

# Profiles of Opioid Consumption Associated with an Increased Risk of Acute Opioid-Related Healthcare Events



Siyana Kurteva<sup>1,2</sup>, Michal Abrahamowicz<sup>1</sup>, Tara Gomes<sup>3,4,5</sup>  
Robyn Tamblyn<sup>1,2,6,7</sup>



<sup>1</sup> Department of Epidemiology and Biostatistics McGill University, <sup>2</sup> McGill Clinical and Health Informatics Research Group, <sup>3</sup> Institute of Health Policy Management and Evaluation, <sup>4</sup> Li Ka Shing Knowledge Institute, <sup>5</sup> I CES, <sup>6</sup> Faculty of Medicine McGill University

## Introduction

- Canada is the world second largest per capita consumer of opioids defined by daily opioid doses. Recent data shows an increase of almost 7% in the number of written opioid prescriptions between 2012 and 2016.
- Substantial increases in the prescription of opioids have also been accompanied by marked increases in opioid-related mortality and morbidity. Multiple policy and public health interventions have been implemented to stem the ongoing opioid epidemic. While better pain management has guided policies for opioid use, there is limited evidence regarding how prescription patterns are associated with an increased risk of avoidable adverse events.

## Objective

- To determine the association between time-varying opioid use, including dose, duration and opioid type, and the risk of opioid-related emergency department (ED) visits, re-admissions or death in the one-year post-discharge period.

## Methods

This study uses a cohort of patients discharged from two hospitals within an academic health center in Quebec, Canada, who filled an opioid prescription 3 months' post-discharge was assembled.

**Exposure Definition:** time-varying current use, continuous and cumulative duration of use, daily dose and opioid type.

**Outcome Definition:** opioid-related hospital re-admission, emergency department visit or all-cause death, whichever occurred first.

**Statistical Analyses:** Multivariable Marginal Structural Cox Proportional Hazards models

**Data Sources:** Provincial health insurance claims and medical services, and medical records

Covariates used in inverse probability treatment weighing: :

**Measured one year prior to admission:** Number of previous hospitalizations, Number of previous ED visits, Number of pharmacies at baseline, cancer diagnosis, history of opioid /benzodiazepine use, history of mental health disorders, history of substance/alcohol abuse, tobacco use

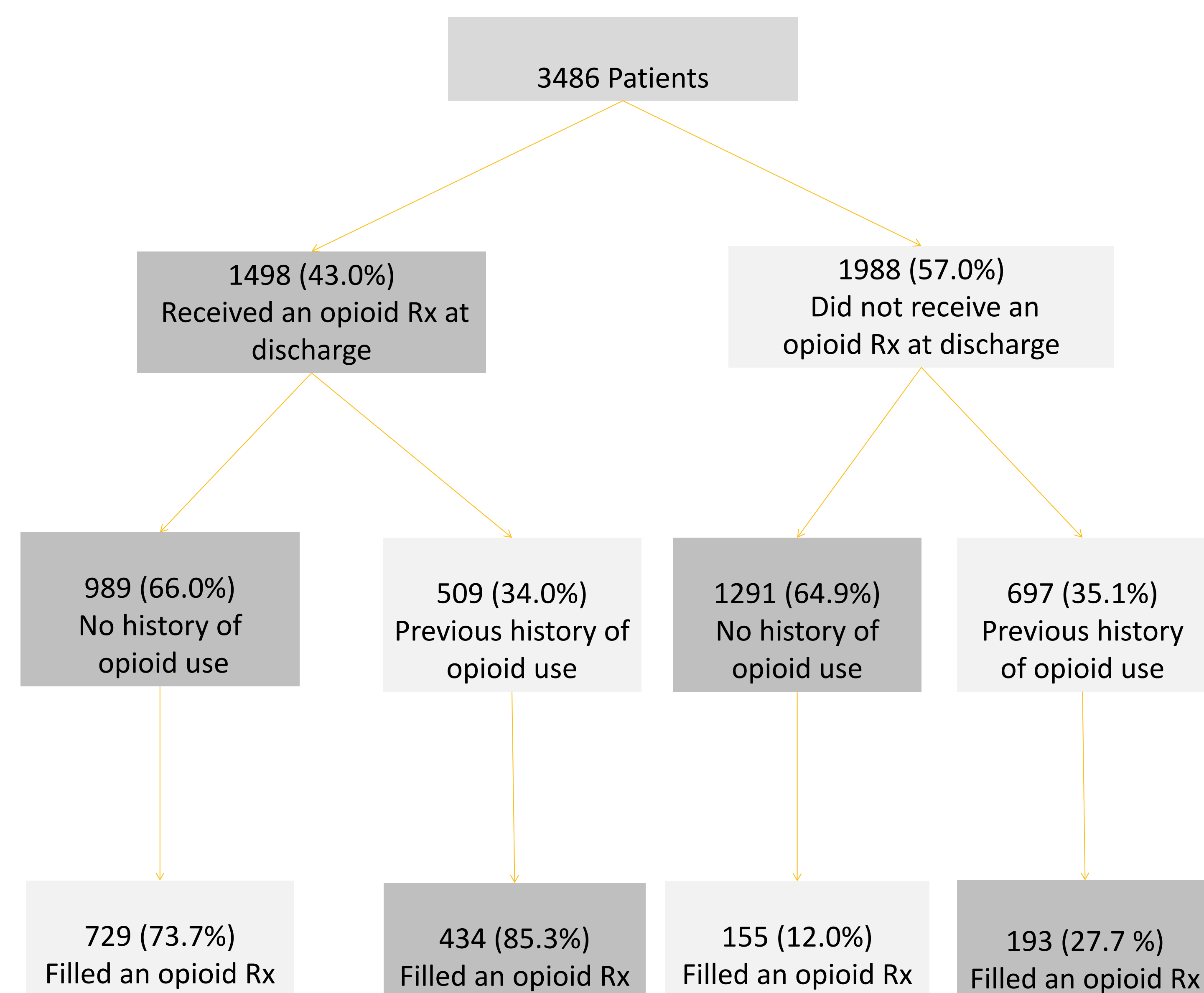
**Measured at discharge:** age, gender, hospital unit, benzodiazepine prescription, anti-depressant prescription.

