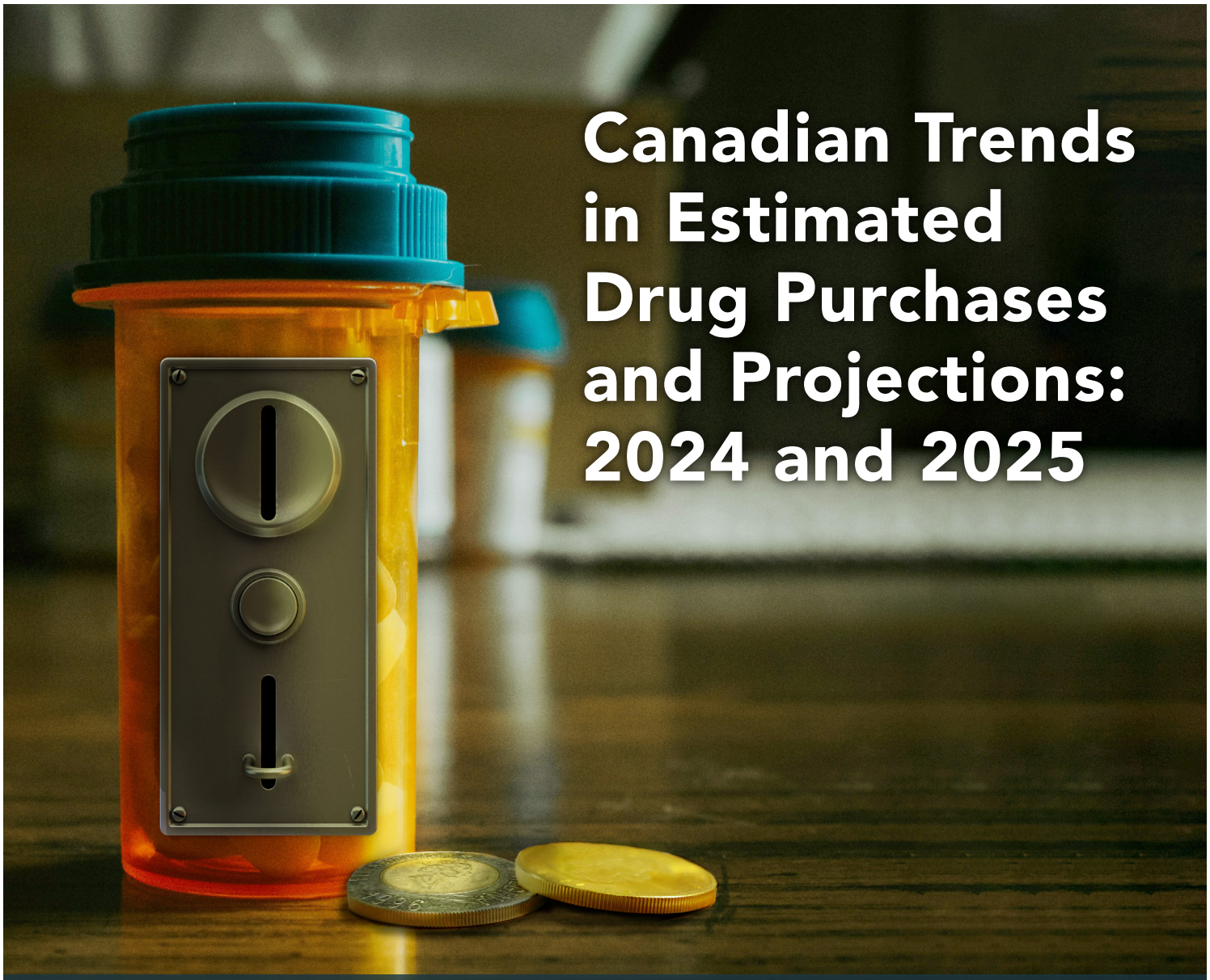
Volume 2 Issue 1 Spring 2025

Hypothesis

PERSPECTIVES INSIGHTS & THOUGHT LEADERSHIP IN THE LIFE SCIENCES



Canadian Trends in Estimated Drug Purchases and Projections: 2024 and 2025

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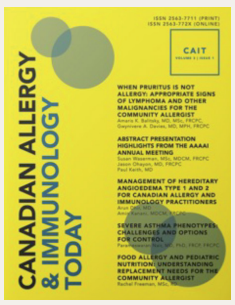

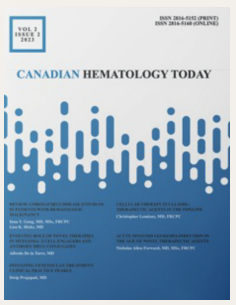

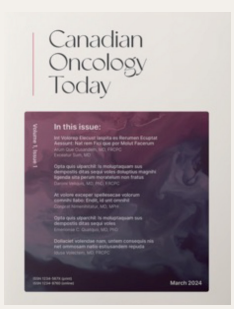

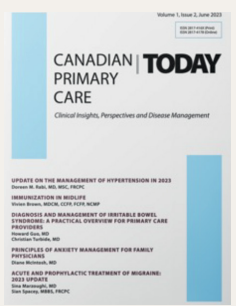

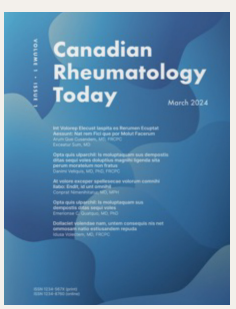

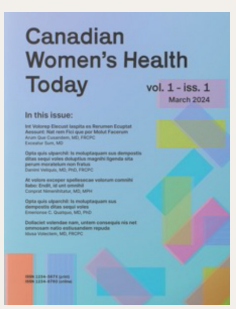

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Letter From Our Editor-in-Chief

Welcome back for our second year of publication! We're so excited to continue this journey with you and to provide a public square (of sorts) where the life-sciences community in Canada can gather and read about relevant information that affects our industry! Please share the journal link with a friend: **www.hypothesismag.com**.

I'd be remiss if I didn't thank our loyal sponsors: The Bedford Group TRANSEARCH, Impres Inc., and Bayshore Specialty Rx. We can't do this alone, and the advertising support of these leading Canadian companies is a testament to the fact that we're doing something right!

As all our readers know, we produce original content in this magazine, but we also try and curate special 'spotlight' articles that we think are important and that you may have missed! This issue features one such article about projected drug spending in Canada for 2024/25 in both the retail and hospital sectors–it's really worth a read. We sat down with Darran Fischer from Phillips Canada and also spoke with Melinda Gooderham a dermatologist and internationally-renowned key opinion leader from right here in Canada. Our patient interview helps shed light on autoimmune encephalitis. And of course, we top it all off with news about your products and the people in the industry who are moving and shaking!!

We hope you enjoy this issue and that you'll share it with your peers. We welcome your feedback!

Lea

Lea Prevel Katsanis, PhD
Lea Prevel Katsanis is a professor in the Department of Marketing at the John Molson School of Business at Concordia University. Katansis, who spent many years working around the world for major global pharmacy brands, is the author of Global Issues in Pharmaceutical Marketing.

Apocalypse Now

Great movie. Also, words used to describe U.S. healthcare under this new administration.

By Rohit Khanna, MBA, MSc, MPH

In case you haven't been paying close attention (and who could blame you for wanting to pretend none of this is really happening), the new administration in the U.S. has decided that healthcare and public health should be, ahem, re-evaluated from top to bottom.

I saw Marty Makary, the new FDA commissioner, on CNN last week. It was disturbing. The host tried to ask him about potential layoffs that would affect the safety of America's food policy—namely the resignation of one of the top researchers on food and nutrition policy who resigned from the NIH. He danced, bobbed, and weaved and talked about 'efficiency' and a 'bloated federal government."

And if we want to be really sanguine about the whole thing and take the position that food and nutrition policy isn't really a 'hot button' issue and that the resignation of one person (no matter how important) on the purported grounds of censorship at the NIH under Robert F. Kennedy's leadership is a strawman argument, we can do that. But we can't ignore the potential layoffs of 3,500 Food and Drug Administration (FDA) employees under Kennedy's leadership which, if accurate, could impact drug and device approval timelines. And we're not talking about approving the fourteenth ACE inhibitor or ninth SSRI. These are life-saving drugs and devices that may not come to market on time (or ever) if these cuts are as deep as we think they are.

And there's the real issue of active pharmaceutical ingredients (API) and finished pharmaceutical products themselves that might fall under the Trump administration's tariff policies. According to an analysis by *The Guardian*, "pharmaceuticals are rated at a zero tariff around the world under a 1995 World Trade Organization agreement aimed at making medicines more accessible." And in the same analysis, it was also reported that "the US pharmaceutical company Merck has said it expects to pay an extra $200m (£150m) in costs this year from tariffs."[1] That's just one company. Some will undoubtedly move manufacturing to the U.S. or make announcements about investments in the U.S. to appease the new U.S. administration. And maybe some will even absorb these costs in the short term. But make no mistake about the fact that, in the

long run, patients will pay more for medicines that are already straining their pocketbooks. And when that happens, history, along with a robust library of health policy literature, teaches us that patients ration their prescriptions and try to stretch a 30-day prescription into a 45-day or 60-day prescription. Or worse, they don't fill their prescriptions at all.

If you're a medical device maker that manufactures in the U.S. but relies on raw material inputs from China, India, or, for that matter, anywhere else, your costs have gone up. The pacemakers and the MRI machines are not just more expensive to make; they might be downright difficult to manufacture if some countries (i.e. China) decide to halt shipments of key raw material inputs to the U.S. as retribution for 145% tariffs.

Recently, an article in *The New York Times* reported that "a federal prosecutor has sent letters to at least three medical journals accusing them of political bias and asking a series of probing questions suggesting that the journals mislead readers, suppress opposing viewpoints and are inappropriately swayed by their funders."[2] The article went on to opine that "some scientists and doctors said they viewed the letters as a threat from the Trump administration that could have a chilling effect on what journals publish. The health secretary, Robert F. Kennedy Jr., has said he wants to prosecute medical journals, accusing them of lying to the public and colluding with pharmaceutical companies."[3] And, in case you still doubt the mainstream media's accurate reporting on Kennedy and think there may be a little bias there, here's a verbatim quote from Kennedy last year during a podcast interview: "I'm going to litigate against you under the racketeering laws, under the general tort laws," he said. "I'm going to find a way to sue you unless you come up with a plan right now to show how you're going to start publishing real science and stop retracting the real science and publishing the fake pharmaceutical science by these phony industry mercenaries."[4]

And let's be clear: we all want America to be healthy again. But having Kennedy at the helm of the Department of Health and Human Services and the de facto leader of the Make America Healthy Again (MAHA) movement is wholly unsettling. It's the autism comments, and the vaccine equivocation, and the insistence that fluoride be removed from drinking water, and the belief that COVID-19 targets specific ethnic groups.[5] This is like having a world-class triathlete own a Dairy Queen franchise. This is like having someone who believes that the Earth is flat as the head of NASA. In a recent article in *The Atlantic*,[6] "Kennedy has touted cod-liver oil as a valid measles treatment (it's not), said that Americans are being "poisoned" by seed oils (they're not), and claimed that "many" vaccines are not adequately safety-tested (they are). And he has readily cherry-picked and exaggerated findings to suit his own needs: 'There's a scientist at Harvard now who is curing schizophrenia with a carnivore diet,' he said at a press conference in March (it's not a carnivore diet, and it's not a cure)."

