Canadian Society of Healthcare-Systems Pharmacy

Société canadienne de pharmacie dans les réseaux de la santé

2023/24 Hospital Pharmacy in Canada Survey

23rd Edition

Hospital Pharmacy in Canada

Survey Report **2023/24**

Hospital Pharmacy in Canada Survey Board

Canadian Society of Healthcare-Systems Pharmacy

Société canadienne de pharmacie dans les réseaux de la santé

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The Hospital Pharmacy in Canada Survey Board is an affiliated board of the Canadian Society of Healthcare-Systems Pharmacy.

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Managing Editor
Carolyn Dittmar, Cameron, Ontario

Copy Editor
Peggy Robinson, Ottawa, Ontario

Reviseur
Martine Picard, Montreal, Quebec (Survey Questions)
Anne-Marie Mesa, Lavaltrie, Quebec (Survey Report)

Survey provider and publication design
Leger Marketing Inc., Toronto, Ontario

Translation services
Leger Marketing Inc., Toronto, Ontario

Photos

COVER:
Pharmacist Ethan Swanson (RPh) and pharmacy technician Pam Fode (RPhT) are members of the Medicine Hat Regional Hospital Emergency Department clinical team in Medicine Hat. [Photo credit: Alberta Health Services]

PAGE 17:
Amanda Leong (RPh) is an ICU pharmacist working at the Foothills Medical Centre in Calgary, Alberta [Photo Credit: Amanda Leong, Alberta Health Services]

PAGE 24:
Olivia Perry (RPh) is a Clinical Pharmacist in the Ambulatory Medical Oncology at the Dr. H. Bliss Murphy Cancer Centre in St John's, Newfoundland. [Photo Credit: Olivia Perry, St John's, Newfoundland]

Special Thanks

The HPC Survey Board would also like to thank:

- the staff of hospital pharmacy departments across Canada who provided data from their respective facilities and committed the time to complete the survey, and
- the Canadian Society of Healthcare-Systems Pharmacy (CSHP), its Board, and its staff for their support of this survey.

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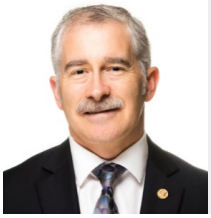
Hospital Pharmacy in Canada
Survey Board



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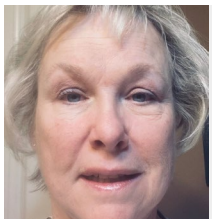

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Forewords

The 2023/24 edition of the Hospital Pharmacy in Canada (HPC) Survey marks both a continuation and a new chapter. While it remains the most comprehensive source of data on hospital pharmacy practice in Canada, this report is the first to be published under our Society's new name—**Canadian Society of Healthcare-Systems Pharmacy**—and within the framework of our renewed Strategic Plan.

This evolution in identity and direction mirrors the transformation taking place in healthcare and pharmacy practice across the country. Today's healthcare-system pharmacy teams are not only medication experts but also integral contributors to interprofessional care, champions of safety and quality, and innovators in service delivery. The HPC Survey provides the data needed to document this evolution and support continued progress. It serves as an essential evidence base for advocacy, education, benchmarking, and planning at all levels—from individual departments to national policy.

The new **three-year publication cycle** represents a deliberate and thoughtful shift. It allows time for meaningful survey design, rigorous data collection and analysis, and—most critically—knowledge translation and mobilization. This cycle ensures that the HPC Survey not only reflects current practice but also fuels continuous improvement across the profession.

The HPC Survey is especially important at this moment in our evolution as a Society. In adopting the name **Canadian Society of Healthcare-Systems Pharmacy**, we recognize the connectivity and complexity of our plural healthcare systems across the country. Our new mission and vision reflect a profound shift—from an inward focus on the profession itself to an outward commitment to the people and systems we serve. We are no longer defined solely by where we work, but by the impact we seek to make across all care settings. The HPC Survey provides the evidence base to help realize this ambition. Its findings support our **values**: they drive innovation, uphold inclusivity, promote sustainability, focus on patients, and enable knowledge sharing. This report doesn't just reflect our profession—it equips us to lead its future with clarity, confidence, and purpose.

This edition would not have been possible without the leadership of the volunteer Hospital Pharmacy in Canada Survey Board and the hundreds of pharmacy professionals across the country who contributed data, shared perspectives, and upheld the integrity of the process. Your commitment is what gives this report its value and influence.

We are also deeply grateful to our sponsors—**Pfizer**, **Pharmascience**, and, for the first time, **Apotex**—for their generous support and shared commitment to advancing pharmacy practice through knowledge.

As we enter this new era of CSHP, the Hospital Pharmacy in Canada Survey continues to be a cornerstone of our collective progress. We invite readers to explore its findings, apply its insights, and share in the ongoing effort to build stronger pharmacy services and healthier systems.

Jody Ciufo
Former Chief Executive Officer
Canadian Society of Healthcare-Systems Pharmacy

Pfizer Canada is pleased to continue supporting the Hospital Pharmacy in Canada Survey Report. This is an important tool for Canadian hospital pharmacy leaders to understand, identify, and to share information on clinical and administrative practices within their institutions. By doing so, the hospital pharmacy profession can continue to flourish through advancements and best practices.

The extensive participation from the hospital pharmacy departments across Canada, that responded to the 2023-24 Hospital Pharmacy in Canada Survey, is a testimony to the quality and value of this initiative. Pfizer Canada is delighted to continue to have the opportunity to contribute to this valuable national effort, that truly brings hospital pharmacist leaders together to achieve a common goal: putting patients first.

Ranjita Banerjee
Commercial Director, Promoted Brands
Pfizer Canada

Apotex is proud to be a long-standing supporter of the Canadian Society of Healthcare-Systems Pharmacy (CSHP), working together to advance excellence in pharmacy practice and improve patient outcomes across the country. Our shared commitment to better health is rooted in action—supporting initiatives like the Hospital Pharmacy in Canada Survey Report, which fosters collaboration, knowledge-sharing, and innovation among hospital pharmacy leaders. At Apotex, we believe that making health happen together means more than just providing medicines—it means building strong partnerships with healthcare professionals, communities, and organizations like CSHP that are shaping the future of care.

APOTEX

As a trusted provider of one in five prescriptions dispensed in Canada, and a leader in pharmaceutical local manufacturing and innovation, Apotex is purpose-built for better health. Our impact is driven by a deep sense of responsibility—to expand access to affordable, high-quality medicines and to support the professionals who deliver care every day. Guided by integrity, compassion, and a shared purpose, we are proud to stand with CSHP and the hospital pharmacy community in their mission to elevate practice and put patients first. Together, we are a force for health—committed to transforming care and improving lives from coast to coast.

Christine Renaud
Director | Hospital & Specialty Channel Sales
Apotex Inc.

pharma science

At Pharmascience, we are proud to support the Hospital Pharmacy in Canada Survey Report—a vital resource that reflects the evolving realities, challenges, and innovations within hospital pharmacy practice across the country.

This sponsorship is more than a gesture; it is a reflection of our DNA. Pharmascience was built on a foundation of partnership, innovation, and a deep commitment to patient care. We believe that by investing in knowledge and supporting the pharmacy community, we contribute meaningfully to the advancement of healthcare in Canada.

The insights captured in this report inform better decisions, foster collaboration, and ultimately help improve patient outcomes. As a Canadian company with a strong institutional presence, we are honoured to stand alongside hospital pharmacists in their mission to deliver safe, effective, and accessible care.

We thank the HPC Survey Board, contributors and readers of this report for their dedication to excellence. Together, we are building a stronger, more resilient healthcare system—one informed decision at a time.

Jean-François Laporte,
National Hospital Commercial Director
Pharmascience Canada

Introduction

Douglas Doucette

The **CSHP Hospital Pharmacy in Canada Survey Report 2023/24** is the 23rd edition of this national report and the first published under the Society's new name, Canadian Society of Healthcare-Systems Pharmacy. As the report's Executive Editor, it has been my privilege to work with an outstanding team of editors on the Hospital Pharmacy in Canada Survey Board, many of whom are new since the previous report (published in 2022). Among those returning for this round of the survey and report were Carolyn Dittmar (Managing Editor), André Bonnici, Allan Mills, Bal Dhillon and Jody Ciufo (CEO of CSHP) as Board Liaison. By the time this report is published, Jody will have retired as CSHP's CEO, a position she held since 2019. We wish Jody all the best in her well-deserved retirement!

The 2023/24 report also comes with a few "firsts". Leger Healthcare was newly contracted to develop the online survey tool and to collect data from respondents who completed the Large Hospital Survey (LHS) and the Small Hospital Survey (SHS). In addition, we welcomed back Alberta (AB) respondents for the 2023/24 survey, who were unable to participate in the 2020/21 survey due to the implementation of a new provincial health informatics system. In reports up to 2016/17, data from AB were grouped with results from Saskatchewan (SK) and Manitoba (MB), as the Prairie region; however, in the 2020/21 report, Prairie data were limited to SK and MB. With the return of AB participation for 2023/24, the survey board decided to report AB data separately (like data from the larger provinces of British Columbia [BC], Ontario [ON] and Québec [QC]), with results from SK and MB combined as SK/MB. This approach will continue in future survey reports. Importantly, an editor from AB, Megan Wisnowski, was appointed to the board for this iteration of the report, and AB will continue to have board representation in the future.

This report continues to present results from both adult and pediatric facilities. We thank the six participating pediatric centres for responding to the 2023/24 survey: Children's and Women's Health Centre of BC, Vancouver, BC; Alberta Children's Hospital, Calgary, AB; Children's Hospital of Eastern Ontario (CHEO), Ottawa, ON; Centre hospitalier universitaire (CHU) Sainte-Justine, Montréal, QC; IWK Health Centre, Halifax, Nova Scotia (NS); and Janeway Children's Health and Rehabilitation Centre, St. John's, Newfoundland and Labrador (NL).

A – Demographics. In this chapter, I provide an overview of the facilities from across Canada that responded to the survey. Where results are reported on a regional basis, SK and MB are combined (as noted above), and the Atlantic region consists of New Brunswick, Prince Edward Island, NS and NL. There were no respondents from any facilities in the territories for the 2023/24 survey.

B - Clinical Pharmacy Practice, was written by Megan Wisnowski. This chapter provides valuable insights into the allocation of clinical pharmacist resources, the clinical practice models in use and involvement of pharmacists in specialized stewardship programs. It also examines how pharmacy clinical programs are evaluated and how medication-related outcomes are measured.

C - Drug Distribution Systems, written by Allan Mills, focuses on medication preparation and dispensing,

the use of automated dispensing cabinets, pharmacy hours of operation, processes used to compound sterile non-hazardous and hazardous medications, product traceability, and inventory management as elements of medication distribution. A new question in the 2023/24 survey inquired about the support that inpatient pharmacy departments provide to outpatients as a means of understanding how healthcare-systems pharmacies support the community.

D - Human Resources, written by André Bonnici, aims to assist leaders in understanding the structure of the hospital pharmacy workforce in Canada. It provides insight into hospital workforce distribution between pharmacy staff and managers, full-time equivalents (FTEs) as a function of patient days and inpatient or outpatient practice environment, vacancy rates, and salaries of pharmacy professionals and management. This survey report includes, for the first time, the average ratio of FTEs per 100 acute care beds for various categories of pharmacy staff.

E – Benchmarking, was co-authored by Hélène Paradis and Sammu Dhaliwall. Benchmarking provides workforce metrics, such as staffing ratios per bed, per patient day and per admission across various clinical services and programs, as well as drug costs associated with pharmacy services for specific patient care programs. The 2023/24 survey asked respondents to report paid hours rather than budgeted hours, to more accurately represent staffing levels by accounting for absenteeism, vacancies and workload variability. This shift in reporting enables more meaningful benchmarking, particularly in the context of rising acuity and evolving service models.

F - Pharmacy Technician Practice, written by Bal Dhillon, our regulated pharmacy technician on the board, examines the role of pharmacy technicians and pharmacy assistants working in collaboration with others to ensure safe, effective and patient-centred medication management. It explores workforce trends, interprofessional collaboration and best practices to illustrate how the pharmacy profession is evolving to meet modern healthcare demands. This chapter highlights current practices and identifies strategies to optimize pharmacy technician roles in support of patient care, medication safety and workforce sustainability.

In G – Technology, Alicia Wall outlines the state of health information systems integration across Canada relevant to hospital pharmacy practice, including the adoption of electronic health records, the implementation and functionality of computerized provider order entry systems, and the use of closed-loop medication management systems (for the first time), barcoding and smart infusion pumps. The chapter also provides insights into the human resources associated with developing and maintaining such systems and highlights emerging technologies in healthcare-systems pharmacy.

In H - Hot Topics in 2023/24, co-authors Spencer Tuttle and Allan Mills highlight how pharmacy departments in both large and small hospitals are responding to challenges related to the environment, emergency preparedness, digital transformation and disruptions in the pharmaceutical supply chain.

I - Small Hospital Survey, was co-authored by Shannan Neubauer and Sammu Dhaliwall. This is the second edition of the CSHP Hospital Pharmacy in Canada Survey that includes the SHS. For purposes of our survey, small hospitals are defined as those with fewer than 50 acute care beds, which now account for approximately half of the 602 Canadian hospitals that were documented by the Canadian Institute for Health Information in 2022/23.[1] This chapter assists the reader to better understand the challenges and opportunities associated with small hospital pharmacy practice, relative to the established history of the LHS, providing information that will help to identify trends for this smaller pharmacy practice setting. The SHS response rate increased this year because of the participation of small hospitals in AB.

Past editions of the CSHP Hospital Pharmacy in Canada Survey Report can be accessed on the CSHP website at Published HPC Survey Reports.

At this point, I'd like to recognize the contributions of Jean-François Bussières, formerly the director of

pharmacy with the CHU Sainte-Justine in Montréal, QC, who left the board after publication of the 2020/21 report. Jean-François, or JF as he is known, was the longest-serving editor on the Hospital Pharmacy in Canada Survey Board, having joined in 1996. He left the survey board in 2023 when he retired from CHU Sainte-Justine. JF's boundless enthusiasm and ideas helped to fuel the group's collective energy during our (at times) lengthy editorial board meetings and seminars. Along with his dedication and work ethic, JF kept us smiling and laughing with his sense of humour during our breaks and meals.

More recently, we have welcomed several new members to the survey board, all of whom contributed to the current report:

- Spencer Tuttle, from BC, replacing Richard Jones as representative for BC (Richard Jones also served as Executive Editor)
- Megan Wisnowski, from AB, as the first-ever representative for AB
- Shannan Neubauer, from SK, replacing Kyle McNair as representative for SK/MB and for small hospitals
- Sammu Dhaliwall, from ON, replacing Edith Rolko as representative for ON
- Hélène Paradis, from QC, replacing JF Bussières as representative for QC
- Alicia Wall, from NL, replacing me as representative for the Atlantic region

In closing, I would like to acknowledge Kevin Hall, who joined what was then known as the Hospital Pharmacy in Canada Editorial Board in the mid-1990s and served as Managing Editor from 2005/06 to 2013/14. Kevin was recognized as a visionary leader in our profession, having been a clinical pharmacist, director of pharmacy, lecturer and professor of pharmacy, researcher and author. He was president of and branch delegate for the CSHP Manitoba Branch, president of CSHP (1986/87), a CSHP Fellow and recipient of the CSHP Distinguished Service Award (1996). Along with numerous other professional awards and recognitions, Kevin also served as president of the Canadian Pharmacists Association in 1994/95.[2] In addition to his many accomplishments, Kevin was also known for warmly welcoming new members to the various committees and boards on which he served, and for actively mentoring learners and new staff. Kevin passed away on November 14, 2023, at age 69, and is missed by his family, friends and colleagues.

As Executive Editor, I am grateful to all survey board members who have contributed to this report. I am also grateful for the insight and guidance of the many past board members with whom I have worked on previous survey reports.

Douglas Doucette
Executive Editor

1. Hospital beds staffed and in operation, 2022–2023 [Excel spreadsheet]. Ottawa, ON: Canadian Institute for Health Information; 2024 [cited 2025 June 25]. Available from: https://www.cihi.ca/en/hospital-beds-staffed-and-in-operation-2022-2023
2. In memoriam: Kevin Hall. Ottawa, ON: Canadian Society of Healthcare-Systems Pharmacy; 2023 Nov 23 [cited 2025 Aug 30]. Available from: https://www.cshp.ca/website/Content/News/news-items/in-memoriam-tribute-kevin-hall.aspx?WebsiteKey=0c648ab0-50ba-4f43-9d77-13eecc1832e4

Methodology (Data Collection and Analysis)

Carolyn Dittmar and Leger Healthcare

The CSHP Hospital Pharmacy in Canada Survey is a descriptive cross-sectional survey. The objective of the current survey iteration was to establish a profile of hospital pharmacy practice in Canada for the year April 1, 2023, to March 31, 2024, in both large and small hospitals (where small hospitals were defined as having fewer than 50 acute care beds). Participation in this survey was voluntary.

Design of Questionnaire and Online Survey

The CSHP Hospital Pharmacy in Canada Survey had two components, based on the respondent's number of acute care beds as of March 31, 2024. The Large Hospital Survey (LHS) targeted the pharmacies of Canadian facilities with at least 50 acute care beds. For the second time, small hospitals (those with fewer than 50 acute care beds) were invited to complete a shorter survey (the Small Hospital Survey, SHS). The survey was launched on September 17, 2024, for a small sample of respondents who volunteered to test the online survey functionality. On October 17, 2024, the survey was fully launched for all remaining potential respondents.

The CSHP Hospital Pharmacy in Canada Survey Board held several meetings in 2023 and 2024 to confirm the questions that would appear in each of the two survey components (LHS and SHS). Question development included reviewing the wording used in previous surveys to allow trending analysis of the results. Some questions were modified for simplification or clarity, and some new questions, including those in Chapter H - Hot Topics, were added to the 2023/24 survey. The survey questions (see Appendix V - Survey Questions) and pertinent definitions (see Appendix IV - Definitions) were reviewed and approved by the survey board, and were then translated into French.

The survey opened with an introductory section (4 questions) to collect some basic information about the respondent and their facility, as well as to identify the number of acute care beds in the facility. Facilities with 50 or more acute care beds were then directed to the LHS, whereas those with fewer than 50 acute care beds were directed to the SHS.

The LHS consisted of eight sections with a total of 125 questions, as follows:

Section A: Hospital Information (5 questions)
Section B: Clinical Pharmacy Practice (20 questions)
Section C: Drug Distribution Systems (35 questions)
Section D: Pharmacy Human Resources (6 questions)
Section E: Benchmarking (9 questions)
Section F: Pharmacy Technician Practice (18 questions)
Section G: Technology (11 questions)
Section H: Hot topics (21 questions)

The SHS consisted of two sections with a total of 39 questions, as follows:

Section I: Small Hospital (18 questions)
Section H: Hot topics (21 questions)

Each question could include one or more sub-questions. The surveys were preceded by detailed instructions, and the definitions of key terms were provided at the start of each section. (Definitions

were also available through a "hover over" feature of the online survey.) At the end of each section of the survey (excluding Section H, Hot Topics in 2023/24), respondents had the option of providing comments or feedback, and a final comment option was available at the end of each survey.

The online tool used for the 2023/24 survey was programmed by Leger Healthcare. The LHS and SHS were developed using the Forsta Survey tool (https://www.forsta.com/platform/survey-software/online-survey-software/). The email communications and questionnaires were provided in both English and French. All respondents were able to view the questionnaires in either language to confirm their understanding of the questions and definitions. Respondents to the LHS with multiple sites or facilities had the opportunity to answer a single questionnaire for their entire organization or a separate questionnaire for each individual site. In these cases, one email invitation for the entire organization was provided (with a unique link), along with multiple separate email invitations offering a link for each of their individual facilities.

The survey software was programmed to require each respondent to answer all four questions in the introductory section (specifying facility name and contact information), as well as the first two questions in Section A, Hospital Information (providing the number of acute care beds and acute care inpatient days). Respondents reporting fewer than 50 acute care beds were directed to the SHS and were subsequently not permitted to access the LHS, while those reporting 50 or more acute care beds were directed to the LHS and were not able to access the SHS. After those first four mandatory responses, the respondent could leave survey questions unanswered.

The online survey was programmed to allow respondents to go back and forth between questions as needed. For the LHS specifically, a "table of contents" was presented, containing a link to each section of the survey. Respondents could complete and submit each section of the survey in any order they chose and could return to the "table of contents" at any time to navigate between sections. However, once a given section was submitted, respondents could no longer access that section of the survey.

To simplify data collection and analysis, a period (".") was used to represent the decimal character, although in French, a comma is normally used for this purpose.

Initially, the survey deadline was December 11, 2024, but this was extended to midnight on January 6, 2025, due to problems with receipt of survey links reported by many respondents, as described below.

Respondents were given the option to request, by email, a copy of their survey responses upon completion of the survey (for their future reference). This information was provided by Leger Healthcare in the form of an Excel document.

Survey Population

Members of the CSHP Hospital Pharmacy in Canada Survey Board (listed on page 5) reviewed the list of Canadian healthcare facilities that were invited to participate in the 2023/24 survey, along with contact information for their respective pharmacy departments and CEOs. Each board member reviewed the list for their particular region to ensure accuracy in terms of facility names, pharmacy contact names and email addresses, and CEO names and email addresses (with CEO information being collected for LHS respondents only). All healthcare facilities with fewer than 50 acute care beds were eligible for this survey, even if they were part of a larger healthcare organization (e.g., in Québec, where every small hospital is also part of a larger healthcare facility). The final list consisted of 259 potential large hospital respondents and 332 potential small hospital respondents, based on facility and pharmacy contact information gathered for previous surveys, in addition to the Canadian Institute for Health Information's document entitled "Hospital Beds Staffed

and in Operation 2022-2023".[1]

Alberta was unable to participate in the 2020/21 survey due to the implementation of a province-wide clinical information system. We are happy that they were able to participate in the 2023/24 survey.

Specialty facilities, such as oncology centers, mental health facilities and rehabilitation centers, were not invited to participate. Historically, this type of facility has been excluded because the staffing and programs provided for their specialty patient care programs might skew the data when pooled with information from general hospitals.

Recruitment

On September 17, 2024, email invitations with a unique hyperlink to the online survey were sent to a small sample of potential respondents for both surveys (9 LHS and 21 SHS respondents), to test the functionality of the online survey. The full roll-out began a month later. On October 15, 2024, the Canadian Society of Healthcare-Systems Pharmacy (CSHP) CSHP sent an email to the CEOs of the potential large hospital respondents, notifying them of the launch of the national survey and its value and encouraging their organizations' participation. The next day, October 16, 2024, CSHP sent emails to all potential LHS and SHS respondents, informing them that the 2023/24 survey would be launched in the next few days and advising that a survey link would be sent to them by email from Leger Healthcare. On October 17, 2024, a second email was sent to LHS respondents only, with details about data in the survey that respondents might have to request from other hospital departments before they could complete the survey. On the same day, October 17, 2024, the survey was officially launched when Leger Healthcare began sending an email to each potential respondent with their unique hyperlink to the survey. These invitations were sent out and managed using a program called Voxco (https://www.voxco.com/voxco-online).

A webinar, entitled "How to Complete the Hospital Pharmacy in Canada 2023/24 Survey", was hosted by CSHP on October 16, 2024. It was recorded and posted for viewing on the CSHP website, with access open to all. The survey questions, definitions and a list of the survey data that might need to be requested from other hospital departments were also posted on the CSHP website.

Some email messages containing unique survey hyperlinks bounced back. When this occurred, efforts were made by all survey board members to identify someone at the particular facility to complete the online survey.

On November 4, 2024, more than two weeks after the official launch, it was noticed that 559 potential survey respondents had not yet logged into the online survey. Survey board members contacted potential respondents in their respective areas to ask whether they had received the email from Leger Healthcare with their unique survey link. Unfortunately, it appeared that emails from Leger Healthcare were diverted or blocked by facility firewalls in many cases. Based on information provided by Leger, CSHP sent emails in early November to all 559 respondents who had not yet logged into the survey, including their unique hyperlink to the survey. It was hoped that this additional invitation would increase the number of survey responses.

On November 22, 2024, information from Leger Healthcare indicated that 450 potential respondents had still not logged into the online survey. CSHP re-sent the unique hyperlinks for the survey to those non-respondents. Given the initially low response rate, the survey deadline was pushed back to January 6, 2025. Survey board members again reached out to their colleagues to confirm receipt of the survey link from CSHP and to encourage them to complete the survey.

Data Analysis

Data were analyzed for 151 respondents to the LHS and 233 respondents to the SHS (see Appendix II - Recognition List). Respondents who completed less than 10% of the questions were excluded from the analysis.

All authors of chapters in this report are members of the survey board. The authors were asked to submit to Leger Healthcare a list of the tables and figures required for their respective chapters. To create these elements, personnel with Leger first exported the data collected with the survey tool to statistical analysis software (IBM SPSS Statistics [version 30.0] and cross-tabulation software Q Professional [version 5.17.4.0]). Next, data tables were produced for each section to allow external validation of the data by the team. The data presentation took into account hospital teaching status (i.e., teaching, non-teaching or pediatric, based on CIHI information1); hospital bed size, based on the total number of beds (i.e., 50–200, 201–500 or > 500); and geographic region (i.e., British Columbia/Yukon [BC/YT], Alberta [AB], Manitoba/Saskatchewan, [MB/SK], Ontario [ON], Québec [QC] and the Atlantic [ATL] provinces [Nova Scotia, NS; New Brunswick, NB; Prince Edward Island, PE; Newfoundland and Labrador, NL]). Ultimately, there were no respondents from Yukon, so regional columns for this survey report are labelled “BC”, instead of “BC/YT”. Although all of the pediatric hospitals are teaching hospitals, their data are presented separately from the data designated as being from “teaching hospitals”; as such, the latter term refers specifically to adult teaching hospitals.

The authors reviewed all of the respondents’ comments in their respective sections of the survey to confirm the validity of the data shared. Many respondents were contacted by the managing editor to clarify, correct or confirm the data they entered on the survey if it appeared to be erroneous or an outlier. As a result of this review, some data were either eliminated or corrected. Only descriptive statistics were calculated (i.e., frequencies, percentages, means and standard deviations, medians, percentiles, minimums, maximums). Each variable was calculated using the applicable numeric base. Ratios were calculated wherever possible. When the number of respondents for a given variable was below 10, only the absolute data are presented, without percentages, to avoid potentially misleading comparisons.

