

Supplementary Table 2. Odds ratios, 95% confidence intervals, and p-values of predictors of in-patient admission from the ED modeled by multilevel regression analysis for combined urological presentations, renal colic, gross hematuria, and acute urinary retention

Cohort	Predictor	Adjusted OR	95% CI	p
Combined presentations†	Age (per decade)	1.51	1.04–2.18	0.029*
	Male gender	0.75	0.21–2.74	0.667
	Within downtown core	0.66	0.21–2.09	0.480
	Gross hematuria + acute urinary retention	1.61	0.50–5.16	0.423
Renal colic	Age (per decade)	1.48	0.81–2.69	0.200
	Male gender	0.67	0.09–5.16	0.701
	Within downtown core	0.98	0.12–7.81	0.989
Gross hematuria	Age (per decade)	1.27	0.75–2.13	0.370
	Male gender	1.43	0.17–12.33	0.743
	Within downtown core	0.68	0.13–3.62	0.648
Acute urinary retention	Age (per decade)	1.49	0.47–4.74	0.499
	Male gender	0.22	0.01–8.94	0.425
	Within downtown core	0.93	0.05–17.31	0.962

†Modeling in-patient admission when urological presentation is split into three groups – renal colic, gross hematuria, and acute urinary retention – results in very large odds ratios and confidence intervals due to the relatively small number of admissions seen in the data. Consequently, urological presentation is split into two groups – renal colic vs. gross hematuria combined with acute urinary retention.
*Predictor significant at $p<0.05$. CI: confidence interval; O: odds ratio.

Supplementary Table 3. Incidence rate ratios, 95% confidence intervals, and p of predictors of wait time for urology clinic visit after initial ED visit modeled by multilevel regression analysis for each cohort: Combined presentations, renal colic, gross hematuria, and acute urinary retention.

Cohort	Predictor	Incidence rate ratio	95% CI	p
Combined presentations	Age (per decade)	0.97	0.94–1.01	0.15
	Male gender	0.99	0.86–1.14	0.882
	2018-2019 year	1.46	1.30–1.63	<0.001**
	Within downtown core	1.00	0.90–1.11	0.966
	Gross hematuria	1.21	1.07–1.37	0.002*
	Renal colic	1.11	0.95–1.28	0.179
Renal colic	Age (per decade)	0.95	0.90–1.00	0.046*
	Male gender	0.99	0.82–1.19	0.904
	2018-2019 year	1.48	1.1–1.88	0.001*
	Within downtown core	0.86	0.72– 1.03	0.111
Gross hematuria	Age (per decade)	0.95	0.91–1.00	0.068
	Male gender	0.98	0.79–1.20	0.817
	2018-2019 year	1.42	1.2 –1.68	<0.001**
	Within downtown core	1.10	0.94–1.29	0.224
Acute urinary retention	Age (per decade)	1.04	0.96–1.12	0.326
	Male gender	0.99	0.67–1.46	0.962
	2018–2019 year	1.38	1.15–1.66	<0.001**
	Within downtown core	0.97	0.81–1.16	0.712

*Predictor significant at $p<0.05$. **Significant at $p<0.001$.