I mean the words 'bat' and 'shit' come to mind. And we're 100 days into this. Three years and nine more months to go.

Unlike real life, we can't get up and walk out on this bad movie.

Rohit Khanna, MBA, MSc, MPH
Rohit Khanna is the Managing Director of Catalytic Health, a leading life-sciences communication, publishing, and strategy firm. He holds a B.A. from McGill University, an M.B.A. from Queen's School of Business, an MSc. from the London School of Economics & Political Science and a Master of Public Health in Epidemiology from Harvard School of Public Health. His first book entitled *Misunderstanding Health: Making Sense of America's Broken Health Care System* was published in October 2021 by Johns Hopkins University Press. His second book is due for release in 2025. He can be reached at rohit@catalytichealth.com

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6. *https://www.theatlantic.com/health/archive/2025/04/-trump-kennedy-science-government-propaganda/682569/*

TOP UNDER 20 40 IN LIFE SCIENCES

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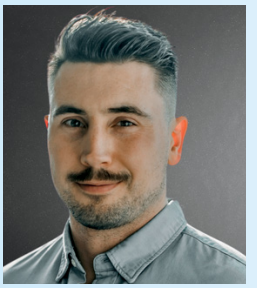
Canurta Therapeutics



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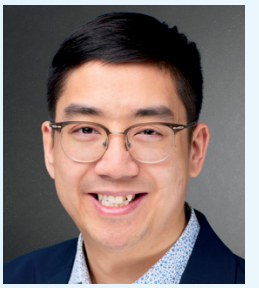

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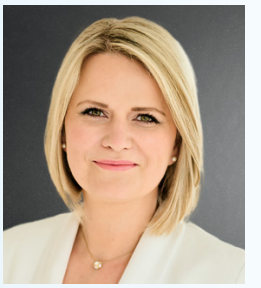

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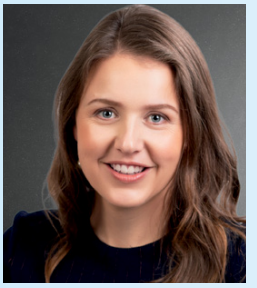

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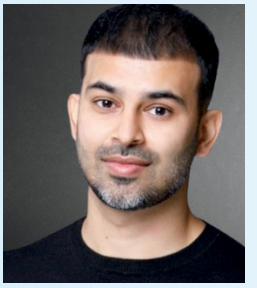

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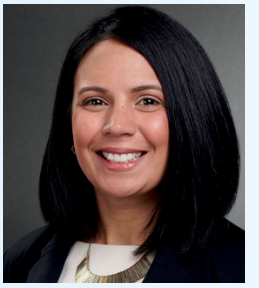

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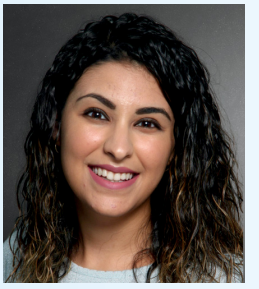

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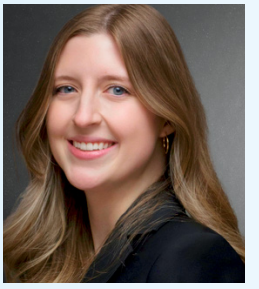

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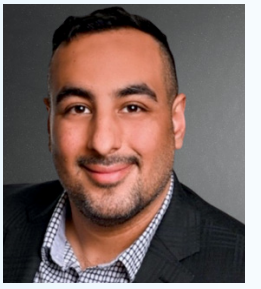

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Canadian Trends in Estimated Drug Purchases and Projections: 2024 and 2025

Mina Tadrous, Kevin Z. Wang, Shanzeh Chaudhry, Cherry Chu, Fiona Clement, Jason R. Guertin, Michael R. Law, Wade Thompson, Tara Gomes, Kaleen N. Hayes

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Background: Data on trends in the pharmaceutical market remain limited. We offer an annual update on estimated drug purchases in Canada and highlight key factors that could impact future spending. This information aims to assist public and private decision-makers in forecasting the growth of national drug purchases.

Methods: We conducted a retrospective time-series analysis of annual estimated drug purchases across Canada between 2001 and 2023 using IQVIA's Canadian Drugstore and Hospital Purchases Audit. We calculated total estimated drug purchases and relative percentage change annually, stratified by sector (retail and hospital), and forecast annual spending to 2025. We also assessed recent drug approvals, policies, or legislation that may influence drug spending.

Results: Total estimated drug purchases for 2023 were approximately $43.5 billion, 13.7% higher than in 2022 (retail purchases: 12.9% growth; hospital purchases: 17.7% growth). Overall, expenditure on the top 25 high-cost drugs accounted for 32.5% and 53.3% of total spending in the retail and hospital sectors, respectively. Pharmaceutical spending has grown over the past 2 decades, with an annual average growth of 5.8% and 8.2% in the retail and hospital sectors, respectively. Drug expenditure in the retail sector is expected to increase annually by 10.9% to 10.1% and spending within the hospital sector is expected to increase by 14.6% to 12.9% for 2024 and 2025, respectively.

Interpretation: This study indicates evidence of accelerated growth in overall estimated drug purchases, likely driven by the increasing use of new diabetes and obesity treatments. Continued growth in drug purchases is projected across the Canadian market, which will be influenced by new approvals of specialty and oncology drugs as well as generic and biosimilar versions of the top 25 drugs. Without measures to address this ongoing increase in pharmaceutical spending, there may be a need to reallocate funds from other public sectors or shift costs to private industry and patients. The potential opportunity costs of rising pharmaceutical spending warrant careful consideration.

For author information, refer to **Appendix 1.**

Introduction

Total health care spending in Canada was forecasted by the Canadian Institute for Health Information (CIHI) to reach more than $344 billion in 2023, representing 12.1% of the country's gross domestic product.[1] Spending on prescription drugs was expected to account for 13.9% of national health care purchases, which was an increase of 3.0% from the previous year's projections.[1]

In 2022, our group published a second update highlighting spending on drugs in Canada.[2] Briefly, we found that drug spending increased on average by 5.4% annually in the retail sector and by 7.4% annually in the hospital sector between 2001 and 2021.[2] We projected that spending was likely to continue increasing until at least 2023.[2] Although drug spending was historically driven by simple, small molecule medications, our results highlighted that complex therapies, such as biologics and biosimilars, were now

the key contributors to drug spending.[2] Furthermore, we projected that drug spending for the years 2022 and 2023 would increase annually by 5.6% and 5.3%, respectively, in the retail sector and by 9.4% and 8.8%, respectively, in the hospital sector.[2] These projections were based on the information available at the time regarding novel treatments being approved by Health Canada and the US FDA combined with historical growth in spending.

Budget planning is an annual process that requires forecasting potential growth; therefore, this analysis aims to assist decision-makers and formulary managers in shaping their yearly budgets and strategies. Approvals of novel pharmaceutical technologies are likely to impact future budgets, so an annual update on spending forecasts and horizon scanning is essential. Independent assessments of drug spending across the country can help public and private decision-makers better anticipate how various factors, including new technologies, may affect spending trends. In this updated report, we present current trends and forecasts for retail and in-hospital estimated drug purchases across Canada as well as a horizon scan of upcoming drugs that could influence future spending trajectories.

Methods

Drug Purchases and Projection

We conducted a retrospective time-series analysis of annual estimated drug purchases (i.e., drug purchases across Canada between January 1, 2001, and December 31, 2023, using IQVIA's Canadian Drugstore and Hospital Purchases Audit. These data estimates purchasing costs and unit volumes of all pharmaceutical products purchased by the Canadian retail and hospital sectors.[3] This audit is derived from a sample of outlets within these sectors (more than 33% of retail and 86% of hospital sectors) in each province and territory, which are projected to represent total pharmaceutical purchasing at the national level using proprietary methods. We included all pharmaceutical purchasing of all dosage forms and formulations over the study period. Purchasing may be made through a wholesaler or directly from the manufacturer, and therefore may include mark-ups, but does not capture discounts and rebates. Although the Canadian Drugstore and Hospital projections will not capture any subsequent rebates or volume discounts credited to the outlets afterward, it does reflect all up-front discounts for each specific invoice. Due to the aggregated nature of the data provided, research ethics board approval was not required.

We describe total estimated drug purchases across Canada annually (using calendar years) over the study period, stratified by sector (retail versus hospital). We calculated the annual growth in purchases as the relative percentage change from the previous year. We used exponential smoothing models and applied Holt's linear method to forecast annual estimated pharmaceutical purchases in 2024 and 2025. Costs were reported as nominal annual costs, and nominal costs were used for the projection models. In a sensitivity analysis, we inflated annual costs before 2023 to the 2023 values using all-items consumer price indexes.[4] Finally, we identified the 25 medications with the highest total purchases in calendar year 2023 within the retail and hospital sectors separately.

Horizon Scan

An environmental scan of global and national drug spending and pipeline reports was conducted to identify therapeutic classes with potentially major impacts on pharmaceutical spending.[5-13] All medications approved by Health Canada in 2023 and the first quarter of 2024, as well as generic drugs and biosimilars currently under review, were assessed for anticipated impacts.[14] New drug approvals by the US FDA in 2023 and the first quarter of 2024 were also reviewed to identify drugs that may soon enter the Canadian market.[15]

Drugs with a potential for high impact on future spending (via upward pressure or downward pressure) were flagged based on the following criteria: disease prevalence, current medication use and availability in the therapeutic area, and anticipated cost. Our approach was consistent with earlier work we conducted.[2,23,25,26] Based on the list of drugs with the highest potential for impact on the Canadian market, the authors used this information to highlight some drugs that are likely to impact forecasted spending.