Publication

Some chapters in the 2023/24 survey report have only one author, whereas others have two, reflecting the expertise and interest of survey board members in the various chapter topics. All chapter drafts were shared and discussed with the entire survey board to solicit comments and feedback and to ensure clarity of presentation.

All texts, tables and figures were proofread by the managing editor, Carolyn Dittmar, to ensure accuracy and compliance with editorial guidelines. In addition, all chapters of this report, including tables and figures, were copyedited (in English) by Peggy Robinson. The final survey report was translated from English to French by Leger Healthcare, and the translated documents were reviewed by a reviseur. The English and French versions of the report are available online here: https://cshp.ca/HPCSreports.

1. Hospital beds staffed and in operation, 2022-2023 [Excel spreadsheet]. Ottawa, ON: Canadian Institute for Health Information; 2024 [cited 2025 Jun 23]. Available from: https://www.cihi.ca/en/hospital-beds-staffed-and-in-operation-2022-2023

A - Demographics

Douglas Doucette

Of the 259 facilities that had 50 or more staffed acute care beds in fiscal year 2023/24, as listed by the Canadian Institute for Health Information (CIHI),[1] 151 responded to the 2023/24 CSHP Hospital Pharmacy in Canada Survey, for a response rate of 58%. This is a decrease from the response rate of 63% (144/228) for the 2020/21 survey.

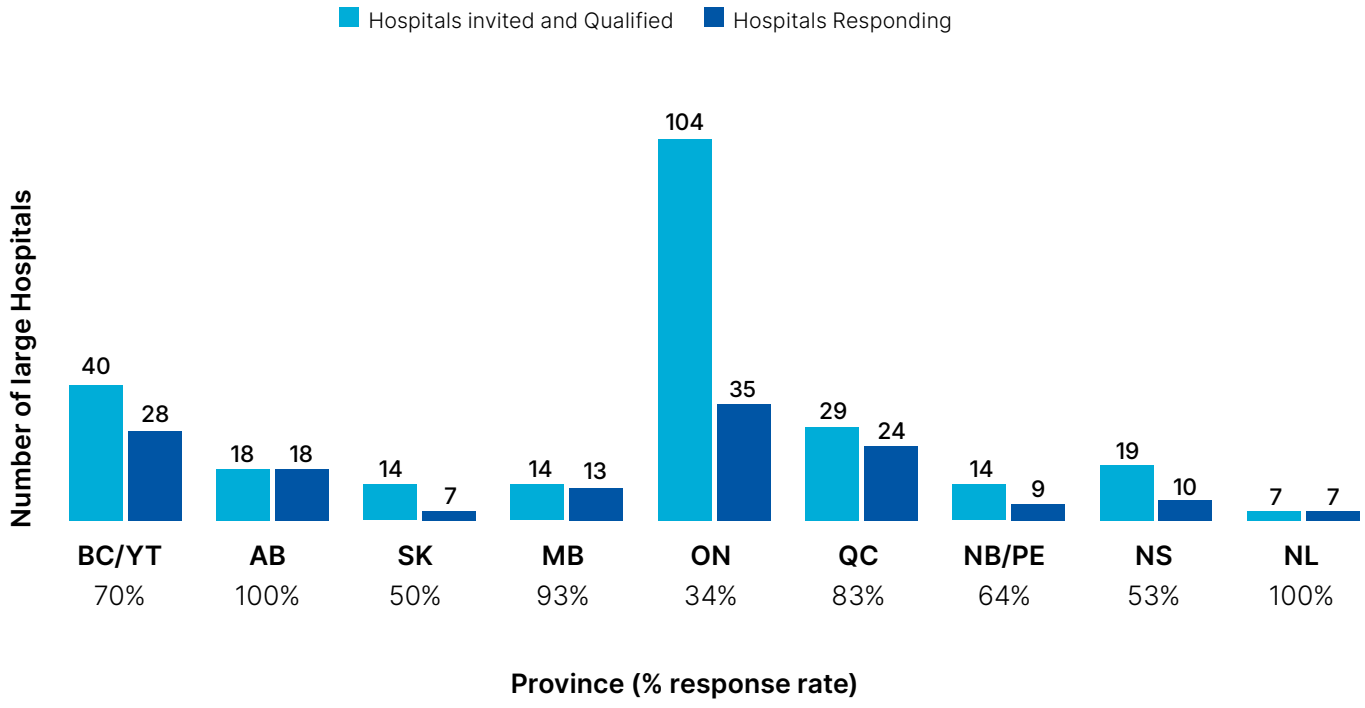
Response rates by province are shown in **Figure A-1**. Although Alberta (AB) did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, this province rejoined the survey in 2023/24, with a strong response rate of 100% (18/18).

Alberta rejoined the survey in 2023/24, with a response rate of 100%

- Compared to 2020/21, increases in response were seen for Quebec (QC), with 83% (24/29) in 2023/24 vs. 59% (36/61) in 2020/21; Manitoba (MB), with 93% (13/14) vs. 86% (12/14); Newfoundland and Labrador (NL), with 7 of 7 vs. 6 of 7; and Nova Scotia (NS), with 53% (10/19) vs. 31% (4/13). The decrease in the number of potential respondents in QC (from 61 in 2020/21 to 29 in 2023/24) is due to a greater number of respondents reporting for multiple facilities in that province.
- Decreases in response rates relative to 2020/21 were noted for New Brunswick (NB) and Prince Edward Island (PE) combined, with 64% (9/14) in 2023/24 vs. 82% (9/11) in 2020/21; Ontario (ON), with 34% (35/104) vs. 53% (39/73); and Saskatchewan (SK), with 50% (7/14) vs. 100% (11/11).
- For British Columbia (BC) and Yukon (YT) combined, the response rate was similar over the past two surveys: 70% (28/40) in 2023/24 vs. 71% (27/38) in 2020/21. Notably, however, there were no respondents from YT in either 2020/21 or 2023/24.

- For the first time in the history of the CSHP Hospital Pharmacy in Canada Survey, AB is being reported as its own region, like the larger provinces of BC, ON and QC. Up to the 2016/17 report, AB was included within the Prairie region, along with SK and MB. In the 2023/24 survey report, data from SK and MB are reported together in table and figures, labelled as "SK/MB". Readers should bear this change in mind when making comparisons with data for the Prairie region from past reports.
- As in past reports, the four eastern provinces (NB, NS, PE and NL) are reported as the Atlantic region or ATL.
- No facilities from any of the three territories (YT, Northwest Territories, Nunavut) responded to this iteration of the survey. In past survey reports, data for YT and BC were combined and reported as BC/YT (including for 2020/21, when there were no YT responses). However, for the 2023/24 report, in the absence of any YT responses, data for BC are labelled as "BC" (not BC/YT).
- NB/PE saw a small increase in eligible sites, from 11 in 2020/21 to 14 in 2023/24.
- Only 7 of 14 eligible sites in SK responded to the 2023/24 survey, whereas all 11 eligible sites responded to the 2020/21 survey.

Figure A-1 Response to the Survey by Province, 2023/24

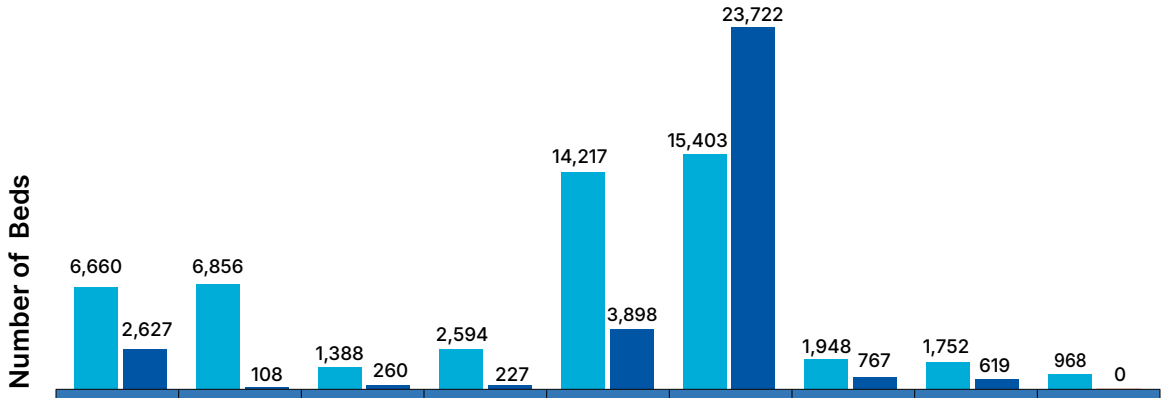


Note: Total number of respondents (including 6 pediatric hospitals) = 151 (58%, 151/259)

Although the response rate for this survey was slightly lower than the rate in 2020/21, the reported total number of acute care beds increased from 42,578 to 51,786. The total number of non-acute care beds reported also increased, from 28,153 in 2020/21 to 32,228 in 2023/24. **Figure A-2** shows the number of acute care and non-acute care beds by province in 2023/24.

- The total number of acute care beds reported by QC respondents increased from 14,078 to 15,403, accounting for 30% of acute care beds for all respondents in 2023/24. Furthermore, QC respondents reported a total of 39,125 beds (acute care and non-acute care combined), the largest number of any province or region in the 2023/24 survey. In addition, the 23,722 non-acute care beds reported by QC respondents account for 74% of the total non-acute care beds for all respondents in this survey.
- Similarly, although the number of responses from ON was lower for this survey (35 vs. 39 in 2020/21), the total reported number of acute care beds was higher (14,217 vs. 13,100, respectively).
- AB reported a total of 6,856 acute care beds, accounting for 13% of the beds in this category for all respondents.
- The 10 respondents from NS reported a total of 1,752 acute care beds, an increase from the 724 beds reported by 4 respondents in 2020/21.

Figure A-2 Respondents' Number of Acute Care and Non-acute Care Beds by Province, 2023/24



	BC	AB	SK	MB	ON	QC	NB/PE	NS	NL
Acute care beds	**6,660**	**6,856**	**1,388**	**2,594**	**14,217**	**15,403**	**1,948**	**1,752**	**968**
Non-acute care beds	**2,627**	**108**	**260**	**227**	**3,898**	**23,722**	**767**	**619**	**0**
Acute care beds % of province	72%	98%	84%	92%	78%	39%	72%	74%	100%
Non-acute care beds % of province	28%	2%	16%	8%	22%	61%	28%	26%	0%
Acute care beds % of total	13%	13%	3%	5%	27%	30%	4%	3%	2%
Non-acute care beds % of total	8%	0%	1%	1%	12%	74%	2%	3%	0%
TOTAL BEDS	**9,287**	**6,964**	**1,648**	**2,821**	**18,115**	**39,125**	**2,715**	**2,371**	**968**

Note: Data in this chart include beds in pediatric facilities

In some organizations, multiple hospital pharmacies operated under one pharmacy service, in accordance with a single set of policies and practices. As a result, rather than submitting a separate survey response for each facility, some respondents reported their multiple facilities as a combined entity. The option to respond this way was introduced in the 2016/17 survey to capture how pharmacy services are delivered, following changes in hospital governance in Canada. In these cases, total bed count accurately represents the combined number of beds for all facilities included in the survey response and, even though multiple facilities were reported as a single organization, the number of facilities included in a particular statistic is factored into the counts. **Table A-1** provides details on this combined reporting across the country.

- Overall, 35% (53/151) of respondents provided data for more than one facility, up from 29% (42/144) in 2020/21.
- This option was selected by 60% (30/50) of respondents from facilities with > 500 beds and to a lesser degree among respondents from facilities with 201-500 or 50-200 beds.
- Teaching hospital respondents were more likely than those from non-teaching facilities to report for multiple facilities: 44% (21/48) vs. 30% (29/97). Three of the six pediatric hospital respondents also reported for multiple facilities.
- By region, the proportion of respondents reporting data for more than one facility was far greater for QC (75%, 18/24) than for any other region of the country.

Table A-1 Respondents Reporting for More than One Facility, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(151)	(52)	(49)	(50)	(48)	(97)	(6)	(28)	(18)	(20)	(35)	(24)	(26)
Yes	(53)	(10)	(13)	(30)	(21)	(29)	(3)	(6)	(2)	(5)	(15)	(18)	(7)
	35%	**19%**	**27%**	**60%**	**44%**	**30%**	**0**	**21%**	**11%**	**25%**	**43%**	**75%**	**27%**
No	(98)	(42)	(36)	(20)	(27)	(68)	(3)	(22)	(16)	(15)	(20)	(6)	(19)
	65%	**81%**	**73%**	**40%**	**56%**	**70%**	**0**	**79%**	**89%**	**75%**	**57%**	**25%**	**73%**

Base: All respondents to this question, n = 151
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

A shift in reporting for single vs. multiple facilities may account for some of the decline in response rate, from 63% in 2020/21 to 58% in 2023/24. For example, ON saw fewer respondents and a lower response rate in the 2023/24 survey compared to the 2020/21 survey: 34% (35/104) vs. 53% (39/73), respectively. Of the 35 respondents from ON, 15 (43%) were reporting for more than one facility.

The average number of acute care beds per respondent was 343 **(Table A-2)**, an increase from the average of 296 in the past 3 surveys, dating back to 2013/14.

The average number of acute care beds per respondent increased by 16% over the past 3 surveys.

The average number of non-acute care beds per respondent was 336 (based on only those respondents who reported having non-acute care beds), an increase from 279 in 2020/21.

The average occupancy rate for acute care beds was 94% (n = 150), a notable increase from 81% in the 2020/21 survey (which reflected the early months of the COVID-19 pandemic) and up slightly from 91% in the 2016/17 survey. The average occupancy rate for non-acute care beds was 91%, up from 79% in the 2020/21 survey and 90% in the 2016/17 survey.

The average occupancy rates (for both acute and non-acute care beds) and the average length of stay **increased** relative to 2020/21 and 2016/17.

- The occupancy rate for acute care beds by bed size was 93% for the categories of 50-200 beds and > 500 beds and 96% for the category of 201-500 beds.
- For non-acute care beds, the average occupancy rates (for respondents with non-acute care beds who provided data for patient days) ranged from 86% for facilities with 50-200 beds to 95% for facilities with > 500 beds. Non-teaching hospitals had a higher average occupancy rate than teaching hospitals for non-acute care beds (96% vs. 88%, respectively).
- Regional differences in average occupancy rate of non-acute care beds were noted: 106% in BC, 99% in ON, 86% in SK/MB, 85% in AB, 80% in ATL and 78% in QC.

The average length of stay (ALOS) for acute care admissions was 7.6 days. This reflects an increase from 6.9 days in 2020/21 and is slightly higher than the stable ALOS of 7.1 or 7.2 observed in surveys dating back to 2001/02.

- In terms of bed size, ALOS was highest for facilities with > 500 beds, at 7.9 days.
- The ALOS for non-teaching hospitals was 7.9 days, higher than the 7.4 days for teaching hospitals.
- By region, SK/MB facilities had the highest ALOS, at 9.6 days, and ON the lowest, at 6.5 days. CIHI suggests that variations in hospital utilization and ALOS can be influenced by factors such as patient demographic characteristics, case complexity, and access to alternative care settings.[2]

Pediatric hospitals were represented by six respondents in this survey, compared to five in the 2020/21 survey.

- The total number of pediatric acute care beds was 1,249 compared to 1,375 in 2020/21.
- The average number of acute care beds per pediatric hospital respondent was 208, down from 275 in 2020/21, and the average occupancy rate of pediatric acute care beds was 64%, down slightly from 69% in 2020/21.
- The ALOS for pediatric acute care beds was 4.5 days, down from 5.2 days in 2020/21.

Table A-2 Hospital Demographic Data - Acute and Non-acute Care Beds, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Hospitals**	**(151)**	(52)	(49)	(50)	(48)	(97)	(6)	(28)	(18)	(20)	(35)	(24)	(26)
Totals													
Beds - acute care	**51,786**	**5,246**	**13,149**	**33,391**	**25,653**	**24,884**	**1,249**	**6,660**	**6,856**	**3,982**	**14,217**	**15,403**	**4,668**
Beds - non-acute care	**32,228**	**955**	**3,102**	**28,171**	**11,730**	**20,385**	**113**	**2,627**	**108**	**487**	**3,898**	**23,722**	**1,386**
Averages													
Beds – acute care	**343**	**101**	**268**	**668**	**534**	**256**	**208**	**238**	**381**	**199**	**406**	**642**	**180**
Beds - non-acute care*	**336**	**42**	**94**	**704**	**419**	**319**	**28**	**119**	**36**	**61**	**144**	**1186**	**87**
*The average for non-acute care beds was calculated for only those hospitals that reported having non-acute care beds, n = 96													
(n=) **Occupancy rate** (acute care)**	**(150)**	(52)	(49)	(49)	(48)	(96)	(6)	(28)	(18)	(20)	(34)	(24)	(26)
	94%	**93%**	**96%**	**93%**	**95%**	**95%**	**64%**	**99%**	**98%**	**86%**	**99%**	**84%**	**95%**
**Base: Respondents who provided patient days, n = 150													
(n=) **Occupancy rate** (non-acute care)***	**(92)**	(22)	(32)	(38)	(27)	(62)	(3)	(20)	(3)	(7)	(26)	(20)	(16)
	91%	**86%**	**90%**	**95%**	**88%**	**96%**	**26%**	**106%**	**85%**	**86%**	**99%**	**78%**	**80%**
***Base: Respondents with non-acute care beds who provided patient days, n = 92													
(n=) **Average length of stay** acute care (days)	**(150)**	(53)	(48)	(49)	(48)	(96)	(6)	(28)	(18)	(20)	(34)	(24)	(26)
	7.6	**7.4**	**7.5**	**7.9**	**7.4**	**7.9**	**4.5**	**6.9**	**7.5**	**9.6**	**6.5**	**8.7**	**7.3**

Base: n = 151 respondents

In the 2020/21 survey, new questions were added to gather information about emergency department (ED) visits and ambulatory clinic visits, and these questions remained in the 2023/24 survey.

- The average total annual number of ED visits for all sites was 74,956 (n = 140), approximately 50% greater than the 50,787 ED visits reported from the 2020/21 survey.

The average total annual number of ED visits increased by approximately 50% compared to the previous survey.

Table A-3 Average Annual Patient Visits to Emergency Department (ED), 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(140)	(52)	(49)	(50)	(48)	(97)	(6)	(28)	(18)	(20)	(35)	(24)	(26)
Average	**74,956**	**33,541**	**61,886**	**128,558**	**83,687**	**71,361**	**58,689**	**70,960**	**58,904**	**36,497**	**107,288**	**123,718**	**36,093**
Standard deviation (SD)	64,785	14,274	65,544	57,983	56,006	70,776	20,147	92,152	24,399	24,746	62,893	61,000	14,850

Base: All respondents who reported ED visits, n = 140

The average annual number of combined outpatient clinic visits was 175,423, approximately 15% higher than in 2020/21 (151,384) (Table A-4).

The average annual number of combined outpatient clinic visits was approximately 15% higher than in 2020/21.

- The average number of outpatient clinic visits was well above the national average for facilities with > 500 beds (but below the national average for smaller facilities) and for teaching hospitals These results may suggest that larger facilities and teaching hospitals are offering a more extensive range of clinical services.
- With the growth of ambulatory care and primary care services across the country, future surveys may identify trends in outpatient clinic services such as increasing numbers of visits to ambulatory clinics and primary care clinics.

Table A-4 Average Annual Patient Visits for All Ambulatory Clinics Combined, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(124)	(40)	(41)	(43)	(45)	(73)	(6)	(18)	(17)	(15)	(30)	(20)	(24)
Average	**175,423**	**39,950**	**141,170**	**334,103**	**264,011**	**120,193**	**182,977**	**73,973**	**48,554**	**61,988**	**302,589**	**340,629**	**115,644**
Standard deviation (SD)	205,908	43,280	119,541	253,798	237,742	171,142	92,727	69,676	66,526	123,553	232,597	261,108	96,669

Base: All respondents who reported ambulatory clinic visits, n = 124

1. Hospital beds staffed and in operation, 2022-2023 [Excel spreadsheet]. Ottawa, ON: Canadian Institute for Health Information; 2024 [cited June 2025]. Available from: https://www.cihi.ca/en/hospital-beds-staffed-and-in-operation-2022-2023

2. Hospital stays in Canada 2022–2023. Ottawa, ON: Canadian Institute for Health Information; 2024 Feb 22 [cited 2025 June 18]. Available from: https://www.cihi.ca/en/hospital-stays-in-canada-2022-2023

B - Clinical Pharmacy Practice

Megan Wisnowski

Clinical pharmacy practice in the hospital setting continues to evolve, reflecting consistent efforts to improve patient outcomes. Clinical pharmacy staff play a crucial role in shaping the patient's journey, with a direct impact on both quality of care and satisfaction. Research has shown that patients' satisfaction with their care is closely linked to the job satisfaction of healthcare providers.[1] When pharmacy professionals are actively involved in patient care, granted professional autonomy, integrated into a collaborative team and able to work to their full scope of practice, they report greater job fulfillment.[2]

A core focus for healthcare system pharmacy leaders is determining how best to allocate resources across clinical program areas while empowering staff to deliver services that most effectively impact patient outcomes. This chapter provides valuable insights into allocation of clinical pharmacist resources, clinical practice models, and involvement of pharmacists in specialized stewardship programs. It also examines how pharmacy clinical programs are evaluated and how medication-related outcomes are measured. Finally, the chapter highlights the extent to which patient satisfaction with pharmacy services is being assessed.

In terms of reporting regional data from the 2023/24 survey, the convention for the four eastern provinces (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and Newfoundland and Labrador [NL]) remains unchanged from prior reports, and these provinces are designated as the Atlantic region or ATL. Although Alberta (AB) did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, it rejoined the survey for 2023/24. However, unlike reports up to 2016/17, in which AB, Saskatchewan (SK) and Manitoba (MB) were combined as the Prairie region, AB is now treated as a region distinct from the SK/MB combination.

Patient Care Programs

Patient care programs are designed to serve specific groups of patients with similar care needs (e.g., critical care programs, mental health programs) (for definitions of certain terms, see Appendix IV – Definitions). Such programs can be intended for inpatients or outpatients, they are typically managed by a nurse or physician leader, and they may have clinical pharmacists assigned to them.

Transplant programs are among the least common inpatient programs yet among the most common programs with assignment of a pharmacist in teaching hospitals.

