

Phenazopyridine-exposure calls to poison centres over time: impact of marketing status changes

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Background: Phenazopyridine is a urinary tract analgesic used for symptomatic relief from urinary tract infections. Toxicity includes renal injury, methemoglobinemia and hemolytic anemia. Since 2006 in Canada, phenazopyridine has only been available from compounding pharmacies. In contrast, phenazopyridine has a dual marketing status in the United States: formulations over 100 mg are prescription-only, but formulations of < 95 mg are available over the counter (OTC).

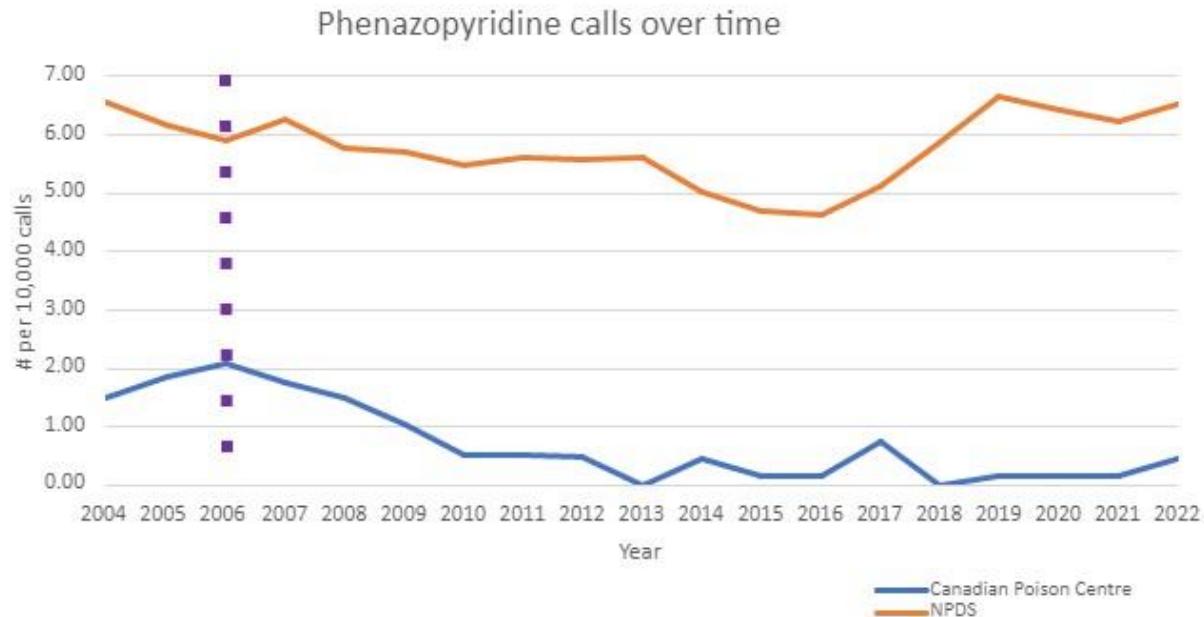
Objective: To assess whether the change in marketing status impacted phenazopyridine-related calls to a Canadian poison centre, and to compare to the incidence of calls to US poison centres (consistent market availability).

Methods: We performed a cross-sectional time series analysis of phenazopyridine-related calls to a regional Canadian poison centre from January 1, 2004, to December 31, 2022. We also examined calls to US poison centres via data from the National Poison Data System (NPDS). We identified calls using the generic code for phenazopyridine and include single and multiple-substance calls. We excluded calls coded as “non-exposure”. The primary outcome was the yearly incidence of phenazopyridine calls to the Canadian poison centre and in NPDS. To examine if the change in Canadian market availability (starting in 2007) impacted the medical outcome of calls and the intention of exposure calls, we compared the percentage of moderate and severe outcomes and the percentage of intentional calls in each cohort from 2004-2006 and 2007-2022 using chi-square and Fisher’s exact tests.

Results: The yearly incidence of phenazopyridine calls to the Canadian poison centre decreased over the study period, whereas the number of calls in the NPDS remained consistent (Table 1, Figure 1). The change in the Canadian market availability of phenazopyridine in 2007 was associated with lower incidence of calls to the Canadian poison centre (2006: 2.1 per 10,000 calls; 2022: 0.5 per 10,000 calls). No corresponding decrease was observed in the yearly incidence of calls reported in NPDS. A non-significant trend of calls with severe outcomes was observed at the Canadian poison centre after 2006 (2004-2006: 3.2% vs 2007-2022: 17.7%, $p = 0.08$). In comparison, there was a decrease in the proportion of severe calls in the NPDS data (3.5% vs 2.6%, $p < 0.01$). There was no difference in the proportion of intentional calls pre- and post-the change in market availability to the Canadian poison centre (2004- 2006: 35.5% vs 2007-2022: 45.1%, $p = 0.49$). In contrast, we observed a decrease in the percentage of intentional calls to US poison centres during this period (2004-2006: 7.0% vs 2007-2022: 3.9%, $p < 0.01$).

Discussion and Conclusion: Phenazopyridine exposures are uncommon, especially in Canada where the drug has been unavailable since 2006. Prior to this, phenazopyridine was available to Canadian patients, but only through prescription. In the United States, phenazopyridine is available both OTC and by prescription. In our study, we show that calls to a Canadian poison centre were impacted by the withdrawal of phenazopyridine from the Canadian market. This is in comparison to in the U.S., where the incidence of calls in the NPDS was consistent over the study period.

Figure 1:
Phenazopyridine calls over time (# of calls per 10,000 calls). Dotted purple line indicates when market availability decreased in Canada.





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Table 1:
Phenazopyridine calls to a Canadian Poison Centre and NPDS

Year	Calls to Regional Poison Centre in Canada # (# per 10,000 calls)	NPDS calls # (# per 10,000 calls)
2004	8 (1.51)	1597 (6.55)
2005	10 (1.86)	1493 (6.16)
2006	13 (2.09)	1420 (5.91)
2007	11 (1.78)	1555 (6.27)
2008	9 (1.51)	1439 (5.78)
2009	6 (1.03)	1416 (5.71)
2010	3 (0.51)	1308 (5.48)
2011	3 (0.52)	1307 (5.60)
2012	3 (0.49)	1271 (5.59)
2013	0	1231 (5.63)
2014	3 (0.46)	1090 (5.03)
2015	1 (0.15)	1022 (4.71)
2016	1 (0.15)	1003 (4.65)
2017	5 (0.74)	1084 (5.12)
2018	0	1234 (5.88)
2019	1 (0.15)	1432 (6.67)
2020	1 (0.15)	1367 (6.42)
2021	1 (0.15)	1298 (6.24)
2022	3 (0.45)	1349 (6.53)