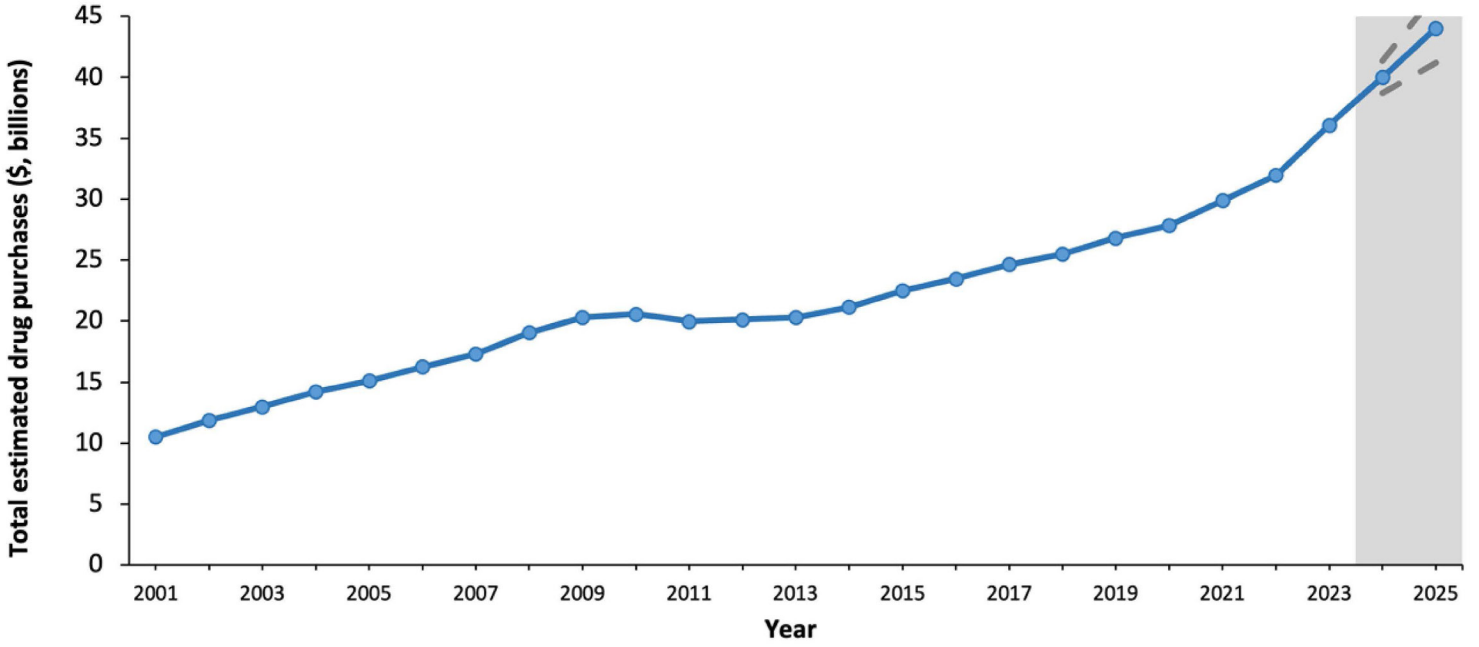

Figure 1. *Total Medication Purchases in Canada for the Retail Sector From 2001 to 2023 and Projected to 2024 and 2025.*

Note: *The grey zone illustrates forecasted purchases in the retail sector (solid line) with 95% confidence interval estimates (dashed lines) for 2024 and 2025.*

Source: *This figure is based on information licensed from IQVIA: Canadian Drugstore and Hospital Purchase Audit for 2001 to 2023 estimates of real-world activity. All rights reserved.*

Results

Trends in Canadian drug purchases from 2001 to 2023 in the retail and hospital sectors are presented in **Figure 1** and **Figure 2**, respectively. Graphs that include values accounting for inflation can be found in **Appendix 2 (Figure 4 and Figure 5)**.

Overall Spending

In 2023, total annual estimated drug purchases in Canada grew 13.7%, reaching $43.5 billion (versus $38.3 billion in 2022). This growth far exceeded the previously forecasted rate of 5.9%.[2] The retail sector accounted for 82.9% of estimated drug purchases in 2023 ($36.1 billion), and the hospital sector accounted for 17.1% ($7.4 billion). Retail and hospital purchases in 2023 increased from 2022 by 12.9% and 17.7%, respectively, with both rates exceeding our previously forecasted 2023 rates of 5.3% and 8.8%, respectively. **Figure 3** illustrates the trends in annual change in purchases across both sectors.

Retail and Hospital Spending

Over the entire study period (2001 to 2023), average annual estimated drug purchase growth was 5.8% in the retail sector and 8.2% in the hospital sector. Total estimated drug purchases in the retail sector increased by 243%, increasing from $10.5 billion in 2001 to $36.1 billion in 2023. Drug purchases grew even more sharply in the hospital sector, by 452%, from $1.3 billion in 2001 to $7.4 billion in 2023.

In the retail sector, growth was stronger in the earlier years, with an average annual increase of 6.7% between 2001 and 2011 compared to 5.1% from 2012 to 2023. Notably, 2011 was the only year with a decline in retail drug purchases (−2.9%). In contrast, in the hospital sector, estimated drug purchases grew consistently, with an average annual increase of 6.5% between 2001 and 2011, which increased to 9.6% from 2012 to 2023, without any year of decline.

In recent years, drug purchases in both sectors have shown significant growth. In the retail sector, estimated drug purchases rose by 3.8%, 7.3%, 7.0%, and 12.9% in 2020, 2021, 2022, and 2023, respectively. Hospital-administered drug purchases saw even larger increases, with growth rates of 6.9%, 12.4%, 14.7%, and 17.7% in 2020, 2021, 2022, and 2023, respectively. These recent trends indicate a substantial acceleration in spending, particularly in the hospital sector, reflecting the growing demand for newer and more expensive treatments.

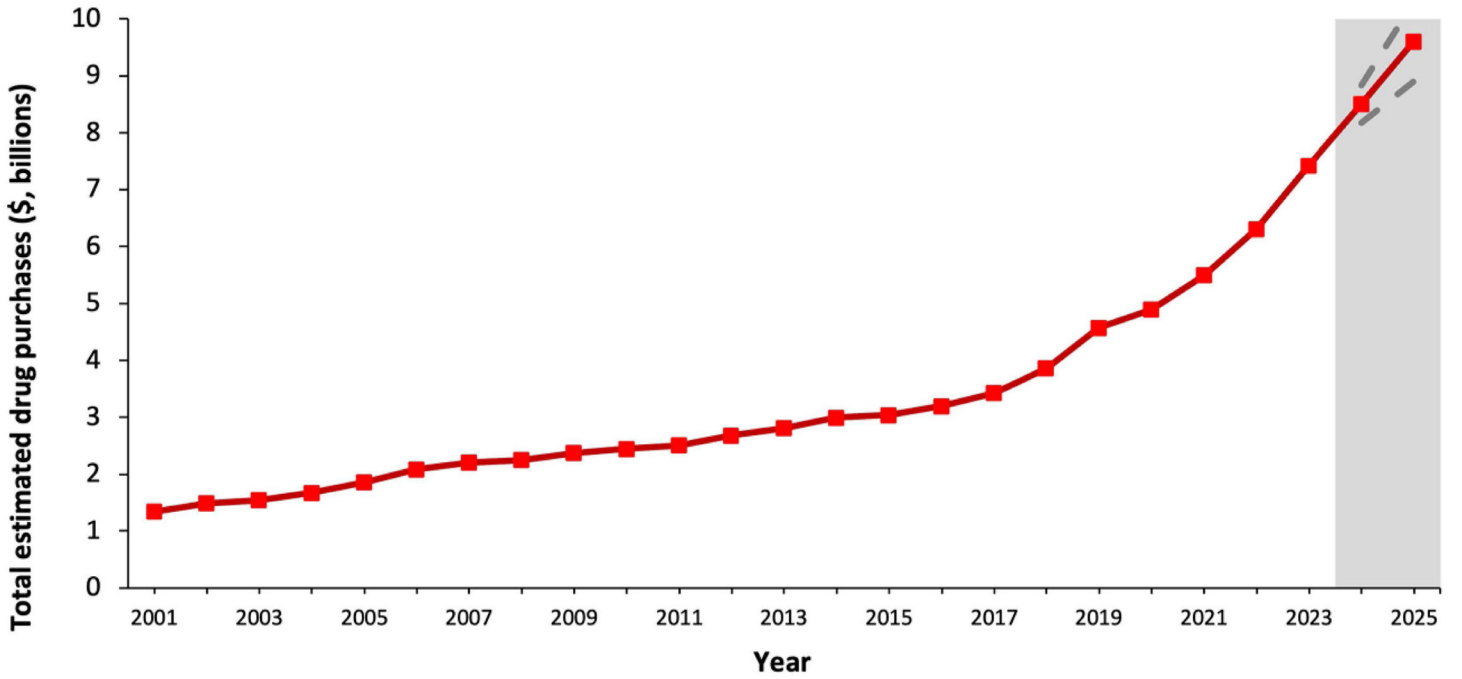

Figure 2. *Total Medication Purchases in Canada for the Hospital Sector From 2001 to 2023 and Projected to 2024 and 2025.*

Note: *The grey zone illustrates forecasted purchases in the hospital sector (solid line) with 95% confidence interval estimates (dashed lines) for 2024 and 2025.*

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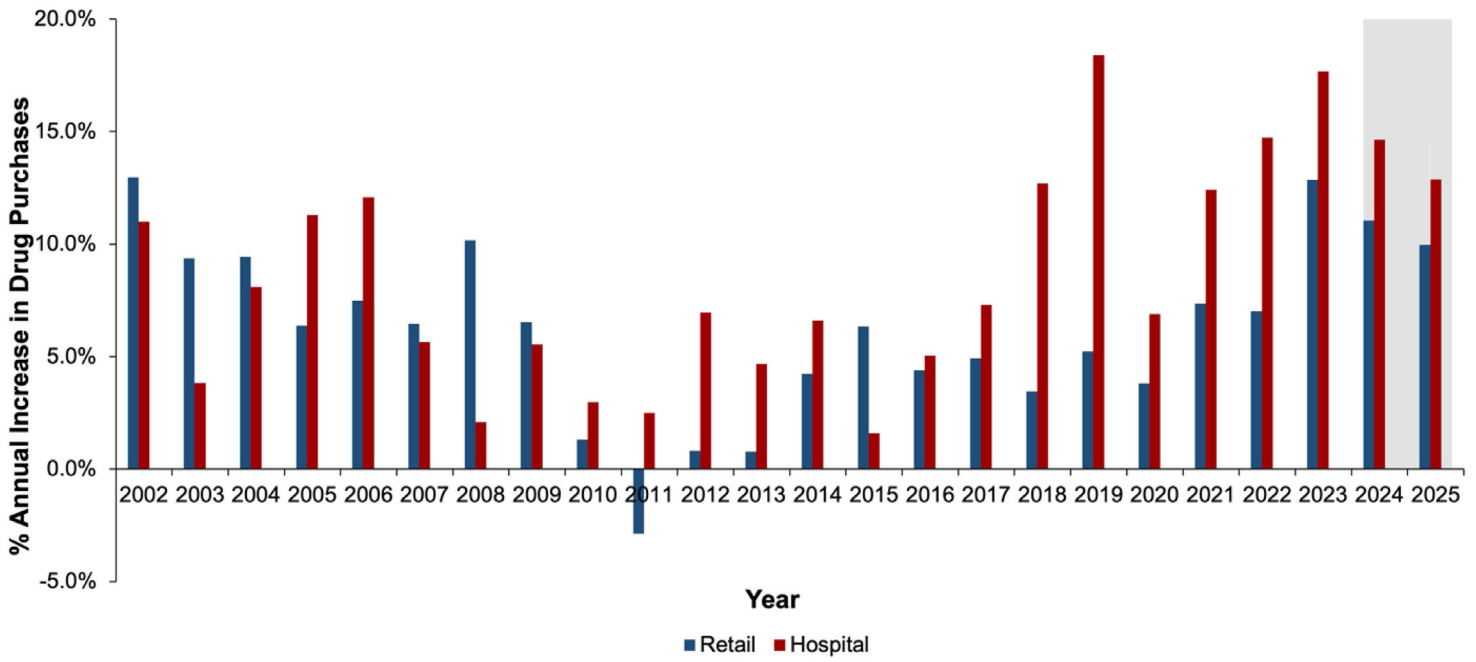

Figure 3. *Annual Growth (%) in Drug Purchases From the Previous Year for the Retail and Hospital Sectors, 2002 to 2023 and Projected Growth for 2024 and 2025.*

Note: *The grey zone illustrates forecasted annual growth for 2024 and 2025.*

Drug Expenditure Forecast for 2024 and 2025

We forecast a yearly increase (all sectors combined) in estimated drug purchases of 11.5% (95% confidence interval [CI], 7.7% to 15.3%) in 2024 and 10.5% (95% CI, 3.3% to 17.8%) in 2025 (**Figure 3**). We project that purchases in the retail setting will increase by 10.9% (95% CI, 7.2% to 14.5%) and 10.1% (95% CI, 3.0% to 17.1%) annually for 2024 and 2025, respectively. We project that hospital-administered drugs will increase annually by 14.6% (95% CI, 10.2% to 19.0%) and 12.9% (95% CI 4.7% to 21.1%) for 2024 and 2025, respectively. In absolute costs, we forecast the total spending will increase to $44 billion (95% CI, $41.2 billion to $46.9 billion) for retail purchases and $9.6 billion (95% CI, $8.9 billion to $10.3 billion) for hospital purchases by 2025 (**Figure 1** and **Figure 2**).