Table B-1 Profile of Pharmacist Assignment to Inpatient Programs, 2023/24

Inpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Cardiology	Program exists (n=)	(79)	(9)	(25)	(45)	(38)	(37)	(4)	(11)	(9)	(6)	(24)	(20)	(9)
	Pharmacist assigned	63 **80%**	3	23 **92%**	37 **82%**	36 **95%**	25 **68%**	2	10 **91%**	8	2	23 **96%**	13 **65%**	7
Chronic or complex continuing care	Program exists (n=)	(65)	(18)	(18)	(29)	(21)	(42)	(2)	(10)	(1)	(6)	(24)	(13)	(11)
	Pharmacist assigned	39 **60%**	8 **44%**	10 **56%**	21 **72%**	13 **62%**	25 **60%**	1	4 **40%**	0	3	20 **83%**	8 **62%**	4 **36%**
Clinical pharmacology and toxicology service	Program exists (n=)	(14)	(1)	(4)	(9)	(9)	(3)	(2)	(2)	(3)	(1)	(5)	(3)	(0)
	Pharmacist assigned	5 **36%**	0	3	2	2	2	1	2	0	0	2	1	0
Clinical research	Program exists (n=)	(58)	(5)	(21)	(32)	(33)	(21)	(4)	(10)	(4)	(4)	(19)	(14)	(7)
	Pharmacist assigned	33 **57%**	2	10 **48%**	21 **66%**	22 **67%**	8 **38%**	3	3 **30%**	3	2	9 **47%**	14 **100%**	2
Critical care (medical, surgical or cardiac)	Program exists (n=)	(135)	(40)	(45)	(50)	(48)	(82)	(5)	(26)	(16)	(11)	(33)	(24)	(25)
	Pharmacist Assigned	132 **98%**	38 **95%**	44 **98%**	50 **100%**	47 **98%**	80 **98%**	5	25 **96%**	16 **100%**	11 **100%**	33 **100%**	24 **100%**	23 **92%**
Diabetes/ endocrinology	Program exists (n=)	(56)	(6)	(20)	(30)	(30)	(22)	(4)	(9)	(7)	(3)	(15)	(16)	(6)
	Pharmacist assigned	9 **16%**	0	4 **20%**	5 **17%**	4 **13%**	4 **18%**	1	1	2	0	4 **27%**	2 **13%**	0

Table B-1 Profile of Pharmacist Assignment to Inpatient Programs, 2023/24 (Continued)

Inpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Gastroenterology	Program exists (n=)	(67)	(4)	(25)	(38)	(32)	(31)	(4)	(10)	(9)	(4)	(22)	(17)	(5)
	Pharmacist assigned	15 **22%**	0	5 **20%**	10 **26%**	6 **19%**	7 **23%**	2	1 **10%**	2	0	11 **50%**	1 **6%**	0
Genetics/rare disease care	Program exists (n=)	(13)	(3)	(3)	(7)	(7)	(2)	(4)	(1)	(2)	(1)	(5)	(4)	(0)
	Pharmacist assigned	1 **8%**	0	1	0	0	0	1	0	0	0	0	1	0
Geriatrics (inpatient acute care)	Program exists (n=)	(85)	(10)	(30)	(45)	(33)	(52)		(17)	(9)	(4)	(25)	(20)	(10)
	Pharmacist assigned	60 **71%**	6 **60%**	16 **53%**	38 **84%**	22 **67%**	38 **73%**		9 **53%**	4	4	21 **84%**	18 **90%**	4 **40%**
Hematology/ anticoagulation	Program exists (n=)	(56)	(5)	(23)	(28)	(33)	(18)	(5)	(5)	(10)	(5)	(16)	(14)	(6)
	Pharmacist assigned	29 **52%**	4	8 **35%**	17 **61%**	16 **48%**	9 **50%**	4	2	5 **50%**	2	8 **50%**	8 **57%**	4
HIV/AIDS	Program exists (n=)	(16)	(1)	(5)	(10)	(10)	(3)	(3)	(4)	(1)	(1)	(3)	(6)	(1)
	Pharmacist assigned	9 **56%**	1	3	5 **50%**	5 **50%**	2	2	3	0	0	2	3	1
Home hospital (virtual) care	Program exists (n=)	(25)	(3)	(5)	(17)	(15)	(10)		(5)	(5)	(1)	(3)	(9)	(2)
	Pharmacist assigned	16 **64%**	0	3	13 **76%**	12 **80%**	4 **40%**		5	4	0	0	7	0
Infectious diseases service	Program exists (n=)	(87)	(11)	(34)	(42)	(37)	(46)	(4)	(13)	(9)	(4)	(28)	(20)	(13)
	Pharmacist assigned	67 **77%**	8 **73%**	22 **65%**	37 **88%**	29 **78%**	35 **76%**	3	8 **62%**	8	2	23 **82%**	15 **75%**	11 **85%**
Long-term care	Program exists (n=)	(62)	(14)	(16)	(32)	(18)	(43)	(1)	(15)	(1)	(4)	(13)	(18)	(11)
	Pharmacist assigned	47 **76%**	5 **36%**	12 **75%**	30 **94%**	14 **78%**	32 **74%**	1	13 **87%**	1	1	11 **85%**	18 **100%**	3 **27%**
Medicine, family practice	Program exists (n=)	(127)	(47)	(38)	(42)	(44)	(80)	(3)	(21)	(18)	(20)	(27)	(16)	(25)
	Pharmacist assigned	116 **91%**	42 **89%**	34 **89%**	40 **95%**	42 **95%**	72 **90%**	2	20 **95%**	17 **94%**	20 **100%**	27 **100%**	13 **81%**	19 **76%**
Mental health	Program exists (n=)	(116)	(26)	(42)	(48)	(40)	(70)	(6)	(24)	(15)	(8)	(28)	(21)	(20)
	Pharmacist assigned	84 **72%**	13 **50%**	29 **69%**	42 **88%**	34 **85%**	45 **64%**	5	11 **46%**	14 **93%**	5	27 **96%**	15 **71%**	12 **60%**

Table B-1 Profile of Pharmacist Assignment to Inpatient Programs, 2023/24 (Continued)

Inpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Neurology	Program exists (n=)	(61)	(4)	(21)	(36)	(29)	(28)	(4)	(10)	(9)	(2)	(16)	(16)	(8)
	Pharmacist assigned	31 **51%**	0	12 **57%**	19 **53%**	18 **62%**	11 **39%**	2	5 **50%**	8	1	12 **75%**	3 **19%**	2
Obstetrics and/or gynecology and/or women's healthcare	Program exists (n=)	(120)	(37)	(38)	(45)	(39)	(78)	(3)	(23)	(15)	(13)	(29)	(20)	(20)
	Pharmacist assigned	48 **40%**	13 **35%**	18 **47%**	17 **38%**	16 **41%**	29 **37%**	3	7 **30%**	4 **27%**	3 **23%**	25 **86%**	3 **15%**	6 **30%**
Oncology	Program exists (n=)	(70)	(11)	(22)	(37)	(29)	(36)	(5)	(9)	(5)	(6)	(18)	(20)	(12)
	Pharmacist assigned	62 **89%**	9 **82%**	16 **73%**	37 **100%**	26 **90%**	31 **86%**	5	6	4	4	18 **100%**	20 **100%**	10 **83%**
Operating room, admitted patients	Program exists (n=)	(130)	(38)	(45)	(47)	(48)	(76)	(6)	(25)	(16)	(11)	(31)	(22)	(25)
	Pharmacist assigned	20 **15%**	5 **13%**	9 **20%**	6 **13%**	5 **10%**	14 **18%**	1	3 **12%**	2 **13%**	0 **0%**	10 **32%**	5 **23%**	0 **0%**
Pain service	Program exists (n=)	(66)	(10)	(26)	(30)	(30)	(32)	(4)	(11)	(7)	(5)	(21)	(8)	(14)
	Pharmacist assigned	7 **11%**	0 **0%**	4 **15%**	3 **10%**	3 **10%**	3 **9%**	1	1 **9%**	1	1	3 **14%**	1 **13%**	0 **0%**
Palliative care service	Program exists (n=)	(109)	(26)	(38)	(45)	(41)	(64)	(4)	(19)	(12)	(11)	(27)	(22)	(18)
	Pharmacist assigned	48 **44%**	9 **35%**	17 **45%**	22 **49%**	17 **41%**	29 **45%**	2	8 **42%**	7 **58%**	3 **27%**	17 **63%**	7 **32%**	6 **33%**
Pediatric intensive and/or neonatal intensive care	Program exists (n=)	(68)	(8)	(28)	(32)	(29)	(33)	(6)	(11)	(14)	(5)	(22)	(8)	(8)
	Pharmacist assigned	52 **76%**	5	21 **75%**	26 **81%**	23 **79%**	23 **70%**	6	7 **64%**	8 **57%**	5	21 **95%**	5	6
Pediatric and/or newborn care	Program exists (n=)	(104)	(29)	(33)	(42)	(34)	(64)	(6)	(21)	(10)	(10)	(27)	(18)	(18)
	Pharmacist assigned	55 **53%**	10 **34%**	20 **61%**	25 **60%**	18 **53%**	32 **50%**	5	9 **43%**	4 **40%**	4 **40%**	24 **89%**	6 **33%**	8 **44%**
Respirology	Program exists (n=)	(70)	(6)	(24)	(40)	(34)	(32)	(4)	(13)	(10)	(4)	(20)	(17)	(6)
	Pharmacist assigned	27 **39%**	0	8 **33%**	19 **48%**	17 **50%**	9 **28%**	1	2 **15%**	5 **50%**	0	15 **75%**	4 **24%**	1

Table B-1 Profile of Pharmacist Assignment to Inpatient Programs, 2023/24 (Continued)

Inpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Surgery, cardiac/ vascular	Program exists (n=)	(52)	(3)	(16)	(33)	(32)	(16)	(4)	(7)	(4)	(3)	(13)	(17)	(8)
	Pharmacist assigned	35 **67%**	2	12 **75%**	21 **64%**	25 **78%**	7 **44%**	3	6	4	3	10 **77%**	6 **35%**	6
Surgery, general	Program exists (n=)	(140)	(45)	(45)	(50)	(46)	(88)	(6)	(27)	(17)	(15)	(33)	(22)	(26)
	Pharmacist assigned	106 **76%**	24 **53%**	38 **84%**	44 **88%**	40 **87%**	63 **72%**	3	16 **59%**	14 **82%**	11 **73%**	30 **91%**	18 **82%**	17 **65%**
Surgery, neurology	Program exists (n=)	(36)	(2)	(8)	(26)	(25)	(6)	(5)	(6)	(4)	(2)	(8)	(11)	(5)
	Pharmacist assigned	18 **50%**	0	6	12 **46%**	13 **52%**	2	3	3	1	1	7	3 **27%**	3
Surgery, orthopedic	Program exists (n=)	(117)	(28)	(40)	(49)	(39)	(73)	(5)	(23)	(13)	(11)	(30)	(22)	(18)
	Pharmacist assigned	79 **68%**	14 **50%**	29 **73%**	36 **73%**	29 **74%**	47 **64%**	3	13 **57%**	10 **77%**	5 **45%**	27 **90%**	14 **64%**	10 **56%**
Rehabilitation	Program exists (n=)	(82)	(16)	(31)	(35)	(25)	(52)	(5)	(16)	(6)	(7)	(23)	(14)	(16)
	Pharmacist assigned	41 **50%**	4 **25%**	16 **52%**	21 **60%**	15 **60%**	23 **44%**	3	9 **56%**	0	3	21 **91%**	5 **36%**	3 **19%**
Transplantation, bone marrow	Program exists (n=)	(17)	(2)	(5)	(10)	(11)	(2)	(4)	(2)	(2)	(1)	(3)	(6)	(3)
	Pharmacist assigned	14 **82%**	1	3	10 **100%**	10 **91%**	1	3	1	2	1	2	6	2
Transplantation, solid organ	Program exists (n=)	(20)	(2)	(6)	(12)	(16)	(1)	(3)	(3)	(4)	(1)	(4)	(7)	(1)
	Pharmacist assigned	17 **85%**	0	5	12 **100%**	15 **94%**	0	2	2	3	1	4	6	1
Other inpatient patient care programs	Program exists (n=)	(29)	(5)	(7)	(17)	(17)	(11)	(1)	(6)	(5)	(1)	(5)	(6)	(6)
	Pharmacist assigned	22 **76%**	3	5	14 **82%**	14 **82%**	7 **64%**	1	5	5	1	4	5	2

Base: Respondents who answered question about inpatient care programs
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- Common programs across all bed sizes and hospital types included critical care, medicine/family practice, obstetrics/women's health, operating room and general surgery **(Table B-1)**. Hospitals of larger sizes were more likely to have cardiology, geriatrics, infectious disease, mental health and palliative care services.
- Clinical pharmacology and toxicology, genetics/rare diseases, HIV/AIDS and transplant programs were the least common.
- The SK/MB region had the smallest percentage of large hospitals with critical care units and mental health units.
- The most common inpatient programs to which pharmacists were assigned were critical care, medicine/family practice, oncology, transplant and cardiology.
- Larger hospitals were more likely than smaller hospitals to have pharmacists assigned to geriatric, infectious disease, mental health, pediatric critical care and general surgery units.
- Québec (QC) had the highest percentage (100%, 14/14) of facilities with clinical research units that had a pharmacist assigned.
- Ontario (ON) and QC had the most facilities with geriatric, chronic/complex care and long-term care (LTC) units with pharmacists assigned.
- Other inpatient care programs to which pharmacists were assigned included nephrology, stroke, rheumatology, antimicrobial stewardship and addictions.

Table B-2 Profile of Pharmacist Assignment to Outpatient Programs, 2023/24

Outpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Cardiology	Program exists (n=)	(83)	(9)	(29)	(45)	(41)	(37)	(5)	(8)	(14)	(4)	(23)	(23)	(11)
	Pharmacist assigned	34 **41%**	2	10 **34%**	22 **49%**	21 **51%**	12 **32%**	1	3	4 **29%**	1	9 **39%**	13 **57%**	4 **36%**
Clinical pharmacology and toxicology service	Program exists (n=)	(10)	(0)	(2)	(8)	(7)	(2)	(1)	(0)	(1)	(1)	(2)	(5)	(1)
	Pharmacist assigned	3 **30%**	0	1	2	2	0	1	0	0	0	1	2	0
Clinical research	Program exists (n=)	(53)	(3)	(17)	(33)	(30)	(19)	(4)	(4)	(3)	(4)	(18)	(19)	(5)
	Pharmacist assigned	37 **70%**	3	8 **47%**	26 **79%**	21 **70%**	12 **63%**	4	3	2	1	11 **61%**	17 **89%**	3

Table B-2 Profile of Pharmacist Assignment to Outpatient Programs, 2023/24 (Continued)

Outpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Diabetes/ endocrinology	Program exists (n=)	(76)	(11)	(29)	(36)	(33)	(38)	(5)	(10)	(9)	(3)	(25)	(20)	(9)
	Pharmacist assigned	11	2	2	7	4	5	2	0	1	1	7	2	0
		14%	**18%**	**7%**	**19%**	**12%**	**13%**		**0%**			**28%**	**10%**	
Emergency	Program exists (n=)	(126)	(43)	(33)	(50)	(45)	(75)	(6)	(17)	(16)	(16)	(32)	(23)	(22)
	Pharmacist assigned	98	26	28	44	39	54	5	8	15	13	26	21	15
		78%	**60%**	**85%**	**88%**	**87%**	**72%**		**47%**	**94%**	**81%**	**81%**	**91%**	**68%**
Gastroenterology	Program exists (n=)	(65)	(6)	(23)	(36)	(34)	(26)	(5)	(5)	(10)	(5)	(17)	(19)	(9)
	Pharmacist assigned	5	1	4	0	0	1	4	1	2	0	0	1	1
		8%		**17%**	**0%**	**0%**	**4%**			**20%**		**0%**	**5%**	
Genetics/rare disease care	Program exists (n=)	(22)	(3)	(7)	(12)	(12)	(5)	(5)	(2)	(3)	(1)	(7)	(7)	(2)
	Pharmacist assigned	3	1	1	1	1	0	2	0	2	0	0	1	0
		14%			**8%**	**8%**								
Hematology/ anticoagulation	Program exists (n=)	(64)	(5)	(20)	(39)	(32)	(27)	(5)	(4)	(8)	(5)	(18)	(22)	(7)
	Pharmacist assigned	35	5	9	21	20	11	4	2	7	3	9	8	6
		55%		**45%**	**54%**	**63%**	**41%**					**50%**	**36%**	
HIV/AIDS	Program exists (n=)	(36)	(3)	(12)	(21)	(20)	(12)	(4)	(6)	(2)	(2)	(9)	(10)	(7)
	Pharmacist assigned	25	3	10	12	15	6	4	6	2	2	5	4	6
		69%		**83%**	**57%**	**75%**	**50%**						**40%**	
Home care	Program exists (n=)	(66)	(18)	(22)	(26)	(22)	(41)	(3)	(9)	(9)	(6)	(11)	(18)	(13)
	Pharmacist assigned	10	2	5	3	2	7	1	3	3	1	0	1	2
		15%	**11%**	**23%**	**12%**	**9%**	**17%**					**0%**	**6%**	**15%**
Home hospital (virtual) care	Program exists (n=)	(31)	(8)	(7)	(16)	(14)	(16)	(1)	(4)	(2)	(1)	(9)	(9)	(6)
	Pharmacist assigned	9	0	0	9	6	3	0	2	1	0	0	6	0
		29%			**56%**	**43%**	**19%**							
Infectious diseases service	Program exists (n=)	(78)	(6)	(32)	(40)	(36)	(38)	(4)	(18)	(10)	(4)	(19)	(19)	(8)
	Pharmacist assigned	30	4	14	12	11	16	3	11	6	1	3	5	4
		38%		**44%**	**30%**	**31%**	**42%**		**61%**	**60%**		**16%**	**26%**	
Long-term care	Program exists (n=)	(19)	(2)	(3)	(14)	(8)	(11)	(0)	(4)	(0)	(1)	(5)	(7)	(2)
	Pharmacist assigned	11	1	2	8	5	6	0	3	0	1	2	5	0
		58%			**57%**		**55%**							

Table B-2 Profile of Pharmacist Assignment to Outpatient Programs, 2023/24 (Continued)

Outpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Medicine, family practice	Program exists (n=)	(60)	(8)	(19)	(33)	(35)	(25)	(0)	(6)	(8)	(4)	(18)	(16)	(8)
	Pharmacist assigned	22 **37%**	3	8 **42%**	11 **33%**	11 **31%**	11 **44%**	0	2	3	2	8 **44%**	6 **38%**	1
Mental health	Program exists (n=)	(91)	(20)	(28)	(43)	(40)	(45)	(6)	(13)	(10)	(6)	(28)	(17)	(17)
	Pharmacist assigned	25 **27%**	3 **15%**	7 **25%**	15 **35%**	12 **30%**	9 **20%**	4	4 **31%**	3 **30%**	1	7 **25%**	5 **29%**	5 **29%**
Nephrology/renal care/dialysis care	Program exists (n=)	(92)	(24)	(25)	(43)	(36)	(51)	(5)	(13)	(10)	(8)	(21)	(21)	(19)
	Pharmacist assigned	71 **77%**	15 **63%**	21 **84%**	35 **81%**	29 **81%**	37 **73%**	5	11 **85%**	7 **70%**	6	17 **81%**	15 **71%**	15 **79%**
Neurology	Program exists (n=)	(58)	(3)	(20)	(35)	(29)	(24)	(5)	(5)	(8)	(4)	(17)	(18)	(6)
	Pharmacist assigned	7 **12%**	2	3 **15%**	2 **6%**	4 **14%**	0 **0%**	3	0	4	0	1 **6%**	2 **11%**	0
Obstetrics and/or gynecology and/or women's healthcare	Program exists (n=)	(83)	(15)	(29)	(39)	(35)	(45)	(3)	(14)	(9)	(5)	(20)	(20)	(15)
	Pharmacist assigned	2 **2%**	0 **0%**	2 **7%**	0 **0%**	1 **3%**	0 **0%**	1	0 **0%**	0	0	1 **5%**	1 **5%**	0 **0%**
Oncology	Program exists (n=)	(108)	(35)	(33)	(40)	(31)	(71)	(6)	(20)	(8)	(11)	(24)	(23)	(22)
	Pharmacist assigned	98 **91%**	30 **86%**	29 **88%**	39 **98%**	26 **84%**	66 **93%**	6	18 **90%**	7	8 **73%**	22 **92%**	23 **100%**	20 **91%**
Operating room, day surgery	Program exists (n=)	(115)	(35)	(36)	(44)	(41)	(68)	(6)	(21)	(17)	(8)	(29)	(17)	(23)
	Pharmacist assigned	4 **3%**	1 **3%**	2 **6%**	1 **2%**	0 **0%**	3 **4%**	1	0 **0%**	0 **0%**	0	3 **10%**	1 **6%**	0 **0%**
Pain service	Program exists (n=)	(60)	(11)	(20)	(29)	(27)	(28)	(5)	(9)	(4)	(4)	(14)	(17)	(12)
	Pharmacist assigned	8 **13%**	1 **9%**	2 **10%**	5 **17%**	4 **15%**	1 **4%**	3	1	0	1	3 **21%**	3 **18%**	0 **0%**
Palliative care service	Program exists (n=)	(57)	(12)	(17)	(28)	(23)	(30)	(4)	(9)	(4)	(4)	(11)	(17)	(12)
	Pharmacist assigned	7 **12%**	4 **33%**	2 **12%**	1 **4%**	3 **14%**	2 **7%**	2	3	1	0	0 **0%**	2 **12%**	1 **8%**

Table B-2 Profile of Pharmacist Assignment to Outpatient Programs, 2023/24 (Continued)

Outpatient program		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pediatric and/or newborn care	Program exists (n=)	(68)	(11)	(23)	(34)	(27)	(36)	(5)	(9)	(6)	(4)	(22)	(17)	(10)
	Pharmacist assigned	6 **9%**	0 **0%**	2 **9%**	4 **12%**	3 **11%**	2 **6%**	1	1	1	0	2 **9%**	2 **12%**	0 **0%**
Respirology	Program exists (n=)	(71)	(11)	(25)	(35)	(34)	(32)	(5)	(11)	(10)	(5)	(15)	(19)	(11)
	Pharmacist assigned	10 **14%**	2 **18%**	4 **16%**	4 **11%**	5 **15%**	1 **3%**	4	4 **36%**	1 **10%**	0	2 **13%**	3 **16%**	0 **0%**
Surgery, pre-admission	Program exists (n=)	(118)	(32)	(41)	(45)	(44)	(68)	(6)	(19)	(14)	(9)	(31)	(22)	(23)
	Pharmacist assigned	21 **18%**	2 **6%**	8 **20%**	11 **24%**	11 **25%**	9 **13%**	1	3 **16%**	1 **7%**	1	11 **35%**	4 **18%**	1 **4%**
Rehabilitation	Program exists (n=)	(66)	(16)	(25)	(25)	(24)	(36)	(6)	(9)	(13)	(4)	(15)	(12)	(13)
	Pharmacist assigned	4 **6%**	0 **0%**	1 **4%**	3 **12%**	1 **4%**	2 **6%**	1	0	0 **0%**	0	2 **13%**	2 **17%**	0 **0%**
Transplantation, bone marrow	Program exists (n=)	(16)	(2)	(4)	(10)	(10)	(2)	(4)	(1)	(1)	(1)	(3)	(7)	(3)
	Pharmacist assigned	10 **63%**	2	2	6 **60%**	6 **60%**	1	3	0	1	0	2	5	2
Transplantation, solid organ	Program exists (n=)	(25)	(2)	(7)	(16)	(20)	(2)	(3)	(3)	(4)	(2)	(4)	(8)	(4)
	Pharmacist assigned	16 **64%**	1	4	11 **69%**	13 **65%**	0	3	2	3	2	2	5	2
Other outpatient patient care programs	Program exists (n=)	(29)	(7)	(8)	(14)	(16)	(13)	(0)	(4)	(6)	(5)	(7)	(3)	(4)
	Pharmacist assigned	14 **48%**	2	3	9 **64%**	10 **63%**	4 **31%**	0	1	5	0	4	2	2

Base: Respondents who answered question about outpatient care programs
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- A wide range of outpatient programs are available across Canada, with a high degree of variation in the types of services offered from one province to another **(Table B-2)**. Emergency Department (ED) care is the most commonly provided outpatient service, with 85% (126/148) of respondents reporting ED care at their facility.
- QC facilities reported the most outpatient programs, with an average of 19 per facility.
- Oncology, nephrology/renal/dialysis care and emergency outpatient programs were the programs that most commonly had assignment of pharmacists.
- Pediatric facilities had the highest number of outpatient programs with a pharmacist assigned, an average of 11.5 per facility.
- In comparison to the 2020/21 survey, emergency outpatient programs have seen the greatest growth in pharmacist assignment. In fiscal year 2020/21, 38% (46/120) of respondents reported assignment of a pharmacist to the ED. In fiscal year 2023/24, 78% (98/126) of respondents reported assignment of a pharmacist to the ED. Although Alberta (AB) did not participate in the 2020/21 survey, that province contributed 15 of the 98 respondents with pharmacists in the ED in the 2023/24 survey.
- Additional outpatient programs to which pharmacists were more commonly assigned included home parenteral therapy and geriatrics.

Every province saw a considerable increase in pharmacist assgnment to emergency outpatient programs relative to the previous report.

Profile of Clinical Pharmacy Activities

In providing clinical services to hospitalized patients, pharmacists aim to optimize the patient's experience by improving the safety and effectiveness of medication therapy. Clinical pharmacy services can be provided at a system level (e.g., reviewing order sets) or can be provided directly to patients. The clinical pharmacy key performance indicators (cpKPIs) define service activities that directly influence patient outcomes.[3] They are meant to advance the quality of care that patients receive and describe a standard for clinical practice that can be benchmarked.[4] Studies have shown that pharmacy staff who spend more time on these activities experience higher levels of job satisfaction.[1]

Table B-3 Profile of Clinical Pharmacy Activities, 2023/24

Clinical Pharmacy Activities	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Pharmacists are involved in identifying, developing, reviewing or approving new medication order sets**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	65	20	22	23	24	36	5	6	4	5	23	13	14
	44%	**38%**	**47%**	**47%**	**51%**	**38%**		**21%**	**24%**	**25%**	**70%**	**54%**	**54%**
Exists in most areas/ situations (50%–99%)	52	19	13	20	15	37	0	11	5	12	9	9	6
	35%	**37%**	**28%**	**41%**	**32%**	**39%**		**39%**	**29%**	**60%**	**27%**	**38%**	**23%**
Exists only in some areas/situations (1%–49%)	27	10	11	6	8	18	1	9	6	3	1	2	6
	18%	19%	23%	12%	17%	19%		33%	35%	15%	3%	8%	23%
Does not exist (0%)	4	3	1	0	0	4	0	2	2	0	0	0	0
	3%	6%	2%	0%	0%	4%		7%	12%	0%	0%	0%	0%
(n=) **Pharmacists are involved in monitoring and reporting potential and actual adverse drug events (ADEs)**	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	28	8	9	11	11	14	3	3	3	2	16	2	2
	19%	**15%**	**19%**	**22%**	**23%**	**15%**		**11%**	**17%**	**10%**	**49%**	**8%**	**8%**
Exists in most areas/ situations (50%–99%)	78	29	23	26	26	50	2	16	14	12	12	13	11
	52%	**56%**	**49%**	**52%**	**54%**	**53%**		**57%**	**78%**	**60%**	**36%**	**54%**	**42%**
Exists only in some areas/situations (1%–49%)	43	15	15	13	11	31	1	9	1	6	5	9	13
	29%	29%	32%	26%	23%	32%		32%	5%	30%	15%	38%	50%
Does not exist (0%)	0	0	0	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(n=) **Pharmacists facilitate medication-related continuity of care when patients experience transitions of care (excluding discharge)**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	13	3	2	8	4	8	1	0	1	0	7	4	1
	9%	**6%**	**4%**	**16%**	**9%**	**8%**		**0%**	**5%**	**0%**	**21%**	**17%**	**4%**
Exists in most areas/ situations (50%–99%)	71	24	21	26	27	41	3	8	12	10	21	11	9
	48%	**46%**	**45%**	**53%**	**57%**	**43%**		**29%**	**71%**	**50%**	**64%**	**46%**	**35%**
Exists only in some areas/situations (1%–49%)	59	22	22	15	16	41	2	18	4	9	5	9	14
	40%	42%	47%	31%	34%	43%		64%	24%	45%	15%	37%	54%
Does not exist (0%)	5	3	2	0	0	5	0	2	0	1	0	0	2
	3%	6%	4%	0%	0%	6%		7%	0%	5%	0%	0%	7%

Table B-3 Profile of Clinical Pharmacy Activities, 2023/24 (Continued)