## Results

**Table 1. Characteristics of 1510 study patients who filled an opioid prescription in the 3 months' post-discharge**

	Internal Medicine (n = 392, 21.7%)	Surgery (n = 1119.66.7%)
<b>Age at admission</b>		
Mean (SD)	67.7 (16.8)	66.9(11.9)
<b>Length of the hospital stay (&gt;6 days)</b>	351 (89.5)	875 (78.2)
<b>Health service use one year prior to hospitalization</b>		
<b>Sum of previous ED visits in the one year before baseline date</b>		
Mean (SD)	15.3 (20.3)	4.4 (8.1)
<b>Number of pharmacies dispensing opioids in the past one year</b>		
Mean (SD)	0.9 (0.7)	0.4 (0.6)
<b>Medication use</b>		
<b>History of opioid use (n,%)</b>	283 (72.2)	344 (30.7)
<b>History of long-acting opioid use (n,%)</b>	89 (22.7)	35 (3.1)
<b>Opioid Rx at discharge (n,%)</b>	202 (51.5)	987 (88.2)
<b>Comorbidities</b>		
<b>Pain syndromes (n,%)</b>	221 (56.4)	408 (36.5)
<b>Cancer diagnosis (n,%)</b>	168 (42.9)	538 (48.1)
<b>Mental illness (n,%)</b>	74 (18.9)	132 (11.8)
<b>Substance and/or alcohol abuse (n,%)</b>	27 (6.9)	19 (1.7)

**Figure 1. Overall opioid prescriptions and dispensations 90 days post-discharge**



**Table 2. Association between opioid use and risk of emergency department visits and re-admissions in the 90 days post-discharge**

	Events	Average Starting Dose (MME)	Adjusted HR (95% CI)
<b>Current Use</b>			
<b>Non use</b>	128	--	[Ref]
<b>Use</b>	113	34.9 (28.6)	1.71 (1.04 – 2.82)
<b>MME Daily Dose</b>			
<b>&lt;50</b>	71	29.7 (20.3)	[Ref]
<b>50-90</b>	22	44.8 (27.6)	2.02 (0.98 – 4.19)
<b>&gt;90</b>	26	93.5 (82.2)	3.24 (1.43 – 7.35)
	24		
<b>Cumulative Duration Use</b>			
<b>1-30</b>	123	33.7 (19.6)	[Ref]
<b>30-60</b>	44	32.9 (24.7)	1.55 (0.95 – 2.52)
<b>60-90</b>	24	38.4 (35.5)	2.45 (1.18 – 5.09)
<b>&gt;90</b>	50	44.9 (48.2)	2.56 (1.25 – 5.27)

3/4

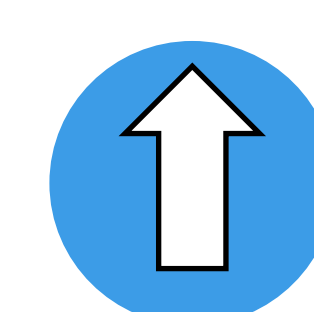


75% of patients who filled an opioid prescription 3-month following their admission received an opioid at hospital discharge



16% of patients had an opioid-related ED visit or a hospitalization

Cumulative Opioid Duration > 90 days

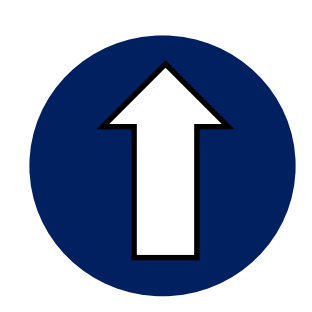


2.56 times

increased risk of re-admissions and ED visits



Mean Daily Dose of ≥90 MME



3.24 times

increased risk of re-admissions and ED visits

## Conclusions

- Increased risk of ED visits or hospitalizations when comparing use of opioids to non-use
- Increased risk with longer duration of use
- Potential policy implication: provincial prescription drug monitoring program that would re-assess duration of treatment with opioid use, increased access to pain clinics and publicly funded physiotherapy services.

## Acknowledgements

SK receives doctoral funding from the FRQS, CIHR - DSECT, Rossy Cancer Network

This project is supported by a foundation grant from the Canadian Institute for Health Research