Top 25 Drugs by Overall Purchases in 2023

Table 1 lists the top 25 drugs by estimated drug purchases in retail and hospital settings across the country for the year 2023. Semaglutide ($1.9 billion), infliximab ($1.2 billion), and ustekinumab ($912 million) were the top 3 highest expenditure drugs in the retail setting, whereas pembrolizumab ($797 million), daratumumab ($548 million), and nivolumab ($328 million) were the top 3 drugs in the hospital setting. Only 3 drugs were in the top 25 of both lists: aflibercept (a vascular endothelial growth factor-A antagonist) at number 5 in retail spending and number 22 in hospital spending, ibrutinib (a small molecule inhibitor of Bruton tyrosine kinase) at number 19 in retail spending and number 17 in hospital spending, and bictegravir-emtricitabine-tenofovir-alafenamide (a complete regimen for the treatment of HIV-1 infection) at number 22 in retail spending and number 18 in hospital spending. Overall, total purchases for the top 25 drugs in both markets in 2023 accounted for $15.7 billion ($11.7 billion and $4.0 billion in retail and hospital sectors, respectively), which accounted for 32.5% and 53.3% of total spending in each sector respectively.

Horizon Scan

Global reports were reviewed to determine trends for drug spending in Canada (**Appendix 2, Table 3**). Here, we summarize major themes for new and upcoming therapies in Canada. We first highlight treatments we believe will have impact on increased spending ("upward pressure") then discuss potential mitigating factors ("downward pressure"). A list of drug approvals for Health Canada and the US FDA in 2023 and the first quarter of 2024 are presented in **Appendix 2, Table 4 and Table 5**, respectively. Health Canada approved 81 drugs in 2023, compared to 73 in 2022.[14] The FDA approved 55 novel drugs in 2023, compared to 37 in 2022.[15]

Potential for Upward Pressure

The drug pipeline remains dominated by oncology drugs. A novel drug, capivasertib (Truqap), was recently approved by Health Canada and the FDA for use in combination with fulvestrant for human epidermal growth factor 2–negative, hormone receptor–positive locally advanced or metastatic breast cancer. The drug is also undergoing late-stage trials for triple-negative breast cancer.[9] Another breast cancer drug, abemaciclib (Verzenio), was initially indicated for advanced and metastatic breast cancer but has since been expanded for use in early breast cancer in 2022. This led to 1 of the highest growths in spending for oncology drugs.[9] Vaccines to treat cancer have the potential to impact spending in the coming years, following the successes of the COVID-19 mRNA vaccines. These drugs may be on the horizon, and include V940/mRNA-4157 (indicated for high-risk melanoma), autogene cevumeran (a personalized vaccine for pancreatic ductal adrenal cancer), TG4050 (indicated for ovarian cancer and HPV-negative head and neck cancer), Tedopi (indicated for advanced non–small cell lung cancer), and VB10.16 (indicated for advanced cervical cancer).[13]

Certain therapeutic areas are likely to increase spending due to the prevalence of these conditions in the Canadian population. Drugs for type 2 diabetes mellitus (T2DM), notably semaglutide, were the top drugs in terms of spending in 2023. Ozempic (semaglutide injection) has a 95% market share of all glucagon-like peptide 1 (GLP-1) analogues, and expenditures increased from $13.5 million in 2019 to $434 million in 2022.[1] Ozempic is one of two GLP-1 receptor agonists that are reimbursed by public drug plans in Canada. Despite having specific criteria limiting its use to T2DM for most payers, there has been increased non-T2DM use of Ozempic due to its effect on weight management.[16] A new related drug, tirzepatide (Mounjaro), was recently approved and shown in early studies to be more efficacious than Ozempic for diabetes.[21,22] Although this could lead to a shift toward prescribers favouring this drug, it is anticipated that spending on this class would remain similar.[9] In terms of inflammatory conditions, there is potential for increased spending due to risankizumab

	Retail			Hospital		
Rank	Drug	Total	Trend	Drug	Total	Trend
1	Semaglutide	$1,943,826,972	↑	Pembrolizumab	$797,330,603	↑
2	Infliximab	$1,220,620,565	↑	Daratumumab	$548,362,800	↑
3	Ustekinumab	$911,623,762	↑	Nivolumab	$328,229,269	↑
4	Adalimumab	$910,774,341	↑	Durvalumab	$233,128,120	↑
5	Aflibercept	$809,989,780	↑	Hemagglutinin (nonspecific)	$159,388,313	*
6	Lisdexamfetamine	$500,293,173	↑	Rituximab	$157,456,996	↑
7	Empagliflozin	$482,576,566	↑	Trastuzumab	$143,118,079	↓
8	Methylphenidate	$475,924,758	↑	Vaccine, HPV, type-6, 11,16, 18, 3	$127,130,442	↑
9	Risankizumab	$379,876,952	*	Ipilimumab	$117,598,712	↑
10	Vedolizumab	$354,293,254	↑	Axicabtagene ciloleucel	$113,451,433	↑
11	Budesonide-formoterol	$310,778,564	↓	Osimertinib	$111,948,035	↑
12	Rivaroxaban	$300,840,969	↑	Remdesivir	$110,329,682	↓
13	Golimumab	$292,710,108	↑	Pertuzumab	$101,301,685	↓
14	Paliperidone palmitate	$259,288,605	↑	Bevacizumab	$96,632,333	↑
15	Dupilumab	$253,907,387	*	Palbociclib	$93,978,366	↓
16	Ocrelizumab	$252,864,488	*	Vaccine, pneumococcal conjugate	$87,337,707	↓
17	Rosuvastatin	$250,035,747	*	Ibrutinib	$84,318,408	↓
18	Etanercept	$237,193,968	↓	Bictegravir-emtricitabine-tenofovir-alafenamide	$82,398,301	↓
19	Ibrutinib	$234,951,456	↓	Darbepoetin alfa	$75,559,363	↑
20	Upadacitinib	$234,445,844	*	Lenalidomide	$72,793,391	*
21	Denosumab	$227,669,589	*	Apalutamide	$67,014,664	*
22	Bictegravir-emtricitabine-tenofovir-alafenamide	$221,362,467	↓	Aflibercept	$64,480,865	*
23	Sacubitril-valsartan	$218,419,431	*	Measles virus, mumps virus, rubella vaccine live: varicella zoster	$63,680,919	↓
24	Guselkumab	$217,796,935	*	Trastuzumab emtansine	$61,400,260	↓
25	Ranibizumab	$215,180,402	↓	Oseltamivir	$61,286,075	*
Total of top 25	$11,717,246,083			$3,959,654,821		
Total 2023 spending	$36,083,388,476			$7,422,483,251		
Proportion of spending on top 25 drugs	32.47%			53.35%		

Table 1. *Top 25 Drugs by Spending in Retail and Hospital Settings for the Calendar Year 2023 and the Trend (Upward or Downward) Compared to 2022.*

Note: ** Indicates new entry to the top 25 drugs in 2023.*

and upadacitinib receiving additional indication approvals after initial market release. Risankizumab (Skyrizi) received new approval for Crohn's disease and psoriatic arthritis in late 2022, whereas upadacitinib (Rinvoq) received approval for Crohn's disease and ulcerative colitis in 2024.[9] Dupilumab (Dupixent) was previously approved for atopic dermatitis and severe asthma, and received new indications in 2023 for atopic dermatitis in pediatric patients as young as six months old, and for prurigo nodularis and eosinophilic esophagitis.[9] Regarding rare diseases — especially in cases in which there are no or few treatment options available — there are more therapies with high prices expected to increase overall spending. Although a single rare disease drug may not significantly impact total spending, the growing number of such drugs and their high price tags collectively contribute to a rising trend in overall expenditures.

Notable examples include trofinetide (Daybue, indicated for Rett syndrome), iptacopan (Fabhalta, indicated for paroxysmal nocturnal hemoglobinuria), zilucoplan (Zilbrysq, indicated for myasthenia gravis), eplontersen (Wainua, indicated for hereditary transthyretin), metreleptin (Myalepta, indicated for lipodystrophy), and pozelimab (Veopoz, indicated for CHAPLE disease), which have estimated average costs upwards of US$2 million per patient per year.[11,12]

Potential for Downward Pressure

Newly approved or upcoming biosimilar drugs have the potential to exert downward pressure on drug spending. Biosimilar market share increased from 23.5% in 2022 to 35.8% in 2023.[9] Ontario's biosimilar transition policy mandated that Ontario Drug Benefit beneficiaries transition to biosimilars for glatiramer, etanercept, insulin lispro, adalimumab, insulin glargine, insulin aspart, infliximab, rituximab, and ranibizumab (Byooviz).[9,17] This policy transition brings the largest payer in line with most other public payers in the country. The transition period ended in late December 2023, and we expect an impact in 2024 and upcoming years as biosimilar alternatives become more readily available.[9,17] For T2DM, insulin glargine, lispro, and aspart have had new biosimilars introduced in recent years that could lead to reduced spending on insulin.[9] Insulin lispro had the lowest penetration rates, which is likely due to a shortage that delayed the transition policies; in the coming years, the impact could be more evident.[9] In the biosimilar drug pipeline, there are two biosimilars for ustekinumab (Wezlana and Jamteki), two biosimilars for aflibercept (Yesafili and Opuviz), and a biosimilar for eculizumab (Bkemv), all of which are expected to be approved in 2024.[13] Also, there are biosimilars in development for mepolizumab (Nucala), which could result in reduced spending in the coming years once approved.[9] Generic drugs are expected to continue reducing spending, with a number of new generics expected in 2024.