Clinical Pharmacy Activities	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Pharmacists ensure medication-related continuity of care for discharged patients**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	3	1	1	1	1	1	1	0	0	0	1	1	1
	2%	**2%**	**2%**	**2%**	**2%**	**1%**		**0%**	**0%**	**0%**	**3%**	**4%**	**4%**
Exists in most areas/ situations (50%–99%)	46	13	14	19	24	19	3	6	11	5	11	7	6
	31%	**25%**	**30%**	**39%**	**51%**	**20%**		**22%**	**65%**	**25%**	**33%**	**29%**	**23%**
Exists only in some areas/situations (1%-49%)	89	31	30	28	22	65	2	18	6	14	20	15	16
	60%	60%	64%	57%	47%	68%		64%	35%	70%	61%	63%	61%
Does not exist (0%)	10	7	2	1	0	10	0	4	0	1	1	1	3
	7%	13%	4%	2%	0%	11%		14%	0%	5%	3%	4%	12%
(n=) **Pharmacists are involved in developing patient care plans**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	9	2	2	5	5	3	1	0	1	1	2	4	1
	6%	**4%**	**4%**	**10%**	**11%**	**4%**		**0%**	**6%**	**5%**	**6%**	**16%**	**4%**
Exists in most areas/ situations (50%–99%)	79	18	31	30	29	46	4	16	14	8	25	10	6
	53%	**35%**	**66%**	**61%**	**62%**	**48%**		**57%**	**82%**	**40%**	**76%**	**42%**	**23%**
Exists only in some areas/situations (1%-49%)	52	25	13	14	13	38	1	11	2	7	6	10	16
	36%	48%	28%	29%	27%	40%		39%	12%	35%	18%	42%	62%
Does not exist (0%)	8	7	1	0	0	8	0	1	0	4	0	0	3
	5%	13%	2%	0%	0%	8%		4%	0%	2%	0%	0%	11%
(n=) **Pharmacists review medication orders before the first dose is administered**	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	6	3	1	2	2	3	1	0	0	1	3	2	0
	4%	**6%**	**2%**	**4%**	**4%**	**3%**		**0%**	**0%**	**5%**	**9%**	**8%**	**0%**
Exists in most areas/ situations (50%–99%)	115	36	37	42	39	72	4	22	18	10	26	20	19
	77%	**69%**	**79%**	**84%**	**81%**	**76%**		**79%**	**100%**	**50%**	**79%**	**84%**	**73%**
Exists only in some areas/situations (1%–49%)	24	10	9	5	6	17	1	6	0	6	4	1	7
	16%	19%	19%	10%	13%	18%		21%	0%	30%	12%	4%	27%
Does not exist (0%)	4	3	0	1	1	3	0	0	0	3	0	1	0
	3%	6%	0%	2%	2%	3%		0%	0%	15%	0%	4%	0%

Table B-3 Profile of Clinical Pharmacy Activities, 2023/24 (Continued)

Clinical Pharmacy Activities	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Patients' medication profiles are reviewed for appropriateness**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	35	13	8	14	8	25	2	1	1	6	11	8	8
	24%	**25%**	**17%**	**29%**	**17%**	**26%**		**4%**	**6%**	**30%**	**33%**	**33%**	**31%**
Exists in most areas/ situations (50%–99%)	100	32	37	31	35	61	4	25	14	10	22	14	15
	68%	**62%**	**79%**	**63%**	**74%**	**64%**		**89%**	**82%**	**50%**	**67%**	**59%**	**58%**
Exists only in some areas/situations (1%–49%)	12	7	2	3	3	9	0	2	2	4	0	1	3
	7%	13%	4%	6%	7%	10%		7%	12%	20%	0%	4%	11%
Does not exist (0%)	1	0	0	1	1	0	0	0	0	0	0	1	0
	1%	0%	0%	2%	2%	0%		0%	0%	0%	0%	4%	0%
(n=) **Pharmacists have a role in adjusting the dosage or changing the therapy for select medications when a patient's genetic characteristics are kn own**	(148)	(51)	(47)	(50)	(48)	(94)	(6)	(28)	(18)	(19)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	13	8	2	3	3	9	1	0	0	1	4	4	4
	9%	**16%**	**4%**	**6%**	**6%**	**10%**		**0%**	**0%**	**5%**	**12%**	**17%**	**15%**
Exists in most areas/ situations (50%–99%)	28	6	12	10	10	16	2	6	5	2	8	5	2
	19%	**12%**	**26%**	**20%**	**21%**	**17%**		**21%**	**28%**	**11%**	**24%**	**21%**	**8%**
Exists only in some areas/situations (1%–49%)	46	15	13	18	17	28	1	9	8	4	11	10	4
	31%	29%	28%	36%	35%	30%		32%	44%	21%	33%	42%	15%
Does not exist (0%)	61	22	20	19	18	41	2	13	5	12	10	5	16
	41%	43%	42%	38%	38%	43%		47%	28%	63%	31%	20%	62%
(n=) **Pharmacists participate on your facility's rapid response teams and/ or cardiopulmonary resuscitation teams (e.g., Code Blue teams)**	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	4	1	2	1	1	2	1	0	1	0	0	2	1
	3%	**2%**	**4%**	**2%**	**2%**	**2%**		**0%**	**6%**	**0%**	**0%**	**8%**	**4%**
Exists in most areas/ situations (50%–99%)	7	2	1	4	1	5	1	1	0	0	3	3	0
	5%	**4%**	**2%**	**8%**	**2%**	**5%**		**4%**	**0%**	**0%**	**9%**	**13%**	**0%**
Exists only in some areas/situations (1%–49%)	37	7	13	17	13	23	1	14	3	2	2	14	2
	25%	13%	28%	34%	27%	24%		50%	17%	10%	6%	58%	8%
Does not exist (0%)	101	42	31	28	33	65	3	13	14	18	28	5	23
	67%	81%	66%	56%	69%	69%		46%	77%	90%	85%	21%	88%

Table B-3 Profile of Clinical Pharmacy Activities, 2023/24 (Continued)

Clinical Pharmacy Activities	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Pharmacists independently write medication orders (e.g., adjust the dosages of medications on the basis of patient's response or pharmacokinetic characteristics)**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	22 **15%**	6 **12%**	8 **17%**	8 **16%**	12 **26%**	9 **9%**	1	4 **14%**	1 **6%**	2 **10%**	7 **21%**	4 **17%**	4 **15%**
Exists in most areas/ situations (50%–99%)	58 **39%**	17 **33%**	22 **47%**	19 **39%**	16 **34%**	39 **41%**	3	15 **54%**	11 **65%**	1 **5%**	9 **27%**	9 **38%**	13 **50%**
Exists only in some areas/situations (1%-49%)	51 34%	17 33%	13 28%	21 43%	17 36%	33 35%	1	6 21%	5 29%	9 45%	11 33%	11 45%	9 35%
Does not exist (0%)	17 12%	12 22%	4 8%	1 2%	2 4%	14 15%	1	3 11%	0 0%	8 40%	6 19%	0 0%	0 0%
(n=) **Pharmacists provide discharge education to patients in your facility**	(147)	(51)	(47)	(49)	(47)	(94)	(6)	(28)	(17)	(19)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	3 **2%**	1 **2%**	1 **2%**	1 **2%**	1 **2%**	1 **1%**	1	0 **0%**	0 **0%**	0 **0%**	1 **3%**	1 **4%**	1 **4%**
Exists in most areas/ situations (50%–99%)	35 **24%**	8 **16%**	12 **26%**	15 **31%**	16 **34%**	17 **18%**	2	7 **25%**	10 **59%**	6 **32%**	5 **15%**	4 **17%**	3 **12%**
Exists only in some areas/situations (1%–49%)	95 65%	34 67%	32 68%	29 59%	26 55%	66 70%	3	19 68%	7 41%	8 42%	25 76%	15 63%	21 81%
Does not exist (0%)	14 9%	8 15%	2 4%	4 8%	4 9%	10 11%		2 7%	0 0%	5 26%	2 6%	4 16%	1 3%
(n=) **Pharmacists routinely document recommendations**	(148)	(51)	(47)	(50)	(48)	(94)	(6)	(28)	(18)	(19)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	29 **20%**	11 **22%**	8 **17%**	10 **20%**	10 **21%**	17 **18%**	2	2 **7%**	5 **28%**	3 **16%**	9 **27%**	3 **13%**	7 **27%**
Exists in most areas/ situations (50%–99%)	88 **59%**	29 **57%**	23 **49%**	36 **72%**	30 **63%**	54 **57%**	4	18 **64%**	12 **67%**	6 **32%**	21 **64%**	18 **75%**	13 **50%**
Exists only in some areas/situations (1%-49%)	31 21%	11 21%	16 34%	4 8%	8 16%	23 25%	0	8 29%	1 5%	10 52%	3 9%	3 12%	6 23%
Does not exist (0%)	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%

Table B-3 Profile of Clinical Pharmacy Activities, 2023/24 (Continued)

Clinical Pharmacy Activities	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=) **Pharmacists monitor progress and achievement of therapeutic goals**	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(17)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	15	4	3	8	6	8	1	1	2	2	7	2	1
	10%	**8%**	**6%**	**16%**	**13%**	**8%**		**4%**	**12%**	**10%**	**21%**	**8%**	**4%**
Exists in most areas/ situations (50%–99%)	75	23	25	27	26	45	4	13	11	7	20	13	11
	51%	**44%**	**53%**	**55%**	**55%**	**47%**		**46%**	**65%**	**35%**	**61%**	**54%**	**42%**
Exists only in some areas/situations (1%–49%)	54	21	19	14	15	38	1	14	4	8	6	9	13
	36%	40%	40%	29%	32%	40%		50%	24%	40%	18%	38%	50%
Does not exist (0%)	4	4	0	0	0	4	0	0	0	3	0	0	1
	3%	8%	0%	0%	0%	5%		0%	0%	15%	0%	0%	4%
(n=) **Pharmacists work to their full scope of practice as defined by legislation in your province or territory**	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Exists in all areas/ situations (100%)	26	10	7	9	8	16	2	3	5	1	8	3	6
	18%	**19%**	**15%**	**18%**	**17%**	**17%**		**11%**	**28%**	**5%**	**24%**	**13%**	**23%**
Exists in most areas/ situations (50%–99%)	72	26	22	24	26	43	3	13	12	7	14	11	15
	48%	**50%**	**47%**	**48%**	**54%**	**45%**		**46%**	**67%**	**35%**	**42%**	**46%**	**58%**
Exists only in some areas/situations (1%–49%)	46	16	14	16	11	34	1	11	1	11	9	9	5
	31%	31%	30%	32%	23%	36%		39%	5%	55%	27%	38%	19%
Does not exist (0%)	5	0	4	1	3	2	0	1	0	1	2	1	0
	3%	0%	8%	2%	6%	2%		4%	0%	5%	7%	3%	0%

Base: Respondents who answered question about clinical pharmacy activities, n = 149
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- For most activities **(Table B-3)**, the degree to which respondents reported clinical pharmacy activities in their facilities did not change substantially compared to 2020/21.
- A change in wording between the 2020/21 and 2023/24 surveys may have influenced the decrease in the percentage of respondents who indicated that medication-related continuity of care for discharged patients occurred in most or all areas. In 2020/21 the question was broad inquiring if the facility had processes to ensure medication-related continuity of care for discharged patients. In 2023/24 the question was specific to a pharmacist's involvement. The percentage of respondents who indicated that medication-related continuity of care for discharged patients occurred in most or all areas

decreased from 52% (75/143) in 2020/21 to 33% (49/148) in 2023/24. However, there was an increase in respondents who reported that pharmacists provide discharge education in most or all areas: from 17% (25/143) in 2020/21 to 26% (38/147) in 2023/24.

- There was an increase in the percentage of respondents who indicated that pharmacists have a role in adjusting the dose of therapy when a patient's genetic characteristics are known: from 13% (19/143) in 2020/21 to 28% (41/148) in 2023/24.

Table B-4 Extent of Implementation and Intention to Collect Clinical Pharmacy Key Performance Indicators (cpKPIs), 2023/24

cpKPI	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Medication reconciliation on admission: Proportion of patients who received documented medication reconciliation on admission (as well as resolution of identified discrepancies) performed by a pharmacist	89	28	27	34	29	56	4	20	2	7	25	20	15
	60%	**54%**	**57%**	**69%**	**60%**	**60%**		**71%**	**11%**	**35%**	**78%**	**83%**	**58%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	110	36	30	44	41	65	4	16	18	10	25	23	18
	74%	**69%**	**64%**	**90%**	**85%**	**69%**		**57%**	**100%**	**50%**	**78%**	**96%**	**69%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Pharmaceutical care plan: Proportion of patients for whom pharmacists have developed and initiated a pharmaceutical care plan	59	20	19	20	19	37	3	18	0	5	9	14	13
	40%	**38%**	**40%**	**41%**	**40%**	**39%**		**64%**	**0%**	**25%**	**28%**	**58%**	**50%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	71	24	22	25	31	37	3	11	18	3	16	8	15
	48%	**46%**	**47%**	**51%**	**65%**	**39%**		**39%**	**100%**	**15%**	**50%**	**33%**	**58%**
(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(28)	(18)	(20)	(32)	(23)	(26)
Resolved drug therapy problems: Number of drug therapy problems resolved by a pharmacist per admission	60	21	18	21	20	37	3	17	0	7	11	12	13
	41%	**40%**	**38%**	**44%**	**42%**	**40%**		**61%**	**0%**	**35%**	**34%**	**52%**	**50%**
(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(28)	(18)	(20)	(31)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	73	27	22	24	29	40	4	11	18	8	15	6	15
	50%	**52%**	**47%**	**50%**	**60%**	**43%**		**39%**	**100%**	**40%**	**48%**	**25%**	**58%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Interprofessional patient care rounds: Proportion of patients for whom a pharmacist participated in interprofessional patient care rounds to improve medication management	59	20	20	19	20	36	3	17	0	5	12	12	13
	40%	**38%**	**43%**	**39%**	**42%**	**38%**		**61%**	**0%**	**25%**	**38%**	**50%**	**50%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	70	28	24	18	28	38	4	11	18	7	15	3	16
	47%	**54%**	**51%**	**37%**	**58%**	**40%**		**39%**	**100%**	**35%**	**47%**	**13%**	**62%**

Table B-4 Extent of Implementation and Intention to Collect Clinical Pharmacy Key Performance Indicators (cpKPIs), 2023/24 (Continued)

cpKPI	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Patient education during hospital stay: Proportion of patients who received education from a pharmacist about their disease(s) and medication(s) during their hospital stay	58	19	20	19	19	35	4	17	2	5	10	12	12
	39%	**37%**	**43%**	**39%**	**40%**	**37%**		**61%**	**11%**	**25%**	**31%**	**50%**	**46%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	68	27	22	19	27	38	3	10	18	8	14	3	15
	46%	**52%**	**47%**	**39%**	**56%**	**40%**		**36%**	**100%**	**40%**	**44%**	**13%**	**58%**
(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(28)	(18)	(20)	(31)	(24)	(26)
Patient education at discharge: Proportion of patients who received medication education from a pharmacist at discharge	57	18	20	19	18	36	3	17	2	4	10	12	12
	39%	**35%**	**43%**	**40%**	**38%**	**39%**		**61%**	**11%**	**20%**	**32%**	**50%**	**46%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	69	27	23	19	25	41	3	11	18	7	16	2	15
	47%	**52%**	**49%**	**39%**	**52%**	**44%**		**39%**	**100%**	**35%**	**50%**	**8%**	**58%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Medication reconciliation at discharge: Proportion of patients who received documented medication reconciliation at discharge (as well as resolution of identified discrepancies), performed by a pharmacist	65	18	22	25	22	40	3	17	2	4	17	13	12
	44%	**35%**	**47%**	**51%**	**46%**	**43%**		**61%**	**11%**	**20%**	**53%**	**54%**	**46%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year	88	25	27	36	36	50	2	11	18	5	22	17	15
	59%	**48%**	**57%**	**73%**	**75%**	**53%**		**39%**	**100%**	**25%**	**69%**	**71%**	**58%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Comprehensive direct patient care bundle: Proportion of patients who received comprehensive direct patient care from a pharmacist working in collaboration with the healthcare team (n=)	49	15	19	15	16	31	2	15	0	3	8	12	11
	33%	**29%**	**40%**	**31%**	**33%**	**33%**		**54%**	**0%**	**15%**	**25%**	**50%**	**42%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Plans to collect data for this cpKPI in the 2024/25 fiscal year (n=)	64	20	23	21	27	34	3	8	18	4	9	10	15
	43%	**38%**	**49%**	**43%**	**56%**	**36%**		**29%**	**100%**	**20%**	**28%**	**42%**	**58%**

Base: Respondents with data collection. Base respondents, n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- Medication reconciliation on admission was the cpKPI with the highest extent of implementation and highest level of data collection **(Table B-4)**.
- Relative to the 2020/21 survey, there were small increases in the extent of cpKPI implementation, except for medication reconciliation on admission and discharge, both of which saw small decreases **(Table B-5)**. These decreases may have been attributable to the shared responsibility of medication reconciliation among

healthcare providers. Education is also a shared responsibility among healthcare providers. However, education can be provided multiple times by multiple healthcare providers, whereas medication reconciliation is typically completed only once on admission and once at discharge. Perhaps the decreases in medication reconciliation by pharmacists can be explained by increases in medication reconciliation completed by physicians instead.

Table B-5 Trends in Implementation of Clinical Pharmacy Key Performance Indicators (cpKPIs), 2023/24 vs. 2020/21

cpKPI	2023/24	2020/21
Medication reconciliation on admission	89/148	93/143
	60%	**65%**
Pharmaceutical care plan	59/148	35/143
	40%	**24%**
Resolved drug therapy problems	60/147	52/143
	41%	**36%**
Interprofessional care rounds	59/148	41/143
	40%	**29%**
Patient education during hospital stay	58/148	42/143
	39%	**29%**
Patient education at discharge	57/147	40/143
	39%	**28%**
Medication reconciliation at discharge	65/148	67/143
	44%	**47%**
Comprehensive direct patient care bundle	49/148	26/143
	33%	**18%**

Canada is not progressing in efforts to collect cpKPI data. Many respondents report awaiting implementation of electronic health records to begin data collection.

- British Columbia (BC) reported the highest extent of cpKPI implementation across the nation, whereas AB reported the lowest extent of cpKPI implementation.
- A high percentage of respondents indicated that data for cpKPIs were not collected in fiscal year 2023/24, with AB followed by SK/MB having the highest percentage of facilities not collecting cpKPI data. There are many barriers to collecting cpKPI data, including documentation challenges, increased workload, constraints in the practice environment and competing priorities.[5] AB facilities reported plans to collect data on all cpKPIs in the 2024/25 fiscal year following implementation of a standardized provincial workload documentation tool.
- Only 29% (43/147) of respondents reported collecting additional performance indicators. The most common additional indicators were the quantity of interventions performed, the use of prescriptive authority, and the time associated with each intervention. Some respondents collected data on specific interventions, including deprescribing, thromboprophylaxis assessments and antimicrobial stewardship.

Pharmacy Practice Models

The Canadian Society of Healthcare-Systems Pharmacy (CSHP) has consistently focused on the patient experience and keeping the patient at the centre of care.[6] This focus has shifted the pharmacist's role from traditional medication distribution to establishing partnerships with care teams, providing comprehensive clinical services and offering stewardship of medication-use systems.[6] Evaluating services, understanding the connection of activities to patient outcomes and determining the impact on the patient experience are key steps in the evolution of pharmacy practice models.

Table B-6 Profile of Pharmacy Practice Model and Stewardship Program Involvement, 2023/24

Pharmacy Practice Model	All	Bed Size (A1)			Hospital Type			Region					
		50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n =)	(147)	(51)	(47)	(49)	(48)	(93)	(6)	(28)	(17)	(20)	(32)	(24)	(26)
Mostly direct patient care activities with limited distributive activities	87	22	30	35	38	45	4	11	15	7	24	16	14
	59%	**43%**	**64%**	**71%**	**79%**	**48%**		**39%**	**88%**	**35%**	**75%**	**67%**	**54%**
Similar amounts of distributive and direct patient care activities	46	23	12	11	10	34	2	13	1	12	6	4	10
	31%	**45%**	**26%**	**23%**	**21%**	**37%**		**46%**	**6%**	**60%**	**19%**	**17%**	**38%**
Mostly distributive activities with limited direct patient care activities	11	4	4	3	0	11	0	3	0	1	1	4	2
	7%	**8%**	**8%**	**6%**	**0%**	**12%**		**11%**	**0%**	**5%**	**3%**	**16%**	**8%**
Only distributive activities	1	0	1	0	0	1	0	1	0	0	0	0	0
	1%	**0%**	**2%**	**0%**	**0%**	**1%**		**4%**	**0%**	**0%**	**0%**	**0%**	**0%**
Only direct patient care activities	2	2	0	0	0	2	0	0	1	0	1	0	0
	2%	**4%**	**0%**	**0%**	**0%**	**2%**		**0%**	**6%**	**0%**	**3%**	**0%**	**0%**
(n=) **Stewardship Programs**	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Participation in a formal antimicrobial stewardship program	115	32	37	46	45	64	6	23	12	5	30	22	23
	78%	**62%**	**79%**	**94%**	**94%**	**68%**		**82%**	**67%**	**25%**	**94%**	**92%**	**88%**
Participation in a formal controlled substance stewardship program (e.g., opioid stewardship)	18	6	4	8	7	8	3	6	2	1	4	4	1
	12%	**12%**	**9%**	**16%**	**15%**	**9%**		**21%**	**11%**	**5%**	**13%**	**17%**	**4%**

Base: Respondents responding to pharmacy practice models, n = 147; Respondents responding to stewardship programs, n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- Clinical pharmacy practice models were defined differently in the 2020/21 and 2023/24 surveys. The 2020/21 survey used the term "clinical activities", with 42% (59/142) of respondents reporting that pharmacists participated exclusively in clinical activities. In contrast, the 2023/24 survey used the term "direct patient care activities". This is a key distinction, given that a pharmacist may participate in numerous clinical activities, only some of which are considered direct patient care activities. As such, in the 2023/24 survey, only 1% (2/147) of respondents reported that pharmacists participated exclusively in direct patient care activities. In light of this change in terminology, caution should be exercised when results are compared between the two surveys.

- Although it appears that most pharmacists are practising in environments with mostly direct patient care activities and limited distribution activities, there are regional differences to consider **(Table B-6)**. In particular, BC and SK/MB facilities reported greater proportions of pharmacists working in environments with similar amounts of time spent providing distribution and patient care activities.

- Compared to 2020/21, there were notable decreases in the percentages of respondents practising in only distributive activities (from 38% [54/142] in 2020/21 to 1% [1/147] in 2023/24) or mostly distributive activities with limited clinical activities (from 47% [67/142] in 2020/21 to 7% [11/147] in 2023/24).

Table B-7 Evaluation of Clinical Pharmacy Services, 2023/24

Activity being evaluated and by what method	(n=)	All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
The provision of direct patient care pharmacy services is being evaluated	(n=)	(147)	(52)	(47)	(48)	(47)	(94)	(6)	(28)	(18)	(20)	(31)	(24)	(26)
		72	20	28	24	30	39	3	16	13	4	16	10	13
		49%	**38%**	**60%**	**50%**	**64%**	**41%**		**57%**	**72%**	**20%**	**52%**	**42%**	**50%**
Methods used for evaluating the provision of direct patient care pharmacy services	(n=)	(71)	(19)	(28)	(24)	(30)	(38)	(3)	(16)	(13)	(4)	(15)	(10)	(13)
Self-evaluation by pharmacist		50	16	18	16	21	27	2	11	11	4	11	3	10
		70%	**84%**	**64%**	**67%**	**70%**	**71%**		**69%**	**85%**		**73%**	**30%**	**77%**
Retrospective chart review		44	6	18	20	20	22	2	8	10	0	10	10	6
		62%	**32%**	**64%**	**83%**	**67%**	**58%**		**50%**	**77%**		**67%**	**100%**	**46%**
Peer-review evaluation		35	10	12	13	18	17	0	5	9	3	11	3	4
		49%	**53%**	**43%**	**54%**	**60%**	**45%**		**31%**	**69%**		**73%**	**30%**	**31%**
Direct observation		34	8	15	11	13	20	1	6	12	3	7	1	5
		48%	**42%**	**54%**	**46%**	**43%**	**53%**		**38%**	**92%**		**47%**	**10%**	**38%**
Knowledge and competence testing		15	3	3	9	4	11	0	1	2	3	7	1	1
		21%	**16%**	**11%**	**38%**	**13%**	**29%**		**6%**	**15%**		**47%**	**10%**	**8%**
Other – please specify		13	2	7	4	8	5	0	1	2	1	2	1	6
		18%	**11%**	**25%**	**17%**	**27%**	**13%**		**6%**	**15%**		**13%**	**10%**	**46%**

Table B-7 Evaluation of Clinical Pharmacy Services, 2023/24 (Continued)

Activity being evaluated and by what method	(n=)	All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Aspects of clinical practice evaluated	(n=)	(71)	(19)	(28)	(24)	(30)	(38)	(3)	(16)	(13)	(4)	(15)	(10)	(13)
Conformity of documentation with clinical practice		60 **85%**	16 **84%**	23 **82%**	21 **88%**	26 **87%**	32 **84%**	2	11 **69%**	12 **92%**	4	12 **80%**	9 **90%**	12 **92%**
Developent of an individualized pharmaceutical care plan, including its monitoring		46 **65%**	12 **63%**	21 **75%**	13 **54%**	17 **57%**	26 **68%**	3	12 **75%**	12 **92%**	2	9 **60%**	2 **20%**	9 **69%**
Medication counselling and evaluation of adherence		27 **38%**	8 **42%**	12 **43%**	7 **29%**	9 **30%**	16 **42%**	2	10 **63%**	6 **46%**	1	4 **27%**	2 **20%**	4 **31%**
Answers to drug information questions		25 **35%**	8 **42%**	10 **36%**	7 **29%**	8 **27%**	15 **39%**	2	10 **63%**	3 **23%**	1	4 **27%**	2 **20%**	5 **38%**
Other – please specify		15 **21%**	2 **11%**	9 **32%**	4 **17%**	8 **27%**	6 **16%**	1	0 **0%**	3 **23%**	0	5 **33%**	3 **30%**	4 **31%**
Mechanisms have been established to measure patients' medication-related outcomes	(n=)	(147)	(51)	(47)	(49)	(48)	(93)	(6)	(28)	(18)	(19)	(32)	(24)	(26)
		45 **31%**	15 **29%**	12 **26%**	18 **37%**	20 **42%**	23 **25%**	2	4 **14%**	17 **94%**	3 **16%**	6 **19%**	10 **42%**	5 **19%**
The organization collects patient feedback about their experience/ encounter with a hospital pharmacist	(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
		52 **35%**	14 **27%**	15 **32%**	23 **47%**	23 **48%**	26 **28%**	3	7 **25%**	18 **100%**	4 **20%**	12 **38%**	8 **33%**	3 **12%**

Base: Respondents responding to evaluation of clinical activities, n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- Only 49% (72/147) of respondents indicated that their facilities evaluated the provision of direct patient care pharmacy services **(Table B-7)**. There were no substantial changes in the use of evaluation methods since the 2020/21 survey.
- However, in comparison to the 2020/21 survey, more respondents indicated that their facilities were evaluating every listed aspect of clinical practice **(Table B-8)**.