Interpretation

Spending on pharmaceuticals has grown considerably over the past two decades in Canada, leading to a total market size of more than $40 billion in 2023. The annual growth in spending reached 12.9% for retail estimated drug purchases and 17.7% for hospital estimated drug purchases in 2023, surpassing growth rates seen in the prior year (7% and 14.7%, respectively) and our forecasted growth rates (5.3% and 8.8%, respectively)[2]. This trend was apparent in both the retail and hospital sectors. The single annual decrease in retail spending in 2011 has been attributed to many brand name drugs losing exclusivity in that time period; however, trends in spending did not recede in the following years, likely due to the subsequent entry of many new "blockbuster" drugs, such as direct oral anticoagulants, various diabetes medications, and biologics.[24] In the retail sector, growth in annual spending reached the highest level in the past two decades. In the hospital sector, the growth was nearly as high as the record growth seen in 2019 due to expansion in the use of novel oncology treatments. This expansion in hospital spending is likely driven by new product approvals, higher market entry prices for new drugs, and growing utilization. For example, GLP-1 receptor agonists accounted for $1.4 billion in drug expenditures in 2023. Thus, we anticipate continued increases in the retail sector combined with accelerated growth in the hospital sector, leading to total annual estimated drug purchases nearing $54 billion by 2025. Importantly, the anticipated growth in the number of new therapies and associated costs will continue to put pressure on constrained government budgets across the country, leading to a need for strategies that balance access to novel therapeutics against limited resources.

It is expected that there will likely be pressure from growth of already-marketed drugs and other therapies identified in the pipeline to continue to impact the degree of change in spending in the coming years. Overall, we believe the growth in spending will be on the higher end of the predicted range in the outpatient

retail setting. There has been a significant increase in the use of the blockbuster drugs for T2DM and obesity (Ozempic and Wegovy semaglutide injections). We believe the use of these drugs has not yet peaked and was curbed by the global shortage that occurred between October 2022 and April 2024. Specifically, concerns about off-label prescribing of semaglutide for weight loss in individuals without T2DM resulted in worldwide shortages spanning this period. As Ozempic supply became stable, other GLP-1 receptor agonists and related drugs, such as dulaglutide and tirzepatide, faced a shortage. These shortages indicate semaglutide drug spending did not reach its peak in 2023. Because semaglutide was the drug with the highest spending in retail environments in 2023 even with shortages, it will likely be the single largest driver in terms of increased retail spending on medications in the coming years. Therefore, it is important to continue monitoring the use of GLP-1 receptor agonists, dulaglutide, and tirzepatide to ensure appropriate use and manage spending.

The adoption of biosimilar formulations has the greatest potential for reducing drug spending, but the degree of reduced spending depends on their uptake in Canada. Many public drug plans in Canada require patients who have not previously used biologics to be initiated on a biosimilar formulation. These plans have introduced mandatory nonmedical biosimilar switching policies over the past several years for select originator biologics.[17,18] In Ontario, Ontario Drug Benefit recipients who were on an originator biologic drug were required to transition to a Health Canada–approved biosimilar between March 31 and December 29, 2023, to maintain their medication coverage through the public drug program for the biologic drug.[17] Some of the highest drug spending in retail and hospital settings in 2023 was on biologics; given Ontario's large population (38% of the population in Canada), this policy is expected to influence national spending in the coming years.

Our analysis has limitations that warrant discussion. First, we do not have information on the confidential rebates that manufacturers provide to public and private drug plans or to hospital purchasers because these contracts are kept confidential. These discounts can be sizable; for example, pan-Canadian Pharmaceutical Alliance (pCPA) negotiations yielded $1.24 billion in savings in 2017–2018.[19] However, our results represent the total spending in the current drug system, and we do not anticipate major differences in the proportion of rebates to total spending in recent years. The purchase prices do account for up-front discounts. Rebates may be re-invested in paying for future drug spending and thus are paid forward in spending. Additionally, rising prices have important consequences on patient co-pays depending on payment method and plan structure.[20] Second, our data had no information on payers (i.e., public insurance, private insurance, or out-of-pocket) and thus only characterizes global spending and future impacts among all payers.

Conclusion

In 2023, overall estimated drug purchases in Canada rose more than anticipated, with similar trends observed in both the hospital and retail sectors. This growth was driven by increased utilization and the high costs of new therapies. These upward trends have persisted for several years, following the relatively flat growth experienced between 2009 and 2014. The rising costs, particularly for new treatments, underscore the ongoing need for rigorous assessment and price negotiation by public payers to ensure these expenditures provide good value for money. Additionally, the burden on uninsured individuals highlights the importance of addressing affordability and access for everyone living in Canada.

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Scratching the Surface: New Therapies, Incentivizing Medical Dermatology, and the Role of AI

A Conversation with Dr. Melinda Gooderham

Dr. Melinda Gooderham is a dermatologist, researcher, and educator, who has contributed to over 220 clinical trials in psoriasis, atopic dermatitis, hidradenitis suppurativa, alopecia areata, and vitiligo. She is the Medical Director at SKiN Centre for Dermatology, an Investigator with Probity Medical Research, Assistant Professor at Queens University, and Consultant Physician at Peterborough Regional Health Centre. She lives with her husband and three daughters in Peterborough, Ontario.

She spoke to Hypothesis publisher Rohit Khanna about the future of dermatology, her concerns about the dearth of medical dermatologists and the role of Artificial Intelligence (AI) in health care and research.

Who was your mentor that guided you towards dermatology?

My first mentor in dermatology was Dr. Lyn Guenther, who I met at Western University. I was already interested in the specialty when I met her. But in many ways, her career inspired my career. Like her, I do a lot of research, and I'm very involved in education, through hands-on training as well as lectures, in health care settings and at conferences around the world.

If you hadn't gone into dermatology, what was your second choice of specialty?

At the time, I was trying to decide between gynecology and dermatology, but after doing some dermatology electives, I knew dermatology was what I was meant to do. Looking back, if I couldn't do dermatology and I had to pick another specialty, I would probably do pathology, which I find fascinating. When you're a student and you want to go out and work with people and change the world, pathology doesn't seem very interesting. When you're practising, you realize how rich pathology is. It's a visual-based specialty where you're recognizing patterns, which is partly what attracted me to dermatology in the first place.

> ***"It's a visual-based specialty where you're recognizing patterns, which is partly what attracted me to dermatology in the first place."***

Recently, the Canadian Dermatology Association unveiled a groundbreaking paper entitled *More than Skin Deep: 5 solutions to managing Canada's dermatologist shortage and preventing wider patient impacts.* ***What recommendations most resonated with you?***

I work in an underserviced area, so I was interested in the CDA's recommendations for incentivizing younger dermatologists to leave the larger centers and practice in rural or suburban areas. I see many patients who have gone untreated, because they can't or won't travel to the big city. Ontario is a huge province, and dermatologists are concentrated in relatively small, urban areas.

Photo courtesy of freepik.com.

That's very true, and it's especially worrying that already underserved areas will be even more underserved in a generation or so when the predominantly older specialists in less populated regions retire. How can Canada get more medical students to choose dermatology?

The problem isn't that not enough medical students are choosing dermatology, because many choose it and don't get accepted into a residency position. The problem is that the government doesn't adequately fund dermatologists' training. In addition, out of 10 dermatologists graduating in a year, maybe only three or four will choose medical dermatology, and the rest will choose surgery and cosmetic dermatology. That means simply increasing the number of dermatology residency spots won't necessarily translate into more medical dermatology care. We need to better incentivize doctors to practice medical dermatology.

Can you share some of the in-development pharmacologic innovations for dermatologic disease that you're most excited about?

My specialty is immune-mediated inflammatory diseases, and there is a lot of exciting research in this area, especially in atopic dermatitis. Researchers are looking at targeting immune pathways more upstream to hopefully induce disease remission, instead of the more downstream types of therapies that require frequent ongoing dosing. A perfect example is the OX40-targeted therapies. In ongoing studies, patients have remained clear for a year after stopping therapy, and this remission could continue.

What I love about drug development is that when you target a pathway, you learn more about that pathway. In other words, drug development research helps us learn about the pathophysiology of disease. The hope is that, if we can treat diseases earlier in the course of the disease and put patients into remission, we could get close to a functional cure.

I'm also fascinated by the possibility of improving the safety of very targeted therapies, like JAK inhibitors. While these medications have made such a huge difference in patients' lives, some patients and prescribers have safety concerns. Research is focused on questions such as whether allosteric inhibition as a mechanism of action can reduce the side effect

profile, compared to competitive inhibition. We can manipulate molecules in so many ways now, so the question becomes, "How can we take these effective therapies and make them safer so that patients are more comfortable taking them?"

I've been reading quite a bit about the role of GLP-1 agonists and their potential use in the management of cutaneous disease. What are your thoughts?

I think GLP-1 agonists are so amazing, not just because they may treat inflammation, but also because they can help patients with their other cardiometabolic concerns, and even substance use. They're treating the whole patient in that sense. For example, I had a patient who I was treating for his psoriasis, who was started on a GLP-1 agonist for diabetes. He lost so much weight, and he told me his wife also lost 40 pounds because he's not having a beer after dinner with a bowl of chips, so she's not having a beer and a bowl of chips with him.

Dermatology is a very visual field, which makes it potentially ripe for AI transformation. Are you using AI currently in your day-to-day practice?

I use AI every day, but not from a diagnostic perspective. I use it for office management. I love my AI scribe. It's really improved my life. I'm fascinated with how I can have a conversation with a patient, and it will formulate a note and divide into sections, based on categories. It saves so much time in my day. I also like to use AI for generating patient handouts on a specific topic, like "Why is my atopic dermatitis not an allergy?" I can specify the grade level the report should be written to and then review it for accuracy.

Supposing we do get to a point where you're using AI to diagnose skin conditions, would you let patients know that AI was involved in their diagnosis?

Some countries are already informing patients of the use of AI in radiology imaging diagnostics. I think

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many patients appreciate that AI can detect things that a human couldn't detect. I already have my patients sign a consent form for the AI scribe to create their clinic note, and I've never had pushback from anyone about that.

I hope we don't have situations where AI is solely diagnosing patients. Instead, AI can help physicians see more patients and come up with more clear diagnoses.

You're a prolific author and medical journal editor. Should researchers declare if they have used AI to help them develop a manuscript?

We already have to declare our conflicts of interest with pharmaceutical companies. I think we should also declare the use of AI. Journals should include the question of whether AI was used in the research or the writing of the paper, as part of their standard list of questions for authors. If AI is being used to check grammar, I have no problem. However, I think there is a threshold of AI use in writing where we say, "That's no longer your work."

However, I think there is a threshold of AI use in writing where we say, "That's no longer your work."

My last question for you. What are you streaming or reading these days?

It used to be that everything I read was dermatology-related. Now, every night before I fall asleep, I read fiction. Right now, I'm reading *The Librarianist* by Patrick deWitt. It follows a librarian through different periods of his life, and I recommend it for anyone who enjoys the art of storytelling.

Melinda Gooderham, MD
Dr. Melinda Gooderham, Dermatologist and Medical Director at SKiN Centre for Dermatology, is also an Investigator at Probity Medical Research, Assistant Professor at Queens University, and Consultant Physician at Peterborough Regional Health Centre.

A fellow of the Royal College of Physicians and Surgeons of Canada, she has been an investigator in over 200 clinical trials focusing on inflammatory skin diseases including psoriasis and atopic dermatitis. Beyond clinical practice, Dr. Gooderham actively contributes to dermatology publications as an author, associate editor and reviewer, with authorship of over 200 articles. Her passion for education extends to global audiences through engaging lectures on innovative therapies for skin diseases.

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MAY 2025

Ankylosing Spondylitis Awareness Month
Bladder Cancer Awareness Month
Brain Tumour Awareness Month
Celiac Disease Awareness Month
Cystic Fibrosis Month
Food Allergy (Anaphylaxis) Awareness Month
Huntington Disease Awareness Month
Hypertension Awareness Month
Lupus Awareness Month
Melanoma and Skin Cancer Awareness Month
MS Awareness Month
Vision Health Month
National Physicians' Day – May 1*
Heart Failure Awareness Week – May 4 to 10
National Hospice Palliative Care Week – May 4 to 10
World Pulmonary Hypertension Day – May 5*
Mental Health Week – May 5 to 11
World Asthma Day – May 6
National Child and Youth Mental Health Day – May 7*
World Ovarian Cancer Day – May 8*
World Lupus Day – May 10*
Fibromyalgia Awareness Day – May 12*
International Awareness Day for Chronic Immunological and Neurological Diseases – May 12*
International Nurses Day – May 12*
National Nursing Week – May 12 to 18
Apraxia Awareness Day – May 14*
World Hypertension Day – May 17*
World IBD Day – May 19*
World Schizophrenia and Psychosis Day – May 24*
World Multiple Sclerosis Day (MS) – May 30*

Vision Health Month

During the month of May, people across Canada take the time to encourage pro-activity in maintaining their vision health and raise awareness on the importance of eye care.

Photo by David Travis via unsplash.com.

World Ovarian Cancer Day

May 8th is World Ovarian Cancer Day, a global movement to promote awareness and take action in solidarity with ovarian cancer survivors.

Photo by Kampus Production via pexels.com.

Source: www.canada.ca/en/health-canada/services/calendar-health-promotion-days.html
Events marked with an asterisk (*) take place on the same day every year.

JUNE 2025

JUNE

Migraine Awareness Month

June is Migraine Awareness Month a time to raise awareness and provide support to those living with this complex neurologic disease.

Photo by Karolina Grabowska via pexels.com.

ALS Awareness Month
Brain Injury Awareness Month
Canadian Men's Health Month
Cataract Awareness Month
CMV Awareness Month
Migraine Awareness Month
Spina Bifida and Hydrocephalus Awareness Month
World Environment Day – June 5*
Action Anxiety Day – June 10*
World Sickle Cell Day – June 19*
National Cancer Wellness Awareness Day – June 26*
PTSD Awareness Day – June 27*
World Scleroderma Day – June 29*

JULY 28

World Hepatitis Day

World Hepatitis Day is held every year on July 28th, in service of raising international awareness of viral hepatitis, its global impact and how to take action.

Photo by Frank Meriño via freepik.com.

JULY 2025

Glioblastoma Awareness Day – July 17*
National Drowning Prevention Week – July 20-26
Uterine Fibroid Awareness Day – July 21*
World Hepatitis Day – July 28*

AUGUST 2025

Gastroparesis Awareness Month
Spinal Muscular Atrophy Awareness Month
World PVNH Disorder Awareness Day – August 7*
International Overdose Awareness Day – August 31*

Source: www.canada.ca/en/health-canada/services/calendar-health-promotion-days.html
Events marked with an asterisk (*) take place on the same day every year.

Information on the Latest Drug Approvals and Reimbursement Milestones

Héma-Québec to reimburse **HyQvia®**, developed by **Takeda Canada Inc.**, for the treatment of immunodeficiencies in adult and pediatric patients over 2 years of age.

Regeneron Canada expands presence in Canada by opening its first headquarters to better serve needs of Canadians with serious diseases.

Health Canada authorizes **Roche Canada's Vabysmo®** (faricimab injection) pre-filled syringe (PFS) for three leading causes of vision loss.

Takeda Canada Inc.'s FRUZAQLA™ (fruquintinib) receives Health Canada market authorization for metastatic colorectal cancer (mCRC).

Health Canada approves **Otsuka** and **Lundbeck's (Pr) ABILIFY ASIMTUFII®** (aripiprazole), the first-and-only, once-every-two-months, long-acting injectable (LAI) treatment for schizophrenia and for maintenance monotherapy of bipolar I disorder in adults.

RYBREVANT®, developed by **Janssen Inc.**, plus chemotherapy approved in Canada as first and only targeted treatment to reduce risk of disease progression or death by more than half in second-line EGFR-mutated advanced lung cancer.

First patient in Ontario treated with publicly funded **Pluvicto™**, developed by **Novartis Pharmaceuticals Inc.**, in a major step forward for advanced prostate cancer care.

Astellas Pharma Canada Inc. receives Health Canada approval for **VYLOY®** (zolbetuximab) in combination with chemotherapy for advanced gastric and gastroesophageal junction cancer.

Health Canada authorizes **Itovebi®**, developed by **Roche Canada**, (inavolisib film-coated tablets), a targeted treatment for advanced hormone receptor-positive, HER2-negative breast cancer with a PIK3CA mutation.

ViiV Healthcare and the pan-Canadian Pharmaceutical Alliance (pCPA) successfully finalize negotiations for **APRETUDE** for HIV-1 Pre-Exposure Prophylaxis.

Novartis Pharmaceuticals Canada receives Health Canada approval for **Fabhalta®** oral treatment for adult patients with PNH.

Health Canada Approves **Merck's KEYTRUDA®** (pembrolizumab) for the treatment of adult patients with resectable Stage II, IIIA, or IIIB (T3-4N2) non-small cell lung carcinoma (NSCLC) in combination with platinum-containing chemotherapy as neoadjuvant treatment, and then continued as monotherapy as adjuvant treatment after surgery.

Boehringer Canada announces availability of **SPEVIGO®** for expanded indication in Canada.

Nova Scotia and Alberta provide public reimbursement for **Novartis Pharmaceuticals Canada's Pluvicto (TM)** for patients with advanced prostate cancer.

ACCRUFeR®, developed by **Kye Pharmaceuticals Inc.**, (ferric maltol) is now available in Canada as a prescription oral treatment for iron deficiency anemia.

Health Canada authorizes **Janssen Inc.'s LAZCLUZE®** (lazertinib) in combination with **RYBREVANT®** (amivantamab) as a first-line chemotherapy-free treatment for patients with EGFR-mutated advanced lung cancer.

Ferring Inc. receives Health Canada approval for **REBYOTA®** (fecal microbiota, live).

Libtayo® (cemiplimab for injection) letter of intent signed by **Regeneron Canada** and pan-Canadian Pharmaceutical Alliance for advanced non-small cell lung cancer and locally advanced basal cell carcinoma.

Quebec becomes first province to publicly reimburse **ViiV Healthcare's APRETUDE** for HIV-1 pre-exposure prophylaxis (PrEP).

SKYRIZI® (risankizumab) now available for moderately-to-severely active ulcerative colitis, expanding **AbbVie's** portfolio across inflammatory bowel disease.

QALSODY™ (tofersen injection) developed by **Biogen Canada**, receives conditional marketing authorization from Health Canada as the first ALS treatment targeting a genetic cause.

The Medical Device Market is A-Changin

A Conversation with Darran Fischer

When you think of Philips, Darran Fischer, managing director of Philips Canada, would like you to think about novel imaging technology and electronic medical record integration innovations. He spoke to Rohit Khanna, publisher of Hypothesis, about Philips' growing health system focus as well as how AI and environmental sustainability are shaking up the medical device market.

This interview has been edited and condensed.

Can you talk about the pathway that led to this point in your career?

I grew up in Southampton, Ontario, and completed a bachelor's degree in kinesiology and a master's degree in cardiovascular physiology at the University of Waterloo. After realizing there wasn't a clear path for me in academia, I got hired as an account manager at a medical equipment and supplies company, which was called KCI Medical at the time. For the past 11 years, I've been with Philips. I currently live in Newmarket with my wife, Amy, and our four children, who are all active in competitive sports. That keeps us very busy in the evenings and on weekends.

Most of our readers will be familiar with Philips products, from the Sonicare toothbrush to light bulbs. But they may be less aware of the medical side of the company. Can you provide a broad overview of Philips' operations in Canada?

Our head office is in Mississauga, and we have about 500 employees countrywide. We've received recognition as one of Toronto's Top Employers for six consecutive years now and we've recently appeared on Forbes' "Canada's Best Employers 2025" list and have made Forbes' "Canada's Best Employers for Diversity list'.

While you're right that most people associate Philips with light bulbs, in 2015, we divested from lighting to focus on healthcare technology. This includes personal care, such as toothbrushes, but also the health system side of the business. We're a major player in almost every hospital in Canada, in areas including cardiology, radiology, critical care, surgery, and more.

Philips is headquartered in Amsterdam. Do you think companies based in Europe have a different approach to business, compared to North American-based companies?

That's a lightning rod of a question! Joking aside, I think, compared to U.S.-headquartered companies, European-based companies have a deeper appreciation for socialized medicine and the way that health systems are organized in Canada, because our healthcare systems are so similar.

> ***"I'm also seeing a lot of interest in AI, in terms of how it can improve workflow and efficiency. We're passionate about trying to give back time to clinicians so they can do more for patients every day."***

Philips' products include MRI, ultrasound, patient monitors, and CT machines, as well as software platforms. Can you share some of the major trends you're seeing in the medical equipment business in Canada?

The pandemic resulted in a surge of demand for critical care monitors and ventilators. That was followed by a surge of new orders for imaging technology, to address

Photo courtesy of MART Productions from pexels.com.

the backlog of tests and surgeries. While there is still solid demand in the market, it's now levelled off. In Canada, hospitals are looking for ways to upgrade and maintain existing technology because there isn't a lot of money for capital replacements. There is an interest in looking at creative business models, with hospitals wanting to explore operational leases instead of ownership, for example.

I'm also seeing a lot of interest in AI, in terms of how it can improve workflow and efficiency. At Philips, we're passionate about trying to give back time to clinicians so they can do more for patients every day.

In Canada, we're not as mature from an electronic medical record perspective, but we're seeing more investment in information technology (IT), coast-to-coast. This brings opportunity for companies like Philips to improve interoperability and link patients' data together in one patient record, across health systems and, in some cases, across provinces.

Philips has been extremely innovative in a variety of areas, and one of those areas is helium-free technology. Can you talk about the advantages of helium-free technology for Canadian hospitals?

A conventional MRI system, which is a must-have in diagnostic imaging, requires between 1,500 and 2,000 liters of helium. The helium is necessary to cool the magnet. The challenge this poses is there is a dwindling global supply of helium. In addition, helium adds substantial weight, which limits where an MRI machine can be placed within the hospital. The cost of safely moving the helium in and out of the MRI machine can be upwards of a million dollars. If there is a rise in temperature in the magnetic coil, known as a 'quench,' that is devastating. It could be several weeks to get the MRI to back up and running.

Compared to this, our BlueSeal MRI uses only 7 liters of helium. It's a closed system, so the helium never has to be released or topped up. With a magnet that's 900 kg lighter than a traditional system, our MRI machine weighs far less than a conventional MRI and doesn't

require a quench pipe traditionally required for MRI systems to safely expel their large volume of helium out of a building quickly in case of an emergency. This means it can be placed anywhere in the hospital, and it can be moved when hospital managers wish to reconfigure space to improve workflow. Our BlueSeal system is also far more sustainable for the environment. Another benefit is that the scan time is faster. Our BlueSeal MRI provides up to 3x faster scanning with our SmartSpeed technology. We have installed 1,700 BlueSeal Ambition MRIs globally, and we're certainly a leader in this domain.