Table B-8 Evaluation of Clinical Pharmacy Practice, 2023/24 vs. 2020/21

Aspect of clinical practice evaluated	2023/24 (n=71)	2020/21 (n=66)
Conformity of documentation with clinical practice	60	51
	85%	**77%**
Development of an individualized pharmaceutical care plan, including its monitoring	46	43
	65%	**65%**
Medication counselling and evaluation of adherence	27	16
	38%	**24%**
Answers to drug information questions	25	13
	35%	**20%**

- Clinical documentation remained the most frequently evaluated element of clinical practice. Pharmacist prescribing and collaboration with other healthcare providers were other aspects of clinical practice that were commonly evaluated.
- AB had the highest percentage of respondents indicating that mechanisms have been established to measure patients' medication-related outcomes (94%, 17/18). QC saw the greatest increase in the percentage of respondents indicating that such mechanisms have been established: from 6% (2/36) in 2020/21 to 42% (10/24) in 2023/24.
- In 2020/21, only ON respondents reported that patient-related outcomes were used to evaluate pharmacist performance. In 2023/24, only one respondent in QC indicated that patient outcomes contributed to the evaluation of some pharmacists' performance.
- Only 35% (52/148) of respondents reported the collection of patient feedback regarding their experience with a hospital pharmacist. This evaluation method was most prevalent in AB, where 100% (18/18) of respondents reported the collection of patient feedback. AB facilities use an adapted version of the Canadian Patient Experiences Survey – Inpatient Care[7] with two additional questions from the Hospital Consumer Assessment of Healthcare Providers and Systems[8] survey pertaining to whether a pharmacist met with a patient at the bedside to discuss their medications and to rate their experience with the pharmacist.

The most common additional information about clinical pharmacy practice provided by respondents related to challenges with pharmacist shortages. Respondents in four provinces (NB, BC, QC and MB) reported that pharmacist shortages had an impact on clinical practice. Some respondents noted an inability to provide clinical services or to backfill clinical program areas when they were short-staffed. Others noted that nursing staff had taken a larger role in medication reconciliation due to pharmacy staffing shortages. To increase the capacity for clinical service delivery, one respondent suggested hiring a clinical coordinator to provide clinical training to non-residency trained pharmacists.

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C - Drug Distribution Systems

Allan Mills

The CSHP Hospital Pharmacy in Canada Survey has consistently investigated the changing patterns of practice in drug distribution. The survey aims to document trends in medication-use systems that will allow organizations and pharmacy departments to benchmark their current practices.

This chapter focuses on medication preparation and dispensing, the use of automated dispensing cabinets (ADCs), pharmacy hours of operation, the processes used to compound sterile and non-sterile medications, the traceability of products and inventory management, among other aspects of medication distribution. We also wanted to investigate the support that inpatient pharmacy departments provide to outpatients, to get a better understanding of how hospital pharmacies support the community.

Drug distribution is the traditional role with which pharmacies are associated, as it is a core component of hospital pharmacy departments in Canada. Drug distribution systems are critical to the provision of care to patients, and significant risks can arise if the functions of these systems are not carried out effectively.[1] From the data presented here, we note that organizations continue to slowly adopt technology and practices designed to improve medication safety. Over time, this adoption has led to medication distribution systems becoming more sophisticated, evolving to enhance patient safety, create efficiencies and improve patient outcomes.[2]

In terms of reporting regional data from the 2023/24 survey, the convention for the four eastern provinces (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and Newfoundland and Labrador [NL]) remains unchanged from prior reports, and these provinces are designated as the Atlantic region or ATL. Although Alberta (AB) did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, it rejoined the survey for 2023/24. However, unlike reports up to 2016/17, in which AB, Saskatchewan (SK) and Manitoba (MB) were combined as the Prairie region, AB is now treated as a region distinct from the SK/MB combination.

Inpatient Drug Distribution Systems

Unit-dose systems have been noted as a safer more effective drug distribution for over 35 years.[3] Historically, the CSHP Hospital Pharmacy in Canada Survey Report has documented the transition from traditional dispensing systems to unit-dose systems. Results of the 2023/24 survey indicated no change in the proportion of acute care hospitals providing unit-dose medications (centralized model) for all or some of their patients (77%, 113/147) since the 2020/21 survey (77%, 110/142). **Figure C-1** details the various drug distribution models primarily used to supply medications to acute care beds in Canada. As in previous surveys, centralized unit-dose systems were reported to supply medications to half of the acute care beds in Canada. The reported use of traditional drug distribution systems dropped to 12% (18/147) in 2023/24 from 21% (30/142) in 2020/21. This is the first time in three surveys that there has been a notable reduction in the use of

traditional distribution systems, a positive trend. The use of decentralized unit-dose systems, whereby unit-dose medications are provided from ADCs located in patient care areas that service overnight beds, was the second most frequent distribution system, with 66% (97/147) of respondents reporting use of this system. The adoption rate noted in this Canadian survey is similar to that reported in a 2022 survey conducted by the American Society of Health-System Pharmacists, in which 75% of respondents in the United States (US) reported using a decentralized system whereby medications were distributed primarily through ADCs.[4] Decentralized unit-dose distribution from ADCs continues to be heavily used, with almost 40% of acute care beds having this as the primary method of drug distribution. This finding suggests that Canadian organizations continue to primarily supply medications in ready-to-use unit-dose packaging, which has been noted to reduce medication errors and improve patient safety.[5] As in previous years, Québec (QC) led the country in use of centralized unit-dose distribution, with 84% of acute care beds being serviced by this system.

Although the number of respondents reporting unit-dose dispensing from satellite pharmacies was low (16%, 23/147), it represented an increase from the 2020/21 survey (8%, 12/142). This result appeared to be influenced by an increase in the number of Ontario (ON) hospitals reporting use of satellite unit-dose systems, though for a small percentage of all beds. The proportion of acute care beds for which this was the primary system of medication supply was only 4%, indicating that it was being used for a select group of beds within these hospitals.

Figure C-1 Drug Distribution Systems Used to Provide Medication, by Percentage of Canadian Acute Care Beds Serviced, 2023/24

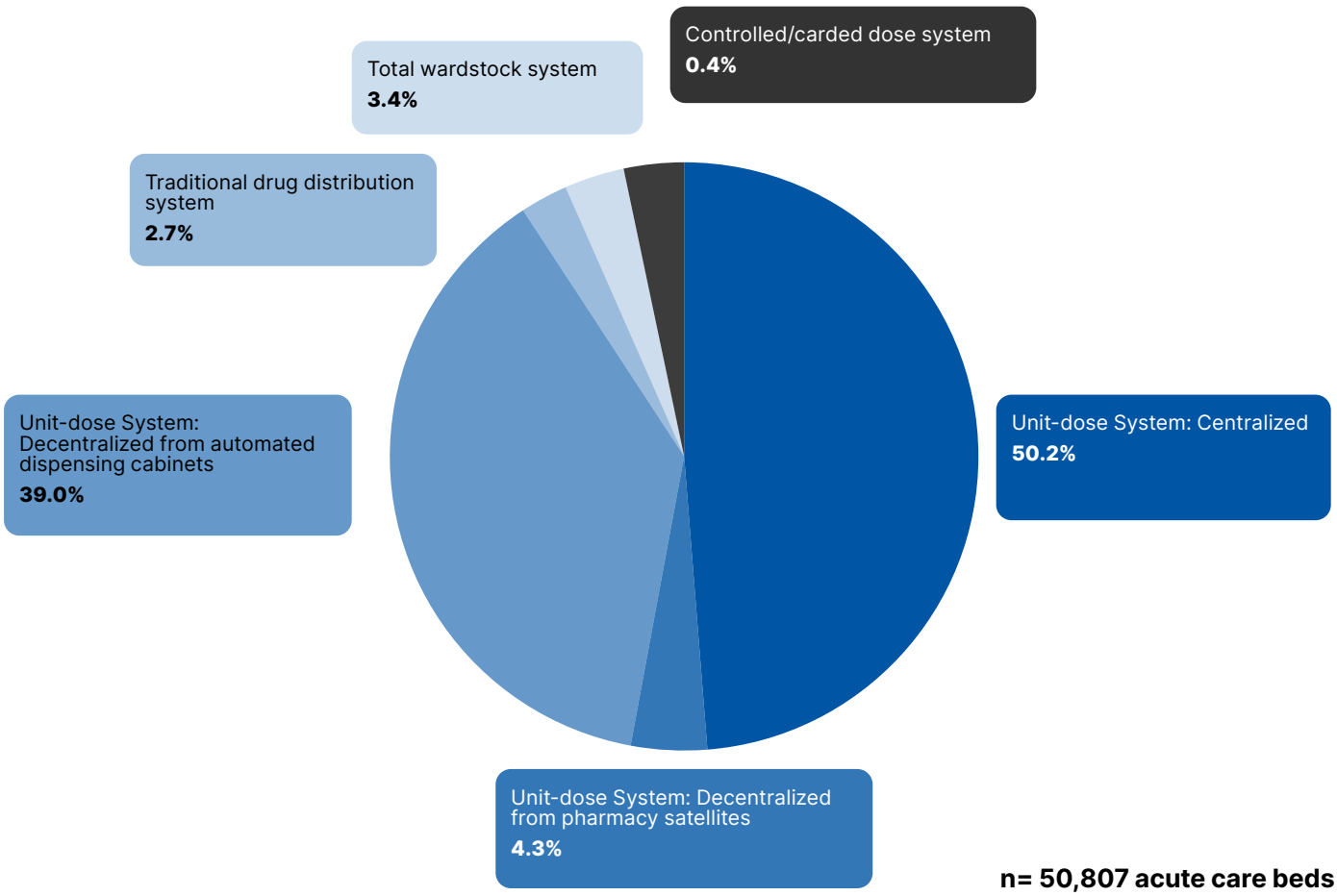


Table C-1 highlights the utilization rates of the various distribution systems by bed size, teaching status and region.

Table C-1 Drug Distribution Systems for Acute Care Beds, 2023/24

Drug distribution system (Multiple Options Allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
	(n=)	(147)	(50)	(48)	(49)	(48)	(93)	(6)	(28)	(18)	(20)	(32)	(24)	(25)
Unit-dose system: centralized (CUD)	Yes	113	32	36	45	36	72	5	21	15	13	25	23	16
		77%	64%	75%	92%	75%	77%		75%	83%	65%	78%	96%	64%
	Average % of beds	50%	33%	44%	73%	55%	48%	51%	50%	64%	24%	47%	84%	33%
Unit-dose system: decentralized from pharmacy satellites (DUD)	Yes	23	4	8	11	11	9	3	4	3	3	7	4	2
		16%	8%	17%	22%	23%	10%		14%	17%	15%	22%	17%	8%
	Average % of beds	4.3%	3%	7%	3%	6%	4%	7%	4%	2%	2%	7%	6%	4%
Unit-dose system: decentralized from automated dispensing cabinets (UDADC)	Yes	97	34	35	28	34	60	3	19	9	14	22	12	21
		66%	68%	73%	57%	71%	65%		68%	50%	70%	69%	50%	84%
	Average % of beds	39%	53%	44%	20%	35%	41%	41%	31%	39%	30%	52%	8%	60%
Traditional drug distribution system – acute care	Yes	18	7	9	2	4	13	1	9	0	5	1	0	3
		12%	14%	19%	4%	8%	14%		32%	0%	25%	3%	0%	12%
	Average % of beds	3%	6%	2%	0.6%	1%	4%	0.2%	4%	0%	14%	<0.1%	0%	1%
Total wardstock system	Yes	40	16	10	14	13	26	1	6	7	6	6	8	7
		27%	32%	21%	29%	27%	28%		21%	39%	30%	19%	33%	28%
	Average % of beds	3%	5%	3%	2%	3%	4%	7%	3%	4%	8%	3%	2%	2%
Controlled/ carded dose system	Yes	10	4	1	5	2	7	1	1	0	1	2	4	2
		7%	8%	2%	10%	4%	8%		4%	0%	5%	6%	17%	8%
	Average % of beds	0.4%	0.4%	0.2%	0.4%	0.2%	0.4%	1.7%	<0.1%	0%	0.3%	0.5%	0.7%	0.6%

Base: All respondents to this question, n = 147
Yes = any use; Average % = average percentage of beds serviced by the particular drug distribution system
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Only 12% (18/147) of respondents reported using traditional medication distribution systems, a decrease compared to previous years.

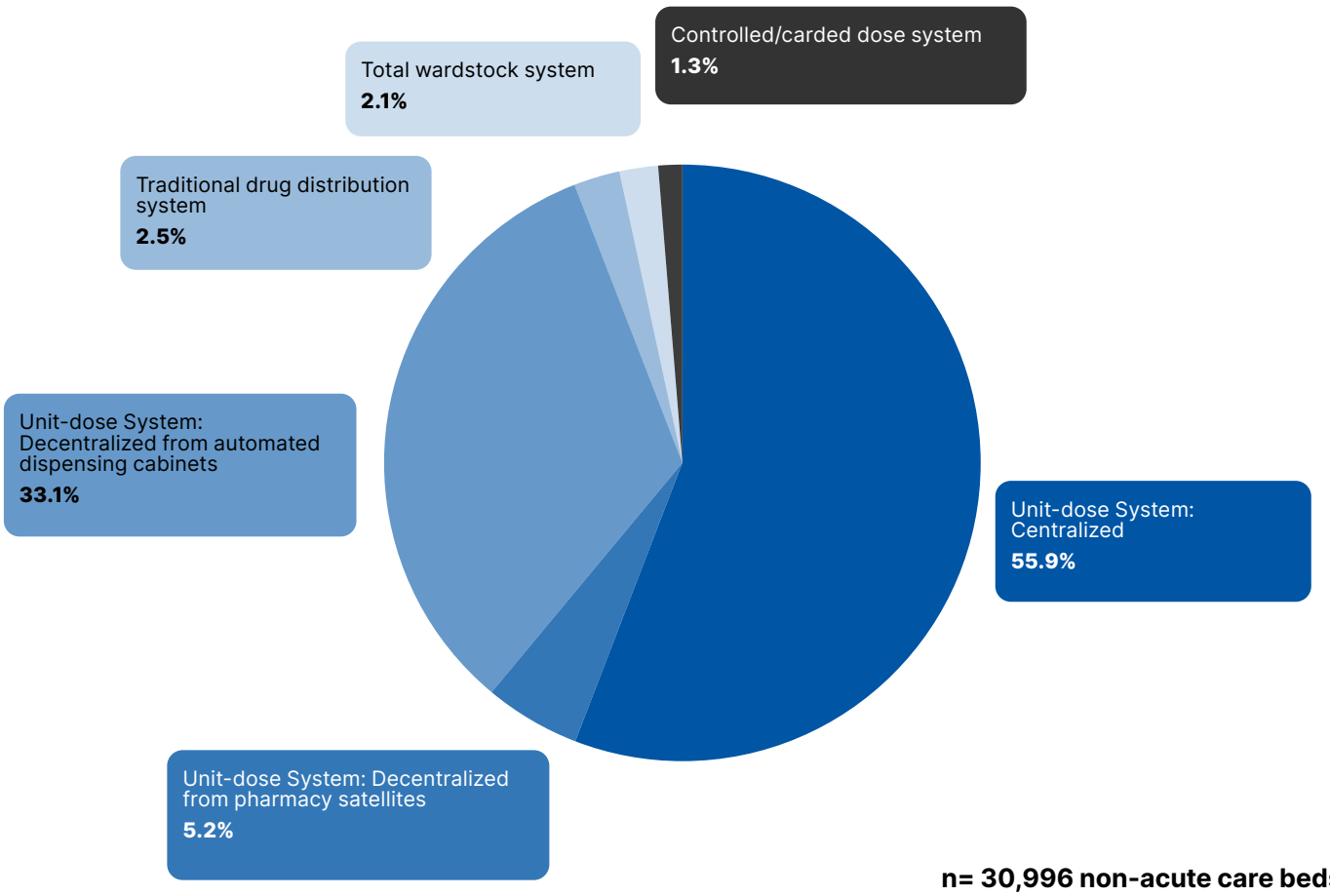
In the early 2000s, the reported use of total wardstock systems (i.e., drug distribution systems in which most medications are stocked on patient care units in bulk containers) was declining in favour of centralized and decentralized unit-dose systems, but then remained steady over the two most recent surveys: 18% (25/142) in 2020/21 and 18% (32/181) in 2016/17. However, in 2023/24, reported use of this distribution

system increased, to 27% (40/147) of respondents, for supplying medications to 3% of acute care beds suggesting more respondents are using this method than in the past.

Centralized unit-dose distribution continues to be the most commonly used distribution system for both acute and non-acute beds.

The system used most often to distribute medications for acute care beds was also used most often for non-acute care beds (**Figure C-2**). More specifically, 56% of non-acute care beds were supplied with medications using a centralized unit-dose distribution system, making it the most prevalent system in Canadian facilities. Decentralized unit-dose distribution from ADCs was used to supply 33% of non-acute care beds, with much lower rates for traditional (2.5%), wardstock (2.1%) and carded (1.3%) systems. Most surprising was that 11% (10/90) of respondents reported using satellite pharmacies for non-acute care beds, supplying 5.2% of all non-acute care beds. This distribution method was prevalent in ON, perhaps because of the trend in ON hospitals of creating off-site non-acute care beds.

Figure C-2 Drug Distribution Systems Used to Provide Medication, by Percentage of Canadian Non-Acute Care Beds Serviced, 2023/24



n= 30,996 non-acute care beds

Robotic Automation to Support the Drug Distribution Model

The use of pharmacy robotic automation (any automated system, such as ROBOT-Rx central pharmacy robotic system [OmniceII], PillPick automated packaging and dispensing system [Swisslog Healthcare] or BoxPicker automated storage and retrieval system [Swisslog Healthcare], in which a robotic arm selects the correct drug from racks holding pre-packaged unit-dose medications) remained stable, with 21% (31/148) of respondents indicating use of these systems **(Table C-2)**. Data from the US appear to suggest a much lower rate of utilization, specifically, 4% of respondents to a 2020 survey.[4] On a regional basis, the highest level of utilization continued to be reported by ON (39%, 13/33), although there was a decline from 2020/21 (44%, 17/39). However, this may be an artifact due to the lower response rate in ON in 2023/24. In British Columbia (BC), 37% (10/27) of respondents reported using robotic systems, a much higher proportion than in 2020/21 (15% 4/27).

Hospitals in Ontario and British Columbia had the highest rate of adoption of robotic automation.

Table C-2 Robotic Automation to Fill Patient-Specific Medications, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(51)	(49)	(48)	(48)	(94)	(6)	(27)	(18)	(20)	(33)	(24)	(26)
Yes	31	5	8	18	16	15	0	10	0	1	13	5	2
	21%	**10%**	**16%**	**38%**	**33%**	**16%**		**37%**	**0%**	**5%**	**39%**	**21%**	**8%**
No	117	46	41	30	32	79	6	17	18	19	20	19	24
	79%	90%	84%	63%	67%	84%		63%	100%	95%	61%	79%	92%

Base: n = 142 respondents
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Robotic automation was reported more often by teaching hospitals (33%, 16/48) and in facilities with more than 500 beds (38%, 18/48).

Automated Dispensing Cabinets

The use of ADCs in any location within the hospital, either as part of a unit-dose dispensing system or as a method of controlling access to certain medications (such as narcotic medications in operating rooms), was reported by 91% (135/149) of respondents **(Table C-3)**. This is similar to the 2020/21 survey results (89%, 126/142), continuing a steady increase from previous surveys (80% [147/184] in 2016/17 and 71% [114/161] in 2013/14). ADC use was reported by all or most respondents in ATL (100%, 26/26), ON (100%, 33/33) and QC (96%, 23/24).

All respondents (100%) in Atlantic Canada and Ontario reported using automated dispensing cabinets in 2023/24

Table C-3 Automated Dispensing Cabinet Use, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(51)	(49)	(49)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Yes	135	43	47	45	46	84	5	24	14	15	33	23	26
	91%	**84%**	**96%**	**92%**	**96%**	**88%**		**86%**	**78%**	**75%**	**100%**	**96%**	**100%**
No	14	8	2	4	2	11	1	4	4	5	0	1	0
	9%	16%	4%	8%	4%	12%		14%	22%	25%	0%	4%	0%

Base: n = 149 respondents
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Teaching hospitals (96%, 46/48) and pediatric hospitals (5/6) were more likely to have ADCs than non-teaching hospitals (88%, 84/95). Almost all regions, sizes and types of hospitals showed greater adoption of ADCs than in previous surveys.

The reported locations of ADC use are summarized in **Table C-4**. For the sixth consecutive survey, the Emergency Department (ED) was the most common location for ADCs, reported by 95% (126/132) of respondents. Adult critical care units remained the second most common location for ADCs, reported by 91% (111/122) of respondents, somewhat lower than in 2021 (94%, 103/109) but still higher than in 2016/17 (87%, 128/147). The third most common location was general adult medical/surgical units, where ADCs were reported by 88% (112/128) of respondents, slightly below the 91% (105/115) of respondents in 2020/21.

Table C-4 Automated Dispensing Cabinet (ADC) Use and Access, 2023/24

Patient care units with medication access from ADCs	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(128)	(41)	(42)	(45)	(46)	(82)	(0)	(23)	(12)	(15)	(32)	(22)	(24)
General adult medical/ surgical unit	112	35	36	41	40	72	0	18	7	13	31	21	22
	88%	**85%**	**86%**	**91%**	**87%**	**88%**		**78%**	**58%**	**87%**	**97%**	**95%**	**92%**
(n=)	(122)	(37)	(40)	(45)	(45)	(76)	(0)	(22)	(11)	(11)	(32)	(22)	(24)
Adult critical care unit	111	32	37	42	43	68	0	18	8	10	31	21	23
	91%	**86%**	**93%**	**93%**	**93%**	**89**		**82%**	**73%**	**91%**	**94%**	**95%**	**96%**
(n=)	(131)	(43)	(44)	(44)	(45)	(81)	(5)	(24)	(12)	(14)	(33)	(23)	(25)
Operating room	87	29	34	24	30	53	4	20	11	7	31	7	11
	66%	**67%**	**77%**	**55%**	**67%**	**65%**		**83%**	**92%**	**50%**	**94%**	**30%**	**44%**
(n=)	(132)	(43)	(44)	(45)	(46)	(81)	(5)	(24)	(12)	(14)	(33)	(23)	(26)
Recovery room	106	34	37	35	37	65	4	19	11	9	33	13	21
	80%	**79%**	**84%**	**78%**	**80%**	**80%**		**79%**	**92%**	**64%**	**100%**	**57%**	**81%**

Table C-4 Automated Dispensing Cabinet (ADC) Use and Access, 2023/24 (Continued)

Patient care units with medication access from ADCs	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(115)	(35)	(38)	(42)	(37)	(72)	(3)	(22)	(10)	(11)	(30)	(21)	(21)
Labour and delivery unit	93	29	31	33	32	58	3	16	8	9	29	12	19
	83%	**83%**	**82%**	**79%**	**86%**	**77%**		**73%**	**80%**	**82%**	**97%**	**57%**	**90%**
(n=)	(112)	(33)	(37)	(42)	(37)	(56)	(3)	(22)	(10)	(11)	(30)	(21)	(18)
Ante-partum/ post-partum units	84	26	28	30	25	56	3	15	5	8	27	13	16
	75%	**79%**	**76%**	**71%**	**68%**	**78%**		**68%**	**50%**	**73%**	**90%**	**62%**	**89%**
(n=)	(112)	(28)	(40)	(44)	(39)	(68)	(5)	(20)	(10)	(11)	(29)	(20)	(22)
Mental health unit	92	21	32	39	32	55	5	16	4	8	26	18	20
	82%	**75%**	**80%**	**89%**	**82%**	**81%**		**80%**	**40%**	**73%**	**90%**	**90%**	**91%**
(n=)	(132)	(43)	(44)	(45)	(45)	(82)	(5)	(24)	(12)	(15)	(33)	(23)	(25)
Emergency Department	126	40	42	44	44	77	5	21	11	14	33	23	24
	95%	**93%**	**95%**	**98%**	**98%**	**94%**		**88%**	**92%**	**93%**	**100%**	**100%**	**96%**
(n=)	(91)	(27)	(30)	(34)	(26)	(60)	(5)	(17)	(7)	(9)	(24)	(15)	(19)
General pediatric medical/ surgical unit	74	23	26	25	19	50	5	15	4	7	20	11	17
	81%	**85%**	**87%**	**74%**	**73%**	**83%**		**88%**			**83%**	**73%**	**89%**
(n=)	(63)	(11)	(26)	(26)	(25)	(33)	(5)	(11)	(9)	(6)	(20)	(8)	(9)
Pediatric critical care unit	49	8	22	19	18	26	5	9	7	5	15	6	7
	78%	**73%**	**85%**	**73%**	**72%**	**79%**		**82%**			**75%**		
(n=)	(103)	(32)	(34)	(37)	(39)	(59)	(5)	(16)	(9)	(9)	(29)	(17)	(23)
Outpatient Clinics	68	24	16	28	20	46	2	12	4	6	27	10	9
	66%	**75%**	**47%**	**76%**	**51%**	**78%**		**75%**			**93%**	**59%**	**39%**
(n=)	(92)	(25)	(34)	(33)	(38)	(52)	(2)	(16)	(11)	(10)	(19)	(19)	(17)
Night cabinet or cupboard	59	18	20	21	20	38	1	7	7	7	11	15	12
	64%	**72%**	**59%**	**64%**	**53%**	**73%**		**44%**	**64%**	**70%**	**58%**	**79%**	**71%**

Base: n = 63-132
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

It has been suggested that the use of ADCs is safer when medications are accessed using patient specific profiles. In the 2023/24 iteration of the survey, respondents were also asked to indicate whether and where they used profiled cabinets; these data are reported in **Table C-5**.

- In 2023/24, profiled cabinets were well utilized in mental health units (96%, 88/92), general medical/ surgical units (94%, 105/112), adult critical care units (89%, 99/111) and ante-partum units (88%, 74/84). ADC profiling was also common in pediatric medical/surgical units (92%, 68/74) and pediatric critical care units (91% 43/47).