> ***"It's also critical to consider value across a care pathway when assessing a medical device. Some devices may be more expensive upfront, but they provide more value over the long-term by improving patient outcomes."***

It can take time for health systems to embrace new technology. How did you drive the adoption of the BlueSeal MRI?

It took time for people to understand the value proposition. The adoption was slow in the first 2 years, but it's picked up significantly since. Healthcare managers and leaders are having more conversations about sustainability, the cost of helium supplies, the cost of quench pipes, and the impacts of downtime. The impacts of downtime – both from a financial and patient care perspective – are considerable, given our wait lists in Canada.

Can you talk about any of the innovations we can expect from Philips Canada in the coming years?

We invest heavily in research and development (R&D), to the tune of $1.8 billion per year. Many people are familiar with our Picture, Archiving, Communication System (PACS), which uses AI to aggregate previous studies and reports. The system uses AI to speed up the radiologists' review times as well as to generate the report. PACS is a good example of one of our electronic medical records (EMR) interoperability solutions.

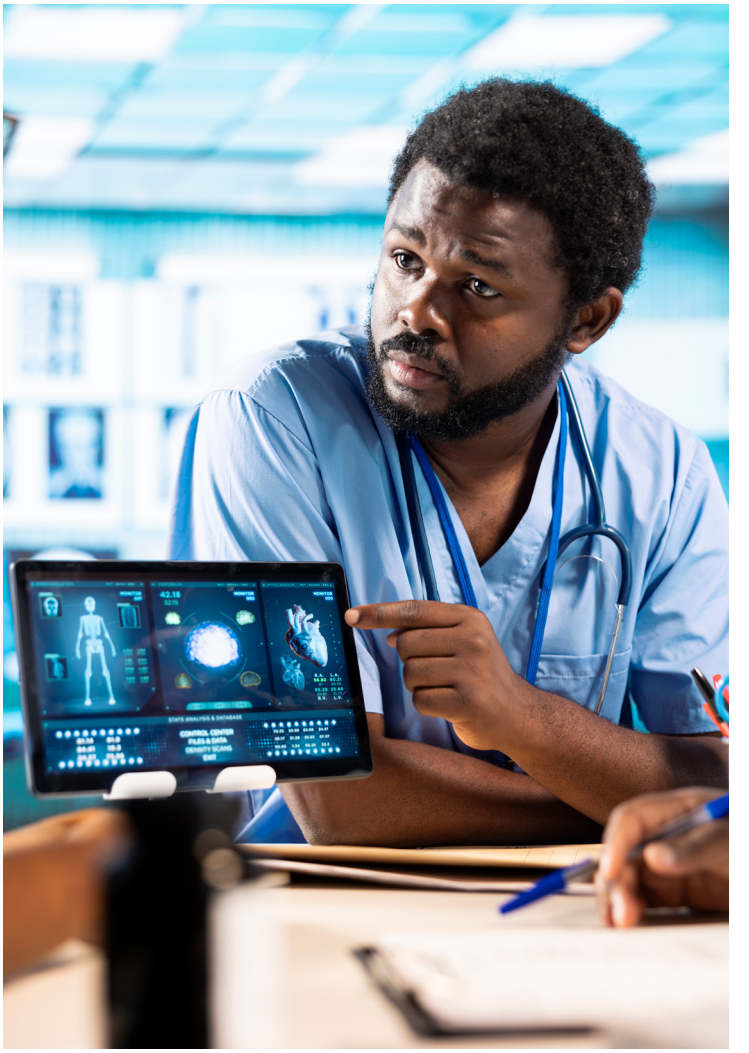

Photo courtesy DC Studio of freepik.com.

We also continue to advance cardiology and radiology IT systems as well. For example, our LumiGuide system uses Fiber Optic RealShape technology to reduce – and hopefully, someday eliminate – radiation during vascular surgery procedures. This innovation will take several years to come to market, but it's a very exciting technology.

> ***By adding AI predictive capability to the existing MRI, we're providing insights that allow clinicians to review MRIs more quickly and make faster treatment decisions.***

It's incredible to hear that Philips is working in these wide-ranging areas, including AI, EMR interoperability, and medical devices. I know the medical device market in Canada can be challenging. How do you think the procurement process for medical device equipment in Canada could be improved?

Canadian medical equipment is often replaced near the end of the lifespan of the equipment. Speed is paramount. Health authorities and hospital groups that are replacing equipment in a timely manner are ones that create a vendor of record. This allows for standardization as well as clinical choice.

It's also critical to consider value across a care pathway when assessing a medical device. Some devices may be more expensive upfront, but they provide more value over the long-term by improving patient outcomes. I think RFP assessments can, at times, too narrowly consider the short-term cost, without calculating the long-term value. I would also like to see sustainability be a more prominent aspect of RFP evaluations. Procurement offices should seriously assess what a device means for electricity consumption and waste, for example.

You recently posted on LinkedIn about how AI is helping Scarborough Health Network's Centenary Hospital to expand its imaging scan volume. Can you expand more on how AI is affecting patient care and outcomes?

In our pipeline, we're integrating AI into almost every piece of equipment and software. The Centenary site is a perfect example of how a simple software innovation can have a tremendous impact on the healthcare system. By adding AI predictive capability to the existing MRI, we're providing insights that allow clinicians to review MRIs more quickly and make faster treatment decisions.

Another example is our VitalEye product. A person's respiration can affect the quality of the MRI image, so we developed VitalEye, which is a camera on our MRI machine that uses AI to detect minor changes in respiration. This way, the image can be taken at the right moment to provide the clearest picture. AI is a tremendous asset, if harnessed in the right way.

My last question, who would you invite to dinner if you could invite any three people, dead or alive, and I'm paying the bill?

I am a passionate hockey fan, and a Leafs fan. I would want to have dinner with John Tavares. He's one of the last few humble, old school hockey players. I'm interested in his leadership journey, including his decision to give up the captaincy last year.

The next person I'd invite would be Mike Lazaridis, the inventor of the Blackberry, which transformed telecommunications. I'm always inspired by visionaries who can see things before they happen and can execute on that vision. I would be interested to hear about the growing pains that he worked through and what he learned along the way.

Lastly, I would invite Colin Powell. I was fortunate to hear him speak at an event. He spoke insightfully about the challenges and difficult decisions he had to make as National Security Advisor, Chairman of the Joint Chiefs of Staff, and then Secretary of State. I would want to hear more about the events that shaped his career, and how he developed his teams over the years.

Very interesting! Thank you so much for your time and I hope we can chat again soon.

Darran Fischer, Country Leader, Philips Canada
Darran Fischer is the Country Leader for Philips Canada and is a prominent member of Philips North America's executive leadership team.

As country leader for Philips, he strives to form strategic partnerships with healthcare organizations across Canada to deliver better care for more people and improve the clinician experience through meaningful innovation. Darran joined Philps in 2014 as the Director of Marketing and Sales Support and later became the Director of Sales for the Greater Toronto Area, Eastern Ontario and Atlantic region. In 2018, he moved into the position of Vice President of Sales before becoming Country Leader in 2022. He has over 16 years of experience in the MedTech industry, holding prior executive leadership roles in sales at ArjoHuntleigh and KCI Medical. Darran holds an MBA in Accounting and Finance from Wilfrid Laurier University and a MCs and BSs from the University of Waterloo for Kinesiology and Exercise Physiology. He resides in the Greater Toronto Area with his family of five.

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Raising Patient Voices: A Rare Disease Advocate Shares Her Journey From Despair to Advocacy

A Conversation with Alanna Yee

Alanna Yee is the Director of Research and Education Initiatives for the Sumaira Foundation, an international nonprofit organization that focuses on patients with neuroimmune diseases. She spoke to Hypothesis about the debilitating cognitive symptoms she experienced as a university student, her long medical journey, and the power of partnerships between patients, researchers, and the pharmaceutical industry.

You have a rare disease called autoimmune encephalitis. Can you talk about how it's affected you?

I was studying medical laboratory science at the University of Alberta when my symptoms began. I went from loving my studies, co-captaining my soccer team, and volunteering, to experiencing cognitive decline symptoms similar to dementia. I was only 21. It was very scary.

I suffered from verbal fluency problems, general confusion, and executive dysfunction. It once took me five whole days to clean my room. When I would pick up a shirt to put it in the hamper, I would stop mid-way, and think I was trying to change my outfit, for example. I went from being the top student in my program to losing the ability to hold down an entry level job. I saw many doctors over several years. Most thought that I had a psychological problem, like depression.

My family doctor didn't agree with that diagnosis and encouraged me to keep pursuing answers. Then, five years into my illness, I had an acute exacerbation that left me catatonic, and I was hospitalized. The consulting pediatric psychiatrist at the hospital was the first one to suspect autoimmune encephalitis (brain inflammation). She advocated for me to get appropriate care and continued to follow up with me after my hospital stay. She's a big source of inspiration for me. She stood her ground even when some of her colleagues dismissed the diagnosis and didn't think it was appropriate to proceed with immunotherapy treatments. The immunotherapy gave me my life back. It reversed an IQ point loss of over 30 points.

Your experience sounds very frightening, not to mention frustrating. Is it common for people with neuroimmune conditions to be misdiagnosed and dismissed within the health care system?

It's very common. In many cases, there are no clear pathways to get what you need as a rare disease patient. Each rare disease affects a small population (one in 12 Canadians has a rare disease), which is pretty significant. Many people with rare diseases are dismissed by doctors and face long diagnostic journeys and major barriers when accessing treatment.

Autoimmune encephalitis is not easy to diagnose, in part because up to 50% of people with autoimmune encephalitis don't test positive for auto antibodies. These experiences can cause medical trauma. I have personally experienced doctors questioning my diagnosis and discrediting my medical journey.

Do you think your science background helped or maybe hindered your approach to dealing with your illness?

> ***"My science background helped me advocate for myself when doctors questioned my diagnosis."***

It's been a huge benefit. When advocating for treatments, I could dig into the medical literature. When my therapies weren't adequately treating the inflammation, I advocated to start chemotherapy, which was not a decision some of my doctors were very comfortable with, but was ultimately the right decision.

Now I am in remission.

I'll add that my science background also helped me advocate for myself when doctors questioned my diagnosis, not only for treating my illness.

Are there any consensus guidelines available for the treatment of autoimmune encephalitis?

Canadian consensus guidelines were published last year. The field of autoimmune encephalitis research is very young. The condition was only discovered in the mid 2000s. Because the disease is so rare and newly-discovered, randomized, controlled trials (RCTs) are just getting underway, which is exciting for the community. Broadly speaking, the main treatment for autoimmune encephalitis is immunosuppression, to stop inflammation.