- Areas with transient populations, such as the operating room (21%, 18/87), the recovery room (39%, 41/106) and the ED (56%, 71/126), and those with rapid turnover, such as labour and delivery units (65%, 60/93), had lower rates of ADC profiling.

- Two areas that were documented for the first time, outpatient clinics and night cabinets/cupboards, also had relatively low profiling rates: 43% (29/68) and 63% (37/59), respectively.

These data suggest that organizations are selecting areas for ADC profiling according to where they anticipate the benefits will outweigh the operational challenges, such as orders being completed before access to the ADC is required.

Table C-5 Use of Patient-Specific Profiles with Automated Dispensing Cabinets (ADCs), 2023/24

Units with patient specific profiles with ADCs	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n =)	(112)	(35)	(36)	(41)	(40)	(72)	(0)	(18)	(7)	(13)	(31)	(21)	(22)
General adult medical/ surgical unit	105	30	34	41	37	68	0	17	5	12	30	21	20
	94%	**86%**	**94%**	**100%**	**93%**	**94%**		**94%**		**92%**	**97%**	**100%**	**91%**
(n=)	(111)	(32)	(37)	(42)	(43)	(68)	(0)	(18)	(8)	(10)	(31)	(21)	(23)
Adult critical care unit	99	27	33	39	37	62	0	13	5	10	29	21	21
	89%	**84%**	**89%**	**93%**	**86%**	**91%**		**72%**		**100%**	**94%**	**100%**	**91%**
(n=)	(87)	(29)	(34)	(24)	(30)	(53)		(20)	(11)	(7)	(31)	(7)	(11)
Operating room	18	5	5	8	4	13	1	5	1	0	7	4	1
	21%	**17%**	**15%**	**33%**	**13%**	**25%**		**25%**	**9%**		**23%**		**9%**
(n=)	(106)	(34)	(37)	(35)	(37)	(65)	(4)	(19)	(11)	(9)	(33)	(13)	(21)
Recovery room	41	9	11	21	12	28	1	5	1	3	16	10	6
	39%	**26%**	**30%**	**60%**	**32%**	**43%**		**26%**	**9%**		**48%**	**77%**	**29%**
(n=)	(93)	(29)	(31)	(33)	(32)	(58)	(3)	(16)	(8)	(9)	(29)	(12)	(19)
Labour and delivery unit	60	15	19	26	18	41	1	10	4	6	22	10	8
	65%	**52%**	**61%**	**79%**	**56%**	**71%**		**63%**			**76%**	**83%**	**42%**
(n=)	(84)	(26)	(28)	(30)	(25)	(56)	(3)	(15)	(5)	(8)	(27)	(13)	(16)
Ante-partum/ post-partum units	74	19	27	28	21	50	3	13	4	8	23	13	13
	88%	**73%**	**96%**	**93%**	**84%**	**89%**		**87%**			**85%**	**100%**	**81%**
(n=)	(92)	(21)	(32)	(39)	(32)	(55)	(5)	(16)	(4)	(8)	(26)	(18)	(20)
Mental health unit	88	20	30	38	28	55	5	15	3	8	25	18	19
	96%	**95%**	**94%**	**97%**	**88%**	**100%**		**94%**			**96%**	**100%**	**95%**
(n=)	(126)	(40)	(42)	(44)	(44)	(77)	(5)	(21)	(11)	(14)	(33)	(23)	(24)
Emergency Department	71	17	21	33	24	46	1	9	0	8	21	21	12
	56%	**43%**	**50%**	**75%**	**55%**	**60%**		**43%**	**0%**	**57%**	**64%**	**91%**	**50%**
(n=)	(74)	(23)	(26)	(25)	(19)	(50)	(5)	(15)	(4)	(7)	(20)	(11)	(17)
General pediatric medical/ surgical unit	68	20	24	24	16	47	5	13	4	6	20	10	15
	92%	**87%**	**92%**	**96%**	**84%**	**94%**		**87%**			**100%**	**91%**	**88%**
(n=)	(47)	(7)	(22)	(18)	(17)	(25)	(5)	(9)	(7)	(5)	(14)	(6)	(6)
Pediatric critical care unit	43	6	21	16	14	24	5	8	5	5	14	5	6
	91%	**86%**	**95%**	**89%**	**82%**	**96%**					**100%**		

Table C-5 Use of Patient-Specific Profiles with Automated Dispensing Cabinets (ADCs), 2023/24 (Continued)													
Units with patient specific profiles with ADCs	**All**	**Bed Size**			**Hospital Type**			**Region**					
		50-200	**201-500**	**>500**	**Teaching**	**Non-teaching**	**Pediatric**	**BC**	**AB**	**SK/MB**	**ON**	**QC**	**ATL**
(n=)	(67)	(24)	(16)	(27)	(19)	(46)	(2)	(11)	(4)	(6)	(27)	(10)	(9)
Outpatient Clinics	29	8	6	15	9	19	1	4	1	1	15	8	0
	43%	**33%**	**38%**	**56%**	**47%**	**41%**		**36%**			**56%**	**80%**	
(n=)	(59)	(18)	(20)	(21)	(20)	(38)	(1)	(7)	(7)	(7)	(11)	(15)	(12)
Night cabinet or cupboard	37	10	14	13	11	25	1	6	1	4	9	10	7
	63%	**56%**	**70%**	**62%**	**55%**	**66%**					**82%**	**67%**	**58%**

Base: n = 47-126
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Medication Order Entry

Medication orders can be entered into a pharmacy information system (PIS) by any of various healthcare providers, as described below. For the purposes of this survey, a PIS was defined as a computer system used by the pharmacy to maintain an accurate record of drug dispensing activity, patient medication profiles and other relevant patient information. This section of the survey did not consider computerized provider order entry (CPOE) systems, where healthcare providers enter medication orders or other instructions electronically. For more information about CPOE systems, refer to G - Technology.

When a PIS is used, orders can be entered into the system by pharmacists, by pharmacy technicians and/or pharmacy assistants, or by other healthcare providers (e.g., nurse practitioners, dietitians). Some organizations require verification of these entries before they are deemed ready for processing.

Table C-6 shows the individuals reported to enter prescribers' orders in the PIS.

Table C-6 Medication Order Entry into the Pharmacy Information System (PIS) by Professional, 2023/24

		All	Bed Size			Hospital Type			Region					
			50-200	**201-500**	**>500**	**Teaching**	**Non-teaching**	**Pediatric**	**BC**	**AB**	**SK/MB**	**ON**	**QC**	**ATL**
Pharmacists entering prescribers' orders into a PIS	(n=)	(144)	(50)	(46)	(48)	(45)	(93)	(6)	(27)	(16)	(20)	(33)	(23)	(25)
	Has any use	97	37	35	25	25	68	4	25	0	17	21	13	21
		67%	74%	76%	52%	56%	73%		93%	0%	85%	64%	57%	84%
	100%	**19**	**9**	**5**	**5**	**3**	**15**	**1**	**3**	**0**	**8**	**4**	**0**	**4**
		13%	**18%**	**11%**	**10%**	**7%**	**16%**		**11%**	**0%**	**40%**	**12%**	**0%**	**16%**
	50%-99%	13	3	6	4	6	7	0	2	0	4	2	1	4
		9%	6%	13%	8%	13%	8%		7%	0%	20%	6%	4%	16%
	1%-49%	65	25	24	16	16	46	3	20	0	5	15	12	13
		45%	50%	52%	33%	36%	49%		74%	0%	25%	45%	52%	52%
	0%	47	13	11	23	20	25	2	2	16	3	12	10	4
		33%	26%	24%	48%	44%	27%		7%	100%	15%	36%	43%	16%

Table C-6 Medication Order Entry into the Pharmacy Information System (PIS) by Professional, 2023/24 (Continued)

		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacy technicians entering prescribers' orders into a PIS	(n=)	(143)	(50)	(45)	(48)	(45)	(92)	(6)	(27)	(16)	(20)	(33)	(22)	(25)
	Has any use	57 40%	23 46%	20 44%	14 29%	20 44%	35 38%	2	22 81%	0 0%	3 15%	5 15%	8 36%	19 76%
	100%	**2** **1%**	**1** **2%**	**0** **0%**	**1** **2%**	**0** **0%**	**2** **2%**	**0**	**1** **4%**	**0** **0%**	**1** **5%**	**0** **0%**	**0** **0%**	**0** **0%**
	50%-99%	29 20%	14 28%	11 24%	4 8%	9 20%	19 21%	1	17 63%	0 0%	0 0%	3 9%	1 5%	8 32%
	1%-49%	26 18%	8 16%	9 20%	9 19%	11 24%	14 15%	1	4 15%	0 0%	2 10%	2 6%	7 32%	11 44%
	0%	86 60%	27 54%	25 56%	34 71%	25 56%	57 62%	4	5 19%	16 100%	17 85%	28 85%	14 64%	6 24%
Pharmacy assistants entering prescribers' orders into a PIS	(n=)	(145)	(51)	(46)	(48)	(45)	(94)	(6)	(27)	(16)	(20)	(33)	(23)	(26)
	Has any use	50 34%	17 33%	13 28%	20 42%	20 44%	29 31%	1	10 37%	0 0%	5 25%	0 0%	22 96%	13 50%
	100%	**12** **8%**	**0** **0%**	**2** **4%**	**10** **21%**	**6** **13%**	**5** **5%**	**1**	**0** **0%**	**0** **0%**	**0** **0%**	**0** **0%**	**12** **52%**	**0** **0%**
	50%-99%	19 13%	7 14%	3 7%	9 19%	7 16%	12 13%	0	3 11%	0 0%	1 5%	0 0%	10 43%	5 19%
	1%-49%	19 13%	10 20%	8 17%	1 2%	7 16%	12 13%	0	7 26%	0 0%	4 20%	0 0%	0 0%	8 31%
	0%	95 66%	34 67%	33 72%	28 58%	25 56%	65 69%	5	17 63%	16 100%	15 75%	33 100%	1 4%	13 50%
Others (e.g., nurse practitioners, medical assistants, midwives, dentists, dietitians) entering prescribers' orders into the PIS	(n=)	(145)	(51)	(46)	(48)	(45)	(94)	(6)	(27)	(16)	(20)	(33)	(23)	(26)
	Has any use	26 18%	8 16%	9 20%	9 19%	7 16%	17 18%	2	2 7%	2 13%	0 0%	20 61%	0 0%	2 8%
	100%	**5** **3%**	**2** **4%**	**1** **2%**	**2** **4%**	**1** **2%**	**4** **4%**	**0**	**0** **0%**	**2** **13%**	**0** **0%**	**3** **9%**	**0** **0%**	**0** **0%**
	50%-99%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
	1%-49%	21 14%	6 12%	8 17%	7 15%	6 13%	13 14%	2	2 7%	0 0%	0 0%	17 52%	0 0%	2 8%
	0%	119 82%	43 84%	37 80%	39 81%	38 84%	77 82%	4	25 93%	14 88%	20 100%	13 39%	23 100%	24 92%

Base: n = 145
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

- Entry of orders into the PIS by pharmacists remained the most common process, as indicated by 67% (97/144) of respondents. This finding is relatively unchanged from 2020/21 (72%, 102/141); indeed, this has been the dominant system over the past decade.

- Substantial proportions of respondents also reported entry of prescribers' orders by pharmacy technicians (40%, 57/143) and pharmacy assistants (34%, 50/145), again with little change since 2020/21. Other prescribers (including nurse practitioners, physician assistants, respiratory technicians, midwives and dietitians) performed order entry at a rate similar to that in the previous survey: 18% (26/145) in 2023/24 vs. 20% (27/133) in 2020/21.

- One notable exception to the overall pattern in 2023/24 was AB. This province has converted from use of hospital PIS to a provincial CPOE system; as such, pharmacists, pharmacy technicians and pharmacy assistants do not enter medication orders.

Other than BC (81%, 22/27) and ATL (76%, 19/25), which appeared to be using pharmacy technicians for entry of most orders into the PIS, most regions of the country did not rely heavily on pharmacy technicians for this task. Pharmacy assistants were primarily fulfilling this role in QC (96%, 22/23), whereas ATL facilities were using pharmacy assistants (50%, 13/26) in addition to pharmacy technicians. Conversely, none of the ON respondents reported using pharmacy assistants for order entry. Even where order entry by other healthcare providers (nurse practitioners, medical assistants, midwives, dentists, dietitians) was used, most respondents (81%, 21/26) indicated that these professionals entered only 1%–49% of the orders.

Verification of medication order entries continues to be completed primarily by pharmacists **(Table C-7)**, as reported by 47% (46/97) of respondents for orders entered by pharmacists, by 100% (57/57) of respondents for orders entered by pharmacy technicians, by 100% (50/50) of respondents for orders entered by pharmacy assistants and by 92% (24/26) of respondents for orders entered by other healthcare providers. The use of pharmacy technicians and pharmacy assistants to verify orders was infrequent. Another 52% (50/97) of respondents indicated that verification was not required when a pharmacist entered the order. There was little variation across regions and hospital types.

Table C-7 Verification of Medication Order Entry into Pharmacy Information System by Role, 2023/24

		All	Bed Size			Hospital type			Region					
			50-200	201-500	>500	Teaching	Non-Teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacists entering prescribers' orders are verified by:	(n=)	(97)	(37)	(35)	(25)	(25)	(68)	(4)	(25)	(0)	(17)	(21)	(13)	(21)
	Pharmacist	46	19	14	13	12	30	4	10	0	6	8	7	15
		47%	**51%**	**40%**	**52%**	**48%**	**44%**		**40%**		**35%**	**38%**	**54%**	**71%**
	Pharmacy Technician	6	3	0	3	1	5	0	2	0	2	1	0	1
		6%	**8%**	**0%**	**12%**	**4%**	**7%**		**8%**		**12%**	**5%**	**0%**	**5%**
	Pharmacy Assistant	1	1	0	0	0	1	0	0	0	0	0	0	1
		1%	**3%**	**0%**	**0%**	**0%**	**1%**		**0%**		**0%**	**0%**	**0%**	**5%**
	Verification Not Required	50	17	21	12	13	37	0	15	0	10	13	6	6
		52%	**46%**	**60%**	**48%**	**52%**	**54%**		**60%**		**59%**	**62%**	**46%**	**29%**

Table C-7 Verification of Medication Order Entry into Pharmacy Information System by Role, 2023/24 (Continued)

		All	Bed Size			Hospital type			Region					
			50-200	201-500	>500	Teaching	Non-Teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacy technician entering prescribers' orders are verified by:	(n=)	(57)	(23)	(20)	(14)	(20)	(35)	(2)	(22)	(0)	(3)	(5)	(8)	(19)
	Pharmacist	57 **100%**	23 **100%**	20 **100%**	14 **100%**	20 **100%**	35 **100%**	2	22 **100%**	0	3	5	8	19 **100%**
	Pharmacy Technician	2 **4%**	1 **4%**	0	1 **7%**	1 **5%**	1 **3%**	0	1 **5%**	0	1	0	0	0 **0%**
	Pharmacy Assistant	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0	0 **0%**	0	0	0	0	0 **0%**
	Verification Not Required	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0	0 **0%**	0	0	0	0	0 **0%**
Pharmacy Assistant entering prescribers' orders are verified by:	(n=)	(50)	(17)	(13)	(20)	(20)	(29)	(1)	(10)	(0)	(5)	(0)	(22)	(13)
	Pharmacist	50 **100%**	17 **100%**	13 **100%**	20 **100%**	20 **100%**	29 **100%**	1	10 **100%**	0	5	0	22 **100%**	13 **100%**
	Pharmacy Technician	1 **2%**	1 **6%**	0 **0%**	0 **0%**	0 **0%**	1 **3%**	0	0 **0%**	0	1	0	0 **0%**	0 **0%**
	Pharmacy Assistant	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0	0 **0%**	0	0	0	0 **0%**	0 **0%**
	Verification Not Required	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0	0 **0%**	0	0	0	0 **0%**	0 **0%**
Other practitioners (e.g., nurse practitioners, medical assistants) entering prescribers' orders are verified by:	(n=)	(26)	(8)	(9)	(9)	(7)	(17)	(2)	(2)	(2)	(0)	(20)	(0)	(2)
	Pharmacist	24 **92%**	6	9	9	7	15 **88%**	2	2	1	0	19 **95%**	0	2
	Pharmacy Technician	0 **0%**	0	0	0	0	0 **0%**	0	0	0	0	0 **0%**	0	0
	Pharmacy Assistant	0 **0%**	0	0	0	0	0 **0%**	0	0	0	0	0 **0%**	0	0
	Verification Not Required	2 **8%**	2	0	0	0	2 **12%**	0	0	1	0	1 **5%**	0	0

Base: n = 26-97
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Pharmacy Hours of Operation

For the purpose of this survey, the pharmacy's "hours of operation" were defined as the hours when at least one pharmacist was physically present and providing pharmacy services, including review, processing and dispensing of medication orders. In 2023/24, hospital pharmacies in respondents' facilities were open an average of 79 hours/week, similar to the 86 hours/week in 2020/21 and 84 hours/week in 2016/17. To the question of whether their pharmacy was open "24/7" (or 168 hours/week), 11% (17/149) of respondents answered yes, which is higher than in 2020/21 (9%, 13/142). Nine of the 17 hospitals open all the time were in ON. The rate of 24/7 operation was slightly higher for hospitals with > 500 beds (18%, 9/49) and those with 201–500 beds (12%, 6/49) than for those with 50–200 beds (4%, 2/51).

In general, average opening hours continued to be longer for pharmacies in larger than in smaller hospitals. More specifically, pharmacies in hospitals with 50–200 beds had much shorter hours of operation (63 hours/week) than those in hospitals with 201–500 beds (84 hours/week) or > 500 beds (91 hours/week). The average hours of operation for pharmacies in teaching hospitals (90 hours/week) were similar to the average for large hospitals and longer than the average for non-teaching hospitals (76 hours/week). The definition of hours of operation specified that a pharmacist be on site, so these data may not have accounted for off-site coverage during overnight or weekend hours through a shared verification coverage model, such as was reported for smaller hospitals in ON and AB. This could explain the higher rates of verification seen in after-hours review of orders when the pharmacies were closed, as described in the next section.

Just 1 in every 10 Canadian hospital pharmacy departments are open 24/7

After-Hours Medication Order Review

Table C-8 Review of Orders While the Pharmacy Was Closed, 2023/24

Rate at which 95% of medication orders were reviewed before use in each situation	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(113)	(40)	(38)	(35)	(34)	(76)	(3)	(22)	(13)	(19)	(16)	(21)	(22)
From a nightcupboard	16	8	5	3	5	10	2	0	13	19	2	0	1
	14%	**20%**	**13%**	**9%**	**15%**	**13%**		**0%**	**100%**	**100%**	**13%**	**0%**	**5%**
(n=)	(121)	(44)	(42)	(35)	(38)	(80)	(3)	(21)	(11)	(18)	(24)	(22)	(25)
Before medications are accessed from ADC	19	10	7	2	4	15	0	21	11	18	8	0	0
	16%	**23%**	**17%**	**6%**	**11%**	**19%**		**100%**	**100%**	**100%**	**33%**	**0%**	**0%**
(n=)	(120)	(45)	(39)	(36)	(39)	(78)	(3)	(24)	(13)	(19)	(15)	(24)	(25)
Before medications are accessed from wardstock	16	8	5	3	5	10	1	0	13	0	3	0	0
	13%	**18%**	**13%**	**8%**	**13%**	**13%**		**0%**	**100%**	**0%**	**20%**	**0%**	**0%**
(n=)	(128)	(47)	(43)	(38)	(39)	(85)	(4)	(24)	(12)	(19)	(23)	(23)	(26)
Before medication order appears on the MAR	20	4	12	4	6	13	1	5	2	2	8	1	2
	16%	**9%**	**28%**	**11%**	**15%**	**15%**		**21%**	**17%**	**11%**	**35%**	**4%**	**8%**

Base: all respondents to this question; n = 113-128
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

The 2023/24 survey asked whether, during the hours that the pharmacy was closed (i.e., no pharmacist scheduled to be on site), a staff or contract pharmacist, either on call or working off site (i.e., remotely), reviewed at least 95% of all routine medication orders for appropriateness. Orders for which a licensed independent practitioner controlled the ordering, preparation and administration of the medication (e.g., in the operating room) and orders for urgent situations, when any delay would harm the patient, were

excluded. All (100%) of respondents from AB indicated that they reviewed at least 95% of all routine medication orders for therapeutic appropriateness before medications were accessed from a night cupboard, from an ADC or from wardstock, when the pharmacy was closed **(Table C-8)**; such review was performed less often and less consistently in other regions. The substantially higher rate in AB compared to other regions may be due to use of a standard electronic health record throughout the province and sharing of resources. ON also saw an increase in pharmacists reviewing medication orders before medication access.

With the increases in after-hours order review in AB and, to a lesser extent ON, the overall responses improved in 2023/24, such that rates of review before access from night cupboards (14%, 16/113), ADCs (16%, 19/121) and wardstock (13%, 16/120) were all higher than in 2020/21. The only parameter that did not change was review of orders before they appeared on the medication administration record (MAR) (16% [20/128] in 2023/24 vs. 17% [21/126] in 2020/21).

System changes in Alberta led to all respondents now indicating that they review orders before medications are assessed from night cupboards, wardstock and automated dispensing cabinets.

The results from AB show that system changes can lead to improved performance on aspects of safe care that were previously perceived as being difficult to achieve. Other provinces, particularly those with regional health authorities, have an opportunity to learn from the AB experience.

Preparation of Medication Administration Records

The manual preparation of some or all MARs, reported by 14% (20/148) of respondents **(Table C-9)**, remained unchanged from the 2020/21 survey (14%, 20/142). However, there was a shift from hard-copy MARs generated by a PIS to electronic MARs available through a common electronic health record. The use of hard-copy MARs was reported by 45% (66/148) of respondents, down from 61% (86/142) in 2020/21. At the same time, the use of electronic MARs increased to 42% (62/148) from 25% (36/142) in 2020/21.

Regionally, only respondents in SK/MB (50%, 10/20) and ATL (38%, 10/26) reported manual preparation of MARs, with respondents from AB exclusively reporting use of electronic MARs (100%, 18/18). Only ON (85% 28/33) came close to this level of electronic MAR use, with facilities in most other provinces relying more on printed MARs from a PIS **(Table C-9)**. In terms of hospital size, manual MARs were most likely to be used in facilities with 50–200 beds (27%, 14/51).

Table C-9 Preparation of Medication Administration Records (MARs), 2023/24

How MARS are created in the facility	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(51)	(49)	(48)	(48)	(94)	(6)	(27)	(18)	(20)	(33)	(24)	(26)
Handwritten, manual preparation on the patient care units	20	14	4	2	5	14	1	0	0	10	0	0	10
	14%	**27%**	**8%**	**4%**	**10%**	**15%**		**0%**	**0%**	**50%**	**0%**	**0%**	**38%**
Generation of a hard copy by the pharmacy information system, with documentation of administered medication doses done manually	66	23	17	26	20	45	1	20	0	8	5	20	13
	45%	**45%**	**35%**	**54%**	**42%**	**48%**		**74%**	**0%**	**40%**	**15%**	**83%**	**50%**
Creation of an electronically derived MAR through a common database aligned with a pharmacy information system, with documentation of administered medication doses done electronically	62	14	28	20	23	35	4	7	18	2	28	4	3
	42%	**27%**	**57%**	**42%**	**48%**	**37%**		**26%**	**100%**	**10%**	**85%**	**17%**	**12%**

Base: Respondents, n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Parenteral Admixture Services

Non-hazardous Sterile Compounding Services

The 2023/24 survey asked respondents whether an external provider, the pharmacy department or non-pharmacy personnel in patient care areas provided or supported inpatient parenteral admixture services for their facility and the percentage of non-hazardous intravenous and epidural doses administered in their facility that was provided by each group. Respondents reported the same high rate for using external compounders (94%, 135/145), preparing medications within the pharmacy department (94%, 136/145) and having medications prepared in patient care areas by non-pharmacy personnel (94%, 137/145) **(Table C-10)**. The proportion of doses prepared by an external compounder was similar for hospitals with 50–200 beds (23%), those with 210–500 beds (24%) and those with > 500 beds (23%).

In 2023/24, few respondents reported supply of at least 90% of non-hazardous compounded doses through use of external compounders (2%, 3/145), through compounding in the pharmacy department or elsewhere within the organization (3%, 4/145) or by having medications prepared in patient care areas by non-pharmacy personnel (9%, 13/145) **(Table C-11)**. The last of these represents a reduction from 2020/21, when 19% (27/139) of respondents reported that more than 90% of doses were compounded in patient care areas by non-pharmacy personnel. The 2023/24 data suggest that dependence on non-pharmacy personnel for compounding is a core preparation method for non-hazardous sterile medications, although multiple approaches are used, with no single method dominating. Conversely, 68% (98/145) of respondents reported that their pharmacy or organization supplied less than 50% of non-hazardous sterile compounding doses for their organization, up from 2020/21 (58%, 28/48).