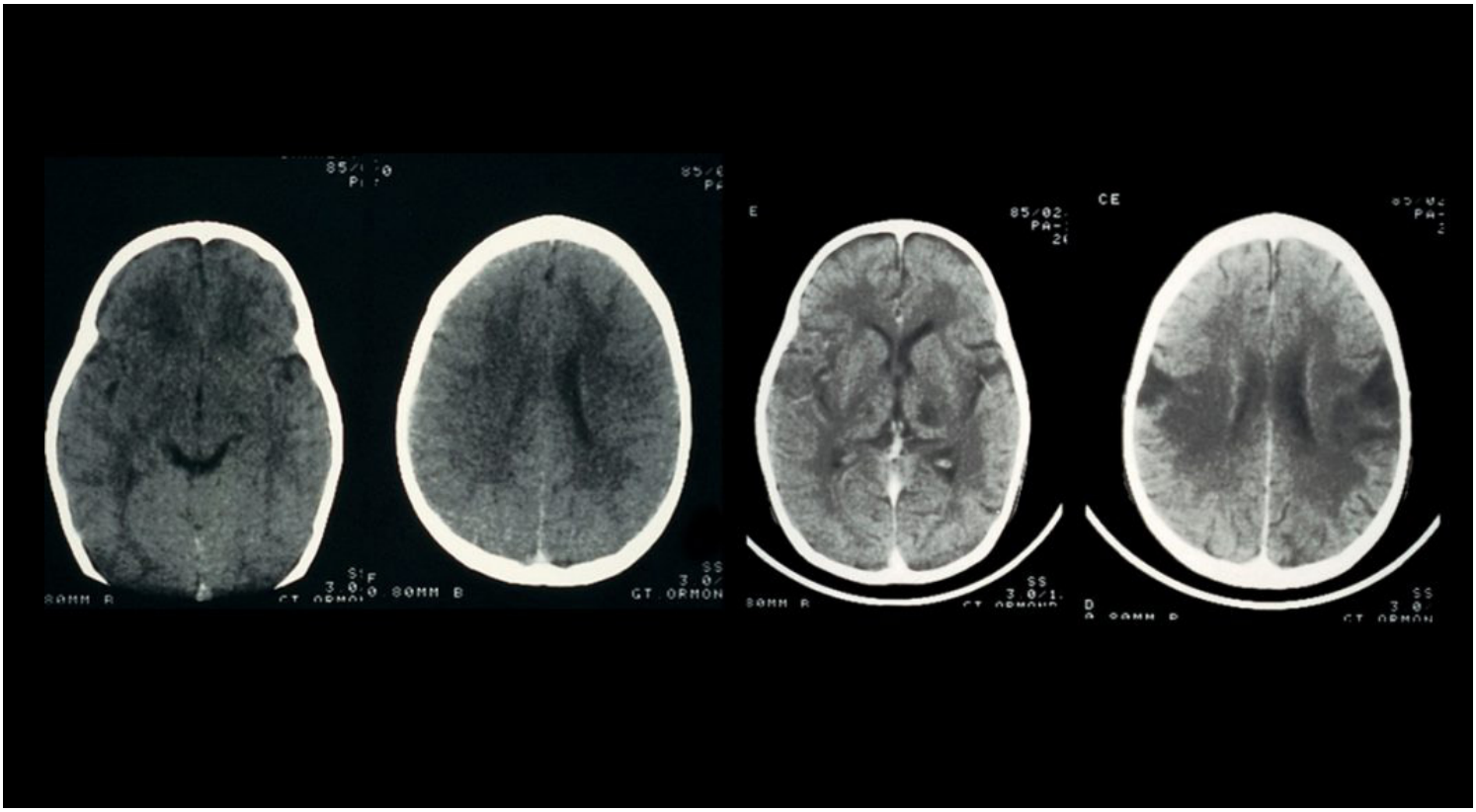

Photo by the Canadian Medical Association Journal via cmaj.ca.

Are treatments for autoimmune encephalitis covered by public or private insurance plans?

Getting access to treatment was a huge challenge for me. Whether my treatments would be publicly covered was dependent on the opinions of a few decision makers. Fortunately, the pediatric psychiatrist I mentioned earlier persisted, and cut through that red tape so I could get access to treatment.

I still hear about a lack of consistency across the country regarding what treatments autoimmune encephalitis patients can access. That is unfortunately common in the rare disease landscape in Canada. Access to treatment is often fragmented and dependent on where you live, who your doctor is, and how well your condition is understood by decision makers within the healthcare system.

I know the Sumaira Foundation is trying to change this. Can you tell me more about the work of the organization?

Sumaira Ahmed launched the foundation in 2014, shortly after she was diagnosed with neuromyelitis optica spectrum disorder (NMOSD), which is a neuroimmune condition similar to autoimmune encephalitis. The Sumaira Foundation has built a global community of patients, caregivers, clinicians, researchers, industry partners, and other stakeholders. We have a team of over 80 passionate ambassadors who have lived experience with neuroimmune conditions and volunteer their time to raise awareness about these diseases, and the need for research and accessible care.

Last year, we secured a $250,000 USD award to build our organizational research capacity. We are training patient ambassadors on the principles of medicine R&D. We're helping patient ambassadors develop the skills they need to represent the patient voice in academic environments. We have brought them together with a group of clinicians and researchers to collectively develop a research agenda for neuroimmune disorders. We expect to publish a report on that research agenda later this year.

The Sumaira Foundation is also advocating for public reimbursement of NMOSD therapies that have been recently approved by Health Canada.

How has the awareness of neuroimmune conditions changed in recent years, and where do you still see gaps?

Susannah Cahalan's book, *Brain on Fire*, was a game-changer. Her book describes her experience with autoimmune encephalitis, and it was made into a movie that is currently available on Netflix. Awareness is also growing through World Encephalitis Day, which has been recognized on February 22 since 2014. The lights on major landmarks across the world, including Niagara Falls and Edmonton's High Level Bridge, turn red. People also wear red and post on social media to raise awareness on World Encephalitis Day.

These awareness-building campaigns and ongoing research make a difference. When I talk with patients, I'm pleased to hear that people are getting diagnosed sooner, on average, compared to when I was diagnosed five years ago. I've heard people say that someone they know recommended they watch *Brain on Fire* because their loved one's symptoms sounded similar to Susannah's. That was what prompted them to request testing for autoimmune encephalitis.

We still need more awareness of the fact that autoimmune encephalitis is a spectrum of syndromes, rather than a single disease. It can present quite differently depending on the specific auto antibody that's involved. While textbook cases of autoimmune encephalitis are being recognized more readily, the range of presentations is still underappreciated. Textbook cases often involve seizures and movement abnormalities, however, cases like mine, with a subacute onset accompanied by few physical symptoms, are still too often misdiagnosed.

"We still need more awareness of the fact that autoimmune encephalitis is a spectrum of syndromes, rather than a single disease."

What more can industry do to help patients who have neuroimmune disorders?

I would encourage pharmaceutical companies and researchers to work on building long-term partnerships with the patient community. I have seen firsthand how engaging with patients early and often can lead to improved trial design, with more meaningful outcome measures or more feasible study visits. A well-designed study enhances trial recruitment.

Patient advocacy organizations can also help shape recruitment strategies and materials to make them more effective, because we know how to reach patients and we know which messaging resonates. Beyond clinical trials, the patient voice can make all the difference in accelerating market access and reimbursement. Finally, we can help with real-world adoption through patient education and by engaging healthcare providers.

It takes time to build trust with the patient community, so the long-term partnership piece is critical. Patients can see through engagement efforts that are transactional. Trust is built when representatives of a pharmaceutical company show up before, during and after clinical trials and drug approval.

Alanna Yee

Alanna Yee is a rare disease patient advocate from Edmonton, Alberta. Having overcome a five-year diagnostic odyssey and successfully reversing a disabling cognitive decline caused by autoimmune encephalitis, she is dedicated to ensuring that others facing rare neuroimmune conditions receive timely diagnoses and equitable access to treatment. With a professional background in medical laboratory science, communications, and political advocacy, she takes a multidisciplinary approach to her work. As Director of Research & Education Initiatives at The Sumaira Foundation, Alanna leads efforts to build capacity for patient engagement in research, develop educational resources, and foster collaborations that strengthen the bridge between patients, researchers, clinicians, industry, policymakers, and other stakeholders.

THE Sumaira FOUNDATION

The Sumaira Foundation (TSF) is an international patient advocacy organization dedicated to raising global awareness of rare neuroimmune conditions, building communities of support for patients and their caregivers, supporting research and fellowships, and advocating for patients. At the heart of TSF's work is its global ambassador program, a diverse and dynamic network of over 80 individuals affected by neuroimmune diseases who play a pivotal role in amplifying the patient voice and driving advocacy efforts across the rare disease community. TSF Canada is a registered charity.

To learn more about TSF, please visit **www.sumairafoundation.org**.

Who's Doing What and Who's Going Where

Kally Yannopoulos has started a new position as Oncology Lead, Sales & Marketing at ***Bristol Myers Squibb***.

Dominic Béliveau has joined ***AbbVie*** as the Oncology Therapy Specialist.

Julia Verreault has taken up a new role as Marketing Associate (Oncology) at ***Merck***.

Sharath Ramesha has assumed the role of Director, Portfolio & Capacity Management (Aggregate Planning) at ***AstraZeneca***.

Alex Rizzuti is now the Senior Brand Manager (Ophthalmology) at ***Sun Pharma***.

Brad Donoff has started a new position as Director of Commercial Excellence with ***Fresenius Kabi***.

Niko Tzakis has joined ***Eli Lilly and Company*** as the Medical Science Liaison in Oncology.

Stephen Ackerman has taken up a new role as Commercial Lead for ADHD at ***Kye Pharmaceuticals***.

Sarah Hui has embarked on a new role as National Medical Education Manager of Oncology at ***Eli Lilly and Company***.

Bonnie Rodriguez has started a new position as the National Ecosystem Manager (Transplant) at ***Sanofi***.

Adnan Darr has assumed the role of Territory Manager at ***Abbott Rapid Diagnostics***.

Lindsay Martin has taken up a new role as District Business Manager at ***Novo Nordisk***.

Susan Carinci has just joined ***Kye Pharmaceuticals*** as Medical Sales Representative.

Alain Lamontagne is starting a new position as Vice President Global Medical Affairs at ***Taysha Gene Therapies***.

Genevieve Arsenault is now the Medical Science Liaison for ***Arcutis Canada.***

Olivia Dalton-Jez joined ***Amgen*** as Marketer, Rare Disease-TED.

Christa Johnson is starting a new position as National Director of Surgical Sales at ***Alcon***.

Kent Stevens is taken up a new role as Therapeutic Sales Specialist at ***Arcutis Biotherapeutics, Inc.***

Julie Lederer has joined ***Biogen*** as a Senior Marketing Manager on the Rare Disease Team.

Kerri Paranosic has embarked on a new role at ***Amgen*** as an Account Development Representative (Community).

Emma Davis has been promoted to Senior Associate - Forecasting and Market Insights at ***Eli Lilly and Company.***

Debbie King has started a new role as Head of Business Intelligence & Operations and Biosimilars at ***Biogen Canada***.

Shawna Boynton has has taken up a new role at ***Galderma*** as Director, Marketing (Aesthetics).

Please submit your selection for our "People on the Move" section, celebrating the advancements of your colleagues, for upcoming issues via email to info@catalytichealth.com.

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