Table C-10 Primary Provider of Non-hazardous Sterile Compounding Services, 2023/24

Primary provider		All	Bed Size			Hospital type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC/YT	AB	SK/MB	ON	QC	ATL
Provided by an external contractor (e.g., Baxter-CIVA, Calea, Fresenius Kabi)	(n=)	(145)	(49)	(49)	(47)	47	(95)	(6)	(28)	(16)	(20)	(33)	(24)	(24)
	Any use	135 **94%**	46 **94%**	45 **92%**	44 **94%**	40 **91%**	91 **96%**	4	28 **100%**	13 **81%**	20 **100%**	31 **94%**	20 **83%**	23 **96%**
	Mean % of doses	**23%**	**23%**	**24%**	**23%**	**21%**	**25%**	**8%**	**26%**	**8%**	**32%**	**23%**	**8%**	**15%**
Provided by the pharmacy department or organization (including centralized production centres)	(n=)	(145)	(49)	(49)	(47)	(44)	(95)	(6)	(28)	(16)	(20)	(33)	(24)	(24)
	Any use	136 **94%**	40 **82%**	49 **100%**	47 **100%**	43 **98%**	87 **92%**	6	26 **93%**	16 **100%**	15 **75%**	32 **97%**	24 **100%**	23 **96%**
	Mean % of doses	**32%**	**17%**	**38%**	**42%**	**45%**	**26%**	**43%**	**28%**	**56%**	**13%**	**37%**	**40%**	**24%**
Prepared in patient care areas by non-pharmacy personnel	(n=)	(145)	(49)	(49)	(47)	(44)	(95)	(6)	(28)	(0,16)	(20)	(33)	(24)	(24)
	Any use	137 **94%**	48 **98%**	46 **94%**	43 **91%**	44 **100%**	87 **92%**	6	24 **86%**	16 **100%**	18 **90%**	31 **94%**	24 **100%**	24 **100%**
	Mean % of doses	**44%**	**59%**	**36%**	**38%**	**35%**	**48%**	**51%**	**38%**	**34%**	**53%**	**36%**	**52%**	**56%**

Base: respondents; n = 145
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Table C-11 Primary Provider Used for ≥ 90% of Non-hazardous Sterile Compounding Doses, 2023/24

Primary provider	All	Bed Size			Hospital type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(145)	(49)	(49)	(47)	(44)	(95)	(6)	(28)	(16)	(20)	(33)	(24)	(24)
Provided by an external contractor (e.g., Baxter-CIVA, Calea, Fresenius Kabi)	3 **2%**	2 **4%**	0 **0%**	1 **2%**	0 **0%**	3 **3%**	0	1 **4%**	0 **0%**	2 **10%**	0 **0%**	0 **0%**	0 **0%**
Provided by the pharmacy department or organization (including centralized production centres)	4 **3%**	1 **2%**	2 **4%**	1 **2%**	1 **2%**	2 **2%**	1	0 **0%**	1 **6%**	0 **0%**	2 **6%**	1 **4%**	0 **0%**
Prepared in patient care areas by non-pharmacy personnel	13 **9%**	8 **16%**	2 **4%**	3 **6%**	0 **0%**	12 **13%**	1	2 **7%**	0 **0%**	4 **20%**	1 **3%**	2 **8%**	4 **17%**

Base: respondents; n = 145
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Since 2016/17, the CSHP Hospital Pharmacy in Canada Survey has included questions about compliance with evolving regulatory requirements for sterile compounding. In the 2023/24 survey, questions about compliance with standards for non-hazardous sterile compounding, as set out by the National Association of Pharmacy Regulatory Authorities (NAPRA) and the Ordre des pharmaciens du Québec (OPQ), were consolidated with questions about compliance with physical plant requirements, procedural requirements and environmental testing. At the time of this survey, provincial regulatory authorities had adopted or were in the process of adopting the NAPRA or OPQ compounding standards.

Just over half (53%, 77/146) of respondents indicated that compounding services for non-hazardous medications provided by the pharmacy department or organization took place in a physical space using equipment that complied with all the requirements outlined in the relevant NAPRA or OPQ standards [6-7] **(Table C-12)**. Regionally, the highest levels of compliance were reported from BC (75%, 21/28) and QC (87%, 20/23); compliance with NAPRA requirements was much lower in other regions. Most respondents reported meeting all requirements for compliance with compounding procedures and quality assurance processes (82%, 121/148) and with environmental verification programs (81%, 120/148).

Rates of compliance with all aspects of the NAPRA/OPQ standards, including physical space requirements, procedures and quality assurance processes, and environmental verification, tended to be higher for larger facilities. On a regional basis, QC continued to lead the way, with 100% (24/24) of respondents reporting compliance for both environmental verification and utilization of quality assurance processes; similar high rates of compliance have been reported for QC since 2016/17.

Table C-12 Compliance with NAPRA/OPQ Standards for Non-hazardous Sterile Compounding, 2023/24

NAPRA/OPQ Standard	All	Bed Size			Hospital type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(146)	(50)	(47)	(49)	(47)	(93)	(6)	(28)	(18)	(20)	(32)	(23)	(25)
Compounded in a physical space with equipment that complies with all the requirements outlined	77	22	25	30	20	53	4	21	5	7	16	20	8
	53%	**44%**	**53%**	**61%**	**43%**	**57%**		**75%**	**28%**	**35%**	**50%**	**87%**	**32%**
(n=)	(148)	(50)	(49)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
Compounded using procedures and quality assurance processes that comply with all the requirements	121	35	41	45	39	77	5	22	17	13	30	24	15
	82%	**70%**	**84%**	**92%**	**81%**	**82%**		**79%**	**94%**	**65%**	**94%**	**100%**	**58%**
(n=)	(148)	(50)	(49)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
There is an environmental verification program that meets all the requirements	120	36	37	47	38	76	6	19	18	15	27	24	17
	81%	**72%**	**76%**	**96%**	**79%**	**81%**		**68%**	**100%**	**75%**	**84%**	**100%**	**65%**

Base: respondents; n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
NAPRA = National Association of Pharmacy Regulatory Authorities, OPQ = Ordre des pharmaciens du Québec

Reported compliance with environmental verification requirements has improved, from 66% (71/108) of respondents in 2020/21 to 81% (120/148) in 2023/24. The personnel responsible for this type of verification **(Table C-13)** remained unchanged, with 83% (99/120) of respondents reporting use of an external contractor, and 13% (15/120) indicating use of personnel within the organization. These results were fairly consistent across all regions, with QC (96% (23/24) and ON (93%, 25/27) being most reliant on external contractors. By hospital type, teaching hospitals (92%, 35/38) were most reliant on external providers.

Table C-13 Environmental Verification of Non-hazardous Sterile Compounding, 2023/24

Who performs the verification	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(120)	(36)	(37)	(47)	(38)	(76)	(6)	(19)	(18)	(15)	(27)	(24)	(17)
Personnel in the organization	15	11	1	3	2	12	1	2	4	5	0	1	3
	13%	**31%**	**3%**	**6%**	**5%**	**16%**		**11%**	**22%**	**33%**	**0%**	**4%**	**18%**
External contractors	99	23	34	42	35	60	4	16	11	10	25	23	14
	83%	**64%**	**92%**	**89%**	**92%**	**79%**		**84%**	**61%**	**67%**	**93%**	**96%**	**82%**
Others	6	2	2	2	1	4	1	1	3	0	2	0	0
	5%	**6%**	**5%**	**4%**	**3%**	**5%**		**5%**	**17%**	**0%**	**7%**	**0%**	**0%**

Base: Base: respondents who reported conducting environmental verification; n = 120
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Overall, 89% (132/148) of respondents reported that their facilities had a designated compounding supervisor to monitor and oversee the sterile compounding of non-hazardous medications. All respondents in AB (100%, 18/18), ON (100%, 32/32) and QC (100%, 24/24) and all respondents from pediatric hospitals (6/6) reported the presence of designated supervisors.

Québec continued to lead the nation in terms of compliance with standards for non-hazardous compounding.

Hazardous Sterile Compounding Services

Previous iterations of the CSHP Hospital Pharmacy in Canada Survey found that compounding of hazardous sterile medications was mainly performed by the hospital pharmacy or the organization. This pattern held for the 2023/24 survey, with a mean of 89% of hazardous sterile doses being compounded by the hospital pharmacy or the organization **(Table C-14)**. Much smaller proportions of doses were prepared by external contractors (7%) and by non-pharmacy personnel working in the area (4%). All of the pediatric hospitals reported not using external contractors; in these facilities, 99% of doses were compounded in the pharmacy and 1% were compounded in patient care areas by non-pharmacy personnel. Despite the high proportion of doses prepared by the pharmacy or organization, 2023/24 saw a high rate in any use of external contractors, which was reported by 48% (67/139) of respondents.

Table C-14 Primary Provider of Hazardous Sterile Compounding Services, 2023/24

Primary provider		All	Bed Size			Hospital type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)		(139)	(46)	(46)	(47)	(47)	(86)	(6)	(26)	(15)	(20)	(30)	(24)	(24)
Provided by an external contractor (e.g., Baxter-CIVA, Calea, Fresenius Kabi)	Any use	67 **48%**	20 **43%**	23 **50%**	24 **51%**	28 **60%**	39 **45%**	0	21 **81%**	2 **13%**	5 **25%**	19 **63%**	9 **38%**	11 **46%**
	Mean % of doses	**7%**	**7%**	**9%**	**5%**	**11%**	**5%**	**0%**	**9%**	**<1%**	**2%**	**11%**	**6%**	**7%**
Provided by the pharmacy department or organization (including centralized production centres)	Any use	134 **96%**	43 **93%**	44 **96%**	47 **100%**	45 **96%**	83 **97%**	6	26 **100%**	14 **93%**	20 **100%**	27 **90%**	23 **96%**	24 **100%**
	Mean % of doses	**89%**	**88%**	**86%**	**94%**	**87%**	**90%**	**99%**	**83%**	**86%**	**96%**	**85%**	**93%**	**93%**
Prepared in patient care areas by non-pharmacy personnel	Any use	37 **27%**	8 **17%**	18 **39%**	11 **23%**	15 **32%**	21 **24%**	1	19 **73%**	8 **53%**	2 **10%**	5 **17%**	2 **8%**	1 **4%**
	Mean % of doses	**4%**	**5%**	**5%**	**1%**	**3%**	**5%**	**1%**	**8%**	**14%**	**1%**	**4%**	**<1%**	**<1%**

Rounding may lead to totals that do not equal 100%
Base: Respondents who reported providing hazardous sterile compounding services, n = 139
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Unlike the situation for non-hazardous sterile compounding, for which all available methods were used to meet patients' needs, 81% (112/139) of respondents reported that their pharmacy department or organization provided 90% or more of hazardous compounded doses **(Table C-15)**. More specifically, at least 80% of respondents in all but one of the regions reported this level of compounding by the pharmacy or organization, the exception being BC (50%, 13/26). Only 1% (2/139) of respondents reported relying on non-pharmacy personnel to provide ≥ 90% of doses, and 3% (4/139) reported relying on external providers.

Since its 2016/17 iteration, the CSHP Hospital Pharmacy in Canada Survey has included questions about compliance with the NAPRA or OPQ standards for compounding of hazardous sterile products; however, like the questions regarding non-hazardous compounding, these were consolidated for the 2023/24 survey. More specifically, respondents who reported the provision of hazardous compounding services were asked about compliance with requirements for the physical plant, for procedures and quality processes, and for environmental testing. **Table C-16** summarizes the compliance rates for these parameters. Again, QC respondents had the highest rates of compliance with physical space requirements (95%, 21/22), procedures and quality assurance (100%, 23/23) and environmental testing (100%, 23/23), continuing the pattern observed since 2016/17.

Rates of compliance with these standards were higher for hospitals with > 500 beds than for hospitals with 201–500 or 50–200 beds.

Table C-15 Primary Provider Used for ≥ 90% of Hazardous Sterile Compounding Doses, 2023/24

Primary provider	All	Bed Size			Hospital type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(139)	(46)	(46)	(47)	(47)	(86)	(6)	(26)	(15)	(20)	(30)	(24)	(24)
Provided by an external contractor (e.g., Baxter-CIVA, Calea, Fresenius Kabi)	4	2	2	0	3	1	0	0	0	0	2	1	1
	3%	**4%**	**4%**	**0%**	**6%**	**1%**		**0%**	**0%**	**0%**	**7%**	**4%**	**4%**
Provided by the pharmacy department or organization (including centralized production centres)	112	38	33	41	35	71	6	13	12	19	24	22	22
	81%	**83%**	**72%**	**87%**	**74%**	**83%**		**50%**	**80%**	**95%**	**80%**	**92%**	**92%**
Prepared in patient care areas by non-pharmacy personnel	2	2	0	0	0	2	0	0	1	0	1	0	0
	1%	**4%**	**0%**	**0%**	**0%**	**2%**		**0%**	**7%**	**0%**	**3%**	**0%**	**0%**

Base: respondents who reported providing hazardous sterile compounding doses; n = 139
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Table C-16 Compliance with NAPRA/OPQ Standards for Hazardous Sterile Compounding, 2023/24

NAPRA/OPQ Standard	All	Bed Size			Hospital type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(143)	(48)	(48)	(47)	(46)	(91)	(6)	(27)	(17)	(20)	(31)	(22)	(26)
Compounded in a physical space with equipment that complies with all the requirements outlined	81	19	29	33	28	48	5	19	6	7	16	21	12
	57%	**40%**	**60%**	**70%**	**61%**	**53%**		**70%**	**35%**	**35%**	**52%**	**95%**	**46%**
(n=)	(143)	(47)	(47)	(49)	(47)	(90)	(6)	(27)	(16)	(20)	(31)	(23)	(26)
Compounded using procedures and quality assurance processes that comply with all the requirements	111	28	38	45	37	69	5	19	12	14	27	23	16
	78%	**60%**	**81%**	**92%**	**79%**	**77%**		**70%**	**75%**	**70%**	**87%**	**100%**	**62%**
(n=)	(144)	(48)	(48)	(48)	(46)	(92)	(6)	(28)	(17)	(20)	(30)	(23)	(26)
There is an environmental verification program that meets all the requirements	106	31	33	42	33	67	6	15	13	16	24	23	15
	74%	**65%**	**69%**	**88%**	**72%**	**73%**		**54%**	**76%**	**80%**	**80%**	**100%**	**58%**

Base: Respondents; n = 144
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
NAPRA = National Association of Pharmacy Regulatory Authorities, OPQ = Ordre des pharmaciens du Québec

Table C-17 Environmental Verification of Hazardous Sterile Compounding, 2023/24

Who performs the verification	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(106)	(31)	(33)	(42)	(33)	(67)	(6)	(15)	(13)	(16)	(24)	(23)	(15)
Personnel in the organization	13	7	3	3	4	8	1	0	3	2	3	2	3
	12%	**23%**	**9%**	**7%**	**12%**	**12%**		**0%**	**23%**	**13%**	**13%**	**9%**	**20%**
External contractors	88	23	28	37	29	55	4	14	9	14	19	20	12
	83%	**74%**	**85%**	**88%**	**88%**	**82%**		**93%**	**69%**	**88%**	**79%**	**87%**	**80%**
Others	5	1	2	2	0	4	1	1	1	0	2	1	0
	5%	**3%**	**6%**	**5%**	**0%**	**6%**		**7%**	**8%**	**0%**	**8%**	**4%**	**0%**

Base: Respondents who reported conducting environmental verification; n = 106
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Only one respondent reported the presence of a medical surveillance program (e.g., urine testing or blood monitoring) for employees who handle cytotoxic/hazardous drugs. This was a drastic decrease from rates observed in previous surveys, although it should be noted that the definitions used in questions about medical surveillance were changed for the 2023/24 survey. The rarity of medical surveillance programs in 2023/24 is surprising, and follow-up in future surveys is warranted.

The use of an external provider for environmental verification of hazardous sterile compounding **(Table C-17)** was slightly higher in 2023/24, reported by 83% (88/106) of respondents compared to 80% (57/71) in 2020/21. A much lower proportion of respondents reported using personnel within the organization (12%, 13/106). These results were consistent across all regions. Only respondents from AB (23%, 3/13) and ATL (20%, 3/15) reported using internal personnel to a slightly greater extent.

Most respondents reported designation of a sterile compounding supervisor to monitor and oversee activities related to sterile compounding of hazardous compounds (82%, 119/145) **(Table C-18)**, comparable to 2020/21 (80%, 103/129). All respondents from QC (100%, 23/23) and from pediatric hospitals (6/6) reported assignment of this role, which appears to be more common in larger organizations.

Table C-18 Supervisor Designated to Monitor Hazardous Sterile Compounding, 2023/24

A sterile compounding supervisor has been designated to monitor and oversee activities related to sterile compounding	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(145)	(48)	(48)	(49)	(47)	(92)	(6)	(28)	(17)	(20)	(31)	(23)	(26)
Yes	119	34	40	45	41	72	6	21	13	13	28	23	21
	82%	**71%**	**83%**	**92%**	**87%**	**78%**		**75%**	**76%**	**65%**	**90%**	**100%**	**81%**
No	26	14	8	4	6	20	0	7	4	7	3	0	5
	18%	**29%**	**17%**	**8%**	**13%**	**22%**		**25%**	**24%**	**35%**	**10%**	**0%**	**19%**

Base: All respondents to this question, n = 145
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

For most regions, compliance with this standard increased from 2020/21 to 2023/24. The exception was ON, where 100% (33/33) of respondents in 2020/21 but only 90% (28/31) in 2023 indicated designation of a supervisor to monitor hazardous compounding. Given that the NAPRA standard has not changed, this reduction in compliance is of potential concern.

Closed-System Transfer Devices

Starting in 2020/21, the survey has asked about the use of closed-system transfer devices (CSTDs). In 2023/24, 80% (108/135) of respondents reported using CSTDs **(Table C-19)**, an increase from the 53% (71/133) of respondents who reported using them in 2020/21. Notably, 100% of respondents in BC (25/25), AB (13/13) and ATL (23/23) reported using CSTDs in 2023/24. For ATL, this represents consistency over time, as 100% (16/16) of respondents from this region indicated use of CSTDs in 2020/21. Of the respondents who reported using CSTDs, 52% (56/108) were using them for all hazardous medications, whereas the remaining 48% (52/108) were using them for only some medications. Of the 12 QC respondents who reported using CSTDs, 75% were using them for only some of the medications being compounded, the highest rate of any region. Overall, the utilization of CSTDs has been increasing over time, and it appears that most organizations are now using them, although there remains a divide between facilities using CSTDs for all hazardous products and those using CSTDs for only some.

Table C-19 Use of Closed System Transfer Devices (CSTDs), 2023/24

Use of CSTD	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(135)	(42)	(46)	(47)	(44)	(85)	(6)	(25)	(13)	(20)	(31)	(23)	(23)
Using	108	33	39	36	36	67	5	25	13	7	28	12	23
	80%	**79%**	**85%**	**77%**	**82%**	**79%**		**100%**	**100%**	**35%**	**90%**	**52%**	**100%**
Of those using: Yes for some meds	52	14	14	24	23	26	3	12	8	1	12	9	10
	48%	**42%**	**36%**	**67%**	**64%**	**39%**		**48%**	**62%**		**43%**	**75%**	**43%**
Of those using: Yes for all meds	56	19	25	12	13	41	2	13	5	6	16	3	13
	52%	**58%**	**64%**	**33%**	**36%**	**61%**		**52%**	**38%**		**57%**	**25%**	**57%**
Of those using: Use to extend beyond use date	37	12	8	17	11	26	0	0	1	1	20	4	11
	34%	36%	21%	47%	31%	39%		0%	8%		71%	33%	48%

Base: All respondents to this question, n = 135
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Of respondents reporting use of CSTDs, 34% (37/108) indicated use of these devices to extend the beyond-use date of hazardous medications.

Ontario had the highest utilization of closed-system transfer devices (71%, 20/31) to extend beyond use dating.

Automation in Parenteral Admixing

Over half (62%, 92/149) of respondents reported not using automation to prepare parenteral admixtures, unchanged from 2020/21 (61%, 86/140). Among respondents from QC and ATL, 75% (18/24) and 73% (19/26), respectively, reported not using automation. Among respondents who reported the use of automation, automated compounding devices were most frequently used (26%, 39/149), in particular, at all pediatric hospitals (6/6). The reported use of automated syringe-filling devices decreased from 24% (33/140) in 2020/21 to 13% (20/149) in 2023/24.

Traceability

The ability to track medications is important, given the necessity of determining the brand and lot of medication that each patient has received in cases of a recall. Nationally, there was an increase in this capability, from 50% (71/142) of respondents in 2020/21 to 64% (95/149) of respondents in 2023/24 indicating that they could provide traceability information for any medication product. The rate was 100% (18/18) among AB respondents, and the rate increased with increasing hospital size **(Table C-20)**.

Table C-20 Traceability of Products, 2023/24

Traceability	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(51)	(49)	(49)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Yes (any product)	95	28	31	36	30	61	4	14	18	8	24	19	12
	64%	**55%**	**63%**	**73%**	**63%**	**64%**		**50%**	**100%**	**40%**	**73%**	**79%**	**46%**
Yes – hazardous parenteral	83	26	24	33	28	52	3	8	18	8	21	17	11
	87%	**93%**	**77%**	**92%**	**93%**	**85%**		**57%**	**100%**		**88%**	**89%**	**92%**
Yes - Vaccines	73	17	23	33	26	44	3	6	17	5	23	17	5
	77%	**61%**	**74%**	**92%**	**87%**	**72%**		**43%**	**94%**		**96%**	**89%**	**42%**
Yes - nonhazardous parenteral	72	21	26	25	24	45	3	8	18	4	18	13	11
	76%	**75%**	**84%**	**69%**	**80%**	**74%**		**57%**	**100%**		**75%**	**68%**	**92%**
Yes - Oral Solids	44	11	16	17	17	25	2	4	18	3	10	7	2
	46%	**39%**	**52%**	**47%**	**57%**	**41%**		**29%**	**100%**		**42%**	**37%**	**17%**
Yes - Topical Agents	40	11	15	14	13	25	2	5	18	3	6	7	1
	42%	**39%**	**48%**	**39%**	**43%**	**41%**		**36%**	**100%**		**25%**	**37%**	**8%**
Other	14	3	6	5	3	10	1	2	3	0	7	2	0
	15%	**11%**	**19%**	**14%**	**10%**	**16%**		**14%**	**17%**		**29%**	**11%**	**0%**

Base: Respondents, n = 149; respondents with traceability, n = 95
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

AB respondents also reported full traceability for hazardous parenteral medications, non-hazardous medications, oral solids and topical agents (100%, 18/18 for all). Nationally, it appears that facilities have prioritized the traceability of hazardous parenteral medications (87%, 83/95), vaccines (77%, 73/92) and non-hazardous parenteral medications 76% (72/95) over oral solids (46%, 44/95), topical agents (42%, 40/95) and other medications (15%, 14/95).

Although the overall rate reported was higher than in previous surveys, hospitals with > 500 beds (73%, 36/49) were more likely to have this capability than those with 201–500 beds (63%, 31/49) or 50–200 beds (55%, 28/55).

Interestingly, teaching status did not appear to affect traceability. Most respondents who reported product traceability used a manual process (61%, 58/95); the use of barcoding within a hospital information system increased to 43% (41/95) compared to 28% (20/71) in 2020/21. Stand-alone systems continued to be used by less than one-fifth of respondents (18%, 17/95). It should be noted that respondents could report using more than one system.

Provision of Medications to Community-Based Outpatients

In the 2023/24 survey, questions were introduced regarding the degree to which facilities provided medications to community-based outpatients without compensation to the pharmacy department. Overall, 41% (60/148) of respondents indicated that they provided medications to community-based patients without any compensation **(Table C-21)**. Some regions had particular areas of focus, with 100% (14/14) of BC respondents reporting the provision of home IV medications and 100% (14/14) of ON respondents reporting the provision of clozapine. Regionally, BC and ATL had the highest reported rates of supplying home IV medications, whereas except for one respondent from ATL, the provision of clozapine was reported only by ON respondents. These stark differences among the regions are most likely the result of regional differences in public policy.

Table C-21 Provision of Medications to Community-Based Outpatients without Compensation to Facility's Pharmacy Department, 2023/24

Services	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(51)	(49)	(48)	(47)	(95)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
Yes (any product)	60	19	22	19	22	36	2	14	2	6	14	9	15
	41%	**37%**	**45%**	**40%**	**47%**	**38%**		**50%**	**11%**	**30%**	**42%**	**39%**	**58%**
Yes – Provides Home IV meds	40	15	13	12	13	26	1	14	2	6	1	4	13
	67%	**79%**	**59%**	**63%**	**59%**	**72%**		**100%**			**7%**		**87%**
Yes - Provides Special Access meds	28	6	8	14	12	14	2	4	2	2	3	9	8
	47%	**32%**	**36%**	**74%**	**55%**	**39%**		**29%**			**21%**		**53%**
Yes – Provides Oral Oncology Meds	20	6	7	7	6	13	1	8	1	2	0	6	3
	33%	**32%**	**32%**	**37%**	**27%**	**36%**		**57%**			**0%**		**20%**
Yes- Provides Clozapine	15	3	7	5	7	8	0	0	0	0	14	0	1
	25%	**16%**	**32%**	**26%**	**32%**	**22%**		**0%**			**100%**		**7%**
Yes – Provides HIV meds	14	4	5	5	5	8	1	5	2	2	2	1	2
	23%	**21%**	**23%**	**26%**	**23%**	**22%**		**36%**			**14%**		**13%**
Yes – Provides STI meds	12	4	4	4	3	9	0	3	2	3	2	1	1
	20%	**21%**	**18%**	**21%**	**14%**	**25%**		**21%**			**14%**		**7%**
Yes- Provides organ transplant meds	6	1	2	3	4	1	1	1	1	1	1	0	2
	10%	**5%**	**9%**	**16%**	**18%**	**3%**		**7%**			**7%**		**13%**
Yes – Provides TB meds	5	0	3	2	2	2	1	0	2	0	1	1	2
	8%	**0%**	**14%**	**11%**	**9%**	**6%**		**0%**			**7%**		**23%**
Yes- provides Hospital home care (virtual care)	4	0	1	3	3	1	0	1	0	0	0	2	1
	7%	**0%**	**5%**	**16%**	**14%**	**3%**		**7%**			**0%**		**7%**

Base: respondents n = 148; then respondents involved with community based outpatients without compensation; n = 60
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
STI = sexually transmitted infection, TB = tuberculosis

Inventory Control

The average inventory turnover ratio dropped in 2020/21, to 7.8 per year, and in 2023/24 there was a slight decline to 7.4 per year **(Table C-22)**. There were regional differences, with ON (10.4) and QC (9.4) reporting higher inventory turns, while BC (4.7), AB (3.7) and SK/MB (4.6) had lower inventory turns. In 2020/21, it was suspected that the COVID-19 pandemic might have driven a reduction in inventory turns as facilities increased their inventories to counter potential stock shortages. Overall, the rates slightly declined in 2023/24, which suggests a reluctance to return to high inventory turns to reduce stock on hand. Notably, the provincial government in QC has mandated that organizations maintain a 90-day supply of critical drugs and a 60-day supply for other medications, yet facilities in that province reached an average of 9.4 inventory turns.

Table C-22 Inventory Turnover Ratios, 2023/24

Turnover ratio	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(120)	(39)	(39)	(42)	(43)	(71)	(6)	(19)	(16)	(13)	(28)	(22)	(22)
Average	**7.4**	**6.4**	**6.8**	**8.8**	**7.6**	**7.3**	**6.8**	**4.7**	**3.7**	**4.6**	**10.4**	**9.4**	**8.1**
SD	5.6	5.7	4.8	5.9	4.7	6.2	1.5	8.2	2.2	1.4	4.6	5.4	4.2
Median	**7**	**5.8**	**6.0**	**8.5**	**7.8**	**6.2**	**7.0**	**1.0**	**3.7**	**4.2**	**10.0**	**8.2**	**8.5**

Base: respondents providing inventory turnover ratio; n = 120

Canadian hospital pharmacies have not reduced their on-hand stock since the COVID-19 pandemic, with an average of 7.4 inventory turns per year.

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D - Human Resources

André Bonnici

Effective health workforce planning involves analyzing both healthcare worker and patient population factors. It requires evaluating the number and types of providers, their skills and expertise, and the services they deliver to specific patient groups to meet care goals and improve health outcomes.[1] For pharmacy professionals, workload pressures and staffing shortages are commonly cited sources of stress and burnout.[1]

According to the Canadian Institute of Health Information (CIHI), Canada had a total of 48,312 pharmacists in 2023, for an average of 120.5 pharmacists per 100,000 people.[2] Ontario (ON) was reported to have the highest number of pharmacists, with 17,564; however, Saskatchewan (SK) had the highest number of pharmacists on a per capita basis, with 142.8 per 100,000 people.[2] For the same year (2023), CIHI reported an average of 36 pharmacy technicians per 100,000 people.[2] The province with the highest number of pharmacy technicians was ON, with 5,895, whereas Newfoundland and Labrador (NL) had the highest number per capita, with 52.5 pharmacy technicians per 100,000 people.[2] There were no data reported for pharmacy technicians in Nunavut, Northwest Territories, Yukon or Québec (QC).[2] The numbers of pharmacists and pharmacy technicians in Canada have been relatively stable, with only small changes between 2019 and 2023.

Canada has seen only a marginal increase in pharmacist graduates over the past decade, from 1,180 in 2014 to 1,275 in 2023.[3] More than 60% of pharmacists employed in direct patient care in this country graduated from a Canadian institution.[3] The percentage of pharmacists employed in direct patient care in a hospital environment has been consistent over the past decade: 20.4% in 2023, up from 19.7% in 2014.[3] To date, CIHI has not reported on numbers of pharmacy technician graduates or percentage of technicians working in hospital practice. However, the National Association of Pharmacy Regulatory Authorities (NAPRA) reported that, as of January 2025, the proportion of pharmacy technicians practicing in hospitals was 57% in ON, 46% in Alberta (AB) and 61% in British Columbia (BC).[4] Until recently, QC did not have pharmacy technicians, but the province's first pharmacy technicians graduated in 2024.

This chapter aims to assist leaders in understanding the structure of the hospital pharmacy workforce within Canada. It provides insight into hospital workforce distribution between pharmacy staff and managers, numbers of full-time equivalents (FTEs) as a function of patient days and inpatient or outpatient practice environment, hospital beds, vacancy rates, and salaries of pharmacy professionals and management.

In terms of reporting regional data from the 2023/24 survey, the convention for the four eastern provinces (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and NL) remains unchanged from prior reports, and these provinces are designated as the Atlantic region or ATL. Although AB did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, it rejoined the survey for 2023/24. However, unlike reports up to 2016/17, in which AB, SK and

Manitoba (MB) were combined as the Prairie region, AB is now treated as a region distinct from the SK/MB combination.

Human Resource Shortages – Pharmacists

Respondents were asked to report vacancy rates both with and without counting staff members on leave of absence (LOA). This allows the reader to appreciate the proportion of staff shortages that are due to temporary absences, as opposed to lack of incumbent staff. Vacancy rates do not necessarily indicate whether patients' needs for pharmaceutical care are or are not being met; rather, higher rates may simply reflect insufficient funding to create needed positions. It would be advisable for all directors of pharmacy to perform a gap analysis to document unmet service needs in the context of current staffing. Equal access to pharmaceutical care for all patients should be a goal toward which all pharmacy departments strive.

As of March 31, 2024, the total number of pharmacist positions (staff + advanced practice) reported by respondents was 4,257 **(Table D-1)**, up from 3,071 as of March 31, 2021. This important increase in staffing is due to the participation of AB in the 2023/24 survey after being absent from the 2020/21 survey.

- The vacancy rate for hospital pharmacists (staff + advanced practice), excluding LOAs, was 6.2% (264.2/4,257). This is higher than the 5.1% (156.6/3,071) reported for 2020/21. The vacancy rate including LOAs was 9.3% (395.5/4,257), a slight increase from the 8.0% (244.9/3,071) reported for 2020/21.

- The highest pharmacist vacancy rates excluding LOA occurred in ATL, at 12.5% (58.6/469), followed by BC, with 10.0% (56.1/561), and QC, with 9.0% (100.6/1,122). However, with inclusion of LOAs, QC was the region with the highest vacancy rate (16.8%, 188.6/1,122), followed by ATL (13.7%, 64.3/469).

- The vacancy rate for pharmacist manager positions was low (2.4%, 7.5/317), as generally seen in previous reports.

The vacancy rate for hospital pharmacists in the United States (US), as reported for 2022, was 4.7%,[5] lower than the Canadian rate in 2023/24.

Human Resource Shortages – Pharmacy Technicians and Pharmacy Assistants

As of March 31, 2024, the total reported numbers of positions for pharmacy technicians and pharmacy assistants were 2,842 (up from 2,153 in 2020/21) and 2,424 (up from 1,832 in 2020/21), respectively. The province with the most pharmacy assistants was QC, with 1,679, where this staffing category continued to account for most of the technical workforce. As noted above, the province's first pharmacy technicians graduated at the end of the survey period, so there should be a shift in technical personnel towards pharmacy technicians in QC in the coming years.

- The vacancy rate for pharmacy technicians excluding LOAs was up, 6.3% (179.1/2,842), compared to 4.4% (93.7/2,153) in 2020/21.

- The highest pharmacy technician vacancy rates excluding LOAs occurred in ATL and BC, with 18.7% (70.2/376) and 9.3% (53.0/572), respectively. Of note for ATL, the higher rate when excluding LOAs

compared to when LOAs are included (15.7% 59.0/376) may indicate the definition was not well understood by responders. However, the vacancy rates in ATL remain the highest in Canada for this category of employee.

- The vacancy rate for pharmacy assistants excluding LOAs was lower, at 3.3% (80.0/2,424), compared to 7.6% (139.1/1,832) for 2020/21. However, the vacancy rate increased to 9.2% (224.0/2,424) when pharmacy assistants on LOA were included. This was mainly driven by QC, which had a vacancy rate, of 11.2% (188.8/1,679) and is over represented in this category of employee.
- In the US, the vacancy rate for pharmacy technicians, as reported for 2022, was 12.3%[5], higher than the 2023/24 Canadian rates for either pharmacy technicians or pharmacy assistants.

Table D-1 Positions Vacant as of March 31, 2024

Position		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacists (staff + advanced)	(n=)	(132)	(45)	(46)	(41)	(42)	(84)	(6)	(23)	(17)	(20)	(26)	(22)	(24)
	Total number of positions	4,257	404	1,224	2,629	2,208	1,874	174	561	532	322	1,250	1,122	469
	Vacant Positions (non-LOA)	264.2	47.2	75.2	141.8	130.0	126.9	7.3	56.1	8.9	19.0	21.0	100.6	58.6
	Vacancy rate (non-LOA) %	**6.2%**	**11.7%**	**6.1%**	**5.4%**	**5.9%**	**6.8%**	**4.2%**	**10.0%**	**1.7%**	**5.9%**	**1.7%**	**9.0%**	**12.5%**
	Vacant Positions (including-LOA)	395.5	58.3	86.9	250.3	179.6	202.0	13.9	56.3	27.4	31.5	27.4	188.6	64.3
	Vacancy rate (including-LOA) %	**9.3%**	**14.4%**	**7.1%**	**9.5%**	**8.1%**	**10.8%**	**8.0%**	**10.0%**	**5.1%**	**9.9%**	**2.2%**	**16.8%**	**13.7%**
Pharmacist Manager	(n=)	(102)	(35)	(30)	(37)	(35)	(62)	(5)	(16)	(14)	(16)	(18)	(21)	(17)
	Total number of positions	317	42	68	207	153	151	13	45	20	23	66	130	34
	Vacant Positions (non-LOA)	7.5	1.0	2.5	4.0	1.0	6.5	0.0	2.0	0.0	1.0	2.0	2.5	0.0
	Vacancy rate (non-LOA) %	**2.4%**	**2.4%**	**3.7%**	**1.9%**	**0.7%**	**4.3%**	**0%**	**4.5%**	**0%**	**4.4%**	**3.1%**	**1.9%**	**0%**
	Vacant Positions (including-LOA)	16.7	1.0	3.5	12.2	6.0	10.7	0.0	3.0	0.0	1.0	2.0	9.7	1.0
	Vacancy rate (including-LOA) %	**5.3%**	**2.4%**	**5.1%**	**5.9%**	**3.9%**	**7.0%**	**0%**	**6.7%**	**0%**	**4.4%**	**3.1%**	**7.5%**	**2.9%**

Table D-1 Positions Vacant as of March 31, 2024 (Continued)

Position		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacy Technician Manager	(n=)	(58)	(17)	(24)	(17)	(23)	(34)	(1)	(13)	(13)	(7)	(13)	(1)	(11)
	Total number of positions	86	18	34	34	38	47	2	25	17	13	19	n/a	13
	Vacant Positions (non-LOA)	2.0	0.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	n/a	1.0
	Vacancy rate (non-LOA) %	**2.3%**	**0%**	**2.9%**	**3.0%**	**2.7%**	**2.1%**	**0%**	**0%**	**0%**	**0%**	**5.3%**	**n/a**	**7.8%**
	Vacant Positions (including-LOA)	1.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	n/a	1.0
	Vacancy rate (including-LOA) %	**1.2%**	**0%**	**2.9%**	**0%**	**2.7%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**n/a**	**7.8%**
Pharmacy Technician	(n=)	(97)	(38)	(40)	(19)	(31)	(61)	(5)	(21)	(13)	(15)	(25)	n/a	(23)
	Total number of positions	2,842	463	1,008	1,371	1,302	1,411	129	572	384	167	1,343	n/a	376
	Vacant Positions (non-LOA)	179.1	34.4	84.1	60.6	97.6	68.5	13.0	53.0	2.9	9.0	44.0	n/a	70.2
	Vacancy rate (non-LOA) %	**6.3%**	**7.4%**	**8.3%**	**4.4%**	**7.5%**	**4.9%**	**10.1%**	**9.3%**	**0.8%**	**5.4%**	**3.3%**	**n/a**	**18.7%**
	Vacant Positions (including-LOA)	210.2	33.2	96.1	80.9	95.6	96.0	18.6	62.0	17.8	17.0	54.4	n/a	59.0
	Vacancy rate (including-LOA) %	**7.4%**	**7.2%**	**9.5%**	**5.9%**	**7.3%**	**6.8%**	**14.4%**	**10.8%**	**4.6%**	**10.2%**	**4.0%**	**n/a**	**15.7%**
Pharmacy Assistant	(n=)	(78)	(25)	(24)	(29)	(28)	(47)	(3)	(10)	(13)	(14)	(6)	(21)	(14)
	Total number of positions	2,424	147	343	1,935	1,361	996	67	74	257	162	29	1,679	223
	Vacant Positions (non-LOA)	80.0	4.5	15.0	60.5	60.3	16.7	3.0	3.0	3.0	4.3	0.0	56.2	13.5
	Vacancy rate (non-LOA) %	**3.3%**	**3.1%**	**4.4%**	**3.1%**	**4.4%**	**1.7%**	**4.4%**	**4.1%**	**1.2%**	**2.7%**	**0%**	**3.3%**	**6.0%**
	Vacant Positions (including-LOA)	224.0	5.3	24.8	193.9	114.2	102.8	7.0	4.0	8.0	6.8	0.0	188.8	15.5
	Vacancy rate (including-LOA) %	**9.2%**	**3.6%**	**7.2%**	**10.0%**	**8.3%**	**10.3%**	**10.4%**	**5.4%**	**3.1%**	**4.2%**	**0%**	**11.2%**	**6.9%**

Base: All respondents with full-time equivalent (FTE) positions >0 for the corresponding job categories
LOA = leave of absence; n/a = not applicable. In some cases sums vary due to decimals and rounding

Pharmacy Staffing Ratios

Table D-2, which details staffing ratios in terms of budgeted hours per patient day, will be useful for pharmacy directors and managers who want to compare their staffing allocations with those of other similar-sized hospitals or justify to hospital administrators the staffing requirements for new services. In this report, average ratios are provided for all hospitals combined, for teaching vs. non-teaching hospitals, for hospitals of different bed sizes and for hospitals within each region. The numerator in each ratio is the number of hours of staff time that a pharmacy department has at its disposal to provide pharmacy services (budgeted hours), and the denominator is the total number of patient days.

The number of patient days is a measure widely used to assess and compare workload and resource allocation not only for pharmacy, but also for most departments within the healthcare system, making it a proxy for workload that is universally accepted by healthcare executives. In the context of hospital pharmacy, the number of patient days is an imperfect proxy for workload, but experience has shown that results expressed in these terms have a high degree of consistency and reproducibility, even when all types of patient days are grouped in the denominator.

The 2023/24 survey collected data for program-specific staffing ratios (e.g., critical care patient days, oncology patient days and medicine patient days), as presented in E - Benchmarking. Here, staffing ratios are reported for the hospital as a whole. Four distinct ratios have been calculated, to account for the composition of different hospitals in terms of acute care and non-acute care beds, and to account for the important investment of resources in ambulatory/outpatient programs that are offered in most hospitals.

Inpatient budgeted hours per acute patient day: Relative to total budgeted hours, this ratio affords a more accurate view of resources used specifically for inpatient-related acute care beds by excluding from the numerator budgeted hours allotted for ambulatory care and non-acute care, as well as excluding from the denominator patient days for non-acute care beds.

Inpatient budgeted hours per total (acute + non-acute) patient day: This ratio excludes from the numerator the hours devoted to providing ambulatory care services. However, as for the final ratio described below, caution should be used, because important variations exist when the proportion of acute care beds is considered.

Total (inpatient + outpatient) budgeted hours per acute patient day: This ratio excludes from the denominator patient days for non-acute care beds, such as long-term care beds, but it includes in the numerator budgeted hours allotted for non-acute care beds and for ambulatory care services.

Total (inpatient + outpatient) budgeted hours per total (acute + non-acute) patient day: This ratio is all-inclusive and should be used with caution by pharmacy managers, as there are important variations when the proportion of acute care beds is considered.

Table D-2 Staffing Ratios – Budgeted Hours per Patient Day, 2023/24

Ratio		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Inpatient budgeted hours per acute patient day	(n=)	(145)	(51)	(49)	(45)	(48)	(91)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**1.08**	**1.10**	**1.15**	**1.00**	**1.06**	**1.00**	**2.46**	**1.01**	**1.01**	**0.89**	**1.10**	**1.14**	**1.29**
Inpatient budgeted hours per total (acute + non-acute) patient day	(n=)	(145)	(51)	(49)	(45)	(48)	(91)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**0.86**	**0.94**	**0.96**	**0.65**	**0.86**	**0.76**	**2.38**	**0.79**	**0.98**	**0.82**	**0.86**	**0.67**	**1.04**
Total (inpatient + outpatient) budgeted hours per acute patient day	(n=)	(145)	(51)	(49)	(45)	(48)	(91)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**1.24**	**1.24**	**1.28**	**1.21**	**1.25**	**1.14**	**2.75**	**1.11**	**1.13**	**1.01**	**1.23**	**1.42**	**1.50**
Total (inpatient + outpatient) budgeted hours per total (acute + non-acute) patient day	(n=)	(145)	(51)	(49)	(45)	(48)	(91)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**0.98**	**1.06**	**1.08**	**0.77**	**1.00**	**0.86**	**2.67**	**0.87**	**1.10**	**0.92**	**0.96**	**0.81**	**1.22**

Base: All respondents who provided staffing and patient days information, n = 145

- Pediatric hospitals continued to have the highest average values for all staffing ratios.
- Teaching hospitals continued to have higher total budgeted hours per acute patient day than non-teaching hospitals.
- Regionally, QC and ATL had the highest ratios for inpatient budgeted hours per acute patient days. However, when both acute and non-acute patient days were included, QC had the lowest ratios, while ATL remained above the Canadian averages. These findings are consistent with results in 2020/21.
- It should be noted that QC respondents reported a high number of non-acute patient days. In this regard, Chapter A - Demographics shows that QC had a disproportionately high number of non-acute care beds (23,722) relative to other regions, such as ON (3,898) and BC (2,627).
- Trends for these ratios from 2007/08 to 2023/24 are shown in **Table D-3**.

Overall, most staffing ratios have increased since 2007/08, indicating steady, continued growth in Canadian hospital pharmacy departments over the past 16 years. However, we see a slight decrease in ratios when only acute patient days are considered in 2023/24 compared to 2020/21. This observation is possibly related to the bed management practices that occurred in acute care hospitals during the COVID-19 pandemic.

Table D-3 Staffing Ratios – Trends from 2007/08 to 2023/24

Ratio		2023/24	2020/21	2016/17	2013/14	2011/12	2009/10	2007/08
Inpatient budgeted hours per acute patient day	(n=)	(145)	(135)	(166)	(149)	(148)	n/a	n/a
	Average	**1.08**	**1.11**	**0.89**	**0.86**	**0.80**	**n/a**	**n/a**
Inpatient budgeted hours per total (acute + non-acute) patient day	(n=)	(145)	(135)	(161)	(142)	(143)	(149)	n/a
	Average	**0.86**	**0.82**	**0.70**	**0.62**	**0.58**	**0.62**	**n/a**
Total (inpatient + outpatient) budgeted hours per acute patient day	(n=)	(145)	(135)	(166)	(149)	(148)	(154)	(144)
	Average	**1.24**	**1.27**	**0.99**	**0.95**	**0.87**	**0.87**	**0.85**
Total (inpatient + outpatient) budgeted hours per total (acute + non-acute) patient day	(n=)	(145)	(135)	(161)	(142)	(143)	(149)	(139)
	Average	**0.98**	**0.92**	**0.77**	**0.68**	**0.64**	**0.68**	**0.63**

Base: Base: All respondents who provided information on staffing and patient days
Note: Data represent the total number of hospitals (including pediatric facilities)
n/a = not applicable (data not reported for designated survey year)

Staff Composition of the Typical Hospital Pharmacy Department

To allow pharmacy directors to compare the staff composition of their respective departments with that of other comparable hospitals, this report includes data on the different types of staff that facilities employ **(Table D-4).** This information will be useful for examining and comparing staff composition among different regions, between teaching and non-teaching hospitals, and among hospitals of different bed sizes. Overall, respondents reported an increase in staffing of pharmacists and technical staff:

- Average of 21.1 FTE staff pharmacists in 2023/24, compared to 16.9 FTE in 2020/21.
- Average of 14.6 FTE advanced practice pharmacists, compared to 11.5 FTE in 2020/21.
- Average of 29.0 FTE staff pharmacists and advanced practice pharmacists combined, compared to 22.6 FTE in 2020/21.

- QC continues to be the only region where the average number of advanced practice pharmacists is greater than the number of staff pharmacists. This can be attributed to the Master of Science (MSc) advanced pharmacotherapy program offered by both faculties of pharmacy in QC and expected for pharmacists working in hospitals.
- Average of 21.8 FTE pharmacy technicians, compared to 21.5 FTE in 2020/21.
- Average of 25.5 FTE pharmacy assistants, compared to 20.8 FTE in 2020/21.
- The average number of pharmacy technicians was highest in ON, with 43.3 FTEs.
- Overall average FTEs for managers of all types were difficult to interpret, as averages, medians and maximums varied greatly across regions and hospital types, perhaps demonstrating a lack of uniformity in the administrative structure of pharmacy departments.
- Interestingly, the ratio of pharmacy technician FTEs to pharmacy assistant FTEs (not shown in **Table D-4)** was highly variable from one region to another. In ON, this ratio was 10:1 (43.3/4.1); in BC, it was 4:1 (21.2/5.3); in AB, it was 3:2 (21.3/14.3); while in ATL and SK/MB, it was 1:1 (14.5/14.9 and 8.8/9, respectively). This wide variation may reflect differences among the provinces in the availability of pharmacy technicians, their assigned responsibilities and work organization, or budgetary constraints.

Table D-4 Average Budgeted Pharmacy Staffing (Full-Time Equivalents), 2023/24

Position		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Staff pharmacist	(n=)	(140)	(49)	(47)	(44)	(44)	(91)	(5)	(28)	(18)	(20)	(32)	(16)	(26)
		21.1	**7.6**	**21.8**	**35.5**	**34.0**	**14.8**	**23.9**	**13.1**	**27.5**	**15.3**	**37.0**	**10.5**	**17.0**
Advanced practice pharmacist	(n=)	(89)	(12)	(37)	(40)	(35)	(50)	(4)	(23)	(6)	(7)	(18)	(23)	(12)
		14.6	**2.5**	**5.4**	**26.7**	**20.4**	**10.6**	**13.7**	**8.5**	**6.1**	**2.4**	**3.8**	**41.5**	**2.2**
Total pharmacists (staff and advanced practice)	(n=)	(147)	(50)	(49)	(48)	(48)	(93)	(6)	(28)	(18)	(20)	(32)	(23)	(26)
		29.0	**8.1**	**25.0**	**54.8**	**46.0**	**20.2**	**29.0**	**20.0**	**29.6**	**16.1**	**39.1**	**48.8**	**18.0**
Pharmacist manager	(n=)	(136)	(44)	(44)	(48)	(48)	(82)	(6)	(27)	(16)	(19)	(27)	(23)	(24)
		2.3	**0.9**	**1.5**	**4.3**	**3.2**	**1.8**	**2.1**	**1.7**	**1.3**	**1.2**	**2.4**	**5.6**	**1.4**
Pharmacy manager	(n=)	(31)	(5)	(8)	(18)	(12)	(18)	(1)	(3)	(6)	(1)	(5)	(14)	(2)
		1.3	**0.6**	**1.1**	**1.6**	**1.9**	**1.0**	**1.0**	**0.3**	**0.4**	**1.0**	**0.9**	**2.1**	**1.0**
Pharmacy technician manager	(n=)	(75)	(22)	(32)	(21)	(26)	(47)	(2)	(20)	(17)	(8)	(17)	(1)	(12)
		1.2	**0.8**	**1.1**	**1.6**	**1.5**	**1.0**	**1.0**	**1.3**	**1.0**	**1.6**	**1.1**	**0.0**	**1.1**

Table D-4 Average Budgeted Pharmacy Staffing (Full-Time Equivalents), 2023/24 (Continued)

Position		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacy assistant manager	(n=)	(23)	(3)	(7)	(13)	(10)	(13)	(0)	(5)	(7)	(0)	(2)	(4)	(5)
		0.8	**0.3**	**1.1**	**0.8**	**1.3**	**0.5**	**n/a**	**0.7**	**0.6**	**n/a**	**1.0**	**1.2**	**1.0**
Pharmacy technician	(n=)	(133)	(48)	(46)	(39)	(43)	(85)	(5)	(27)	(18)	(19)	(31)	(12)	(26)
		21.8	**9.6**	**22.0**	**36.7**	**30.9**	**17.0**	**25.8**	**21.2**	**21.3**	**8.8**	**43.3**	**5.2**	**14.5**
Pharmacy assistant	(n=)	(95)	(28)	(30)	(37)	(33)	(58)	(4)	(14)	(18)	(18)	(7)	(23)	(15)
		25.5	**5.2**	**11.4**	**52.3**	**41.2**	**17.2**	**16.8**	**5.3**	**14.3**	**9.0**	**4.1**	**73.0**	**14.9**
Non-pharmacy personnel	(n=)	(82)	(11)	(30)	(41)	(44)	(34)	(4)	(8)	(14)	(5)	(18)	(21)	(16)
		2.8	**0.8**	**1.4**	**4.4**	**3.5**	**2.1**	**1.8**	**1.5**	**1.4**	**2.4**	**2.7**	**5.7**	**1.3**

Base: All respondents who provided staffing information; see Appendix IV - Definitions for descriptions of the pharmacy staffing positions shown in the table. n/a = not applicable

Staffing Relative to Bed Numbers (FTEs per 100 Acute Care Beds)

This year, a new ratio has been calculated for various pharmacy staff positions: FTEs per 100 acute care beds **(Table D-5)**. These data are intended to give pharmacy directors a way to compare their staffing levels with those of other similar Canadian institutions, according to the number of acute care beds, when more accurate metrics (such as worked hours or budgeted hours per patient days) are not readily available. Given that these ratios are based on the number of acute care beds reported, and given that they do not take into account the occupancy rate of each individual institution, directors and managers are advised to exercise caution when using them for benchmarking purposes. For 2023/24, the overall average occupancy rate for acute care beds in Canada was 94%, with some notable differences among provinces (see A - Demographics, **Table A-2**).

- Across Canada, the average ratio for all pharmacists (staff + advanced practice + pharmacist managers), combining inpatient and outpatient FTEs, was 9.1 FTEs per 100 beds.
- By hospital type, pediatric facilities had the highest average ratio for all pharmacists, combining inpatient and outpatient FTEs, with 15.9 FTEs per 100 beds.
- Regionally, the highest average ratio for all pharmacists, combining inpatient and outpatient FTEs, was 11.1 FTEs per 100 beds in ATL.
- Across Canada, the average ratio for technical staff (pharmacy technicians and pharmacy assistants), combining inpatient and outpatient FTEs, was 11.2 FTEs per 100 beds.
- By hospital type, pediatric facilities had the highest average ratio for all technical staff, combining inpatient and outpatient FTEs, with 17.3 FTEs per 100 beds.
- Regionally, the highest average ratio for technical staff, combining inpatient and outpatient FTEs, was 13.9 FTEs per 100 beds in ATL.

- Across the country, for all pharmacy staff combined and accounting for both inpatient and outpatient FTEs, the average ratio was 20.7 FTEs per 100 beds.
- By hospital type, pediatric facilities had the highest average ratio for all pharmacy staff combined, accounting for both inpatient and outpatient FTEs, with 33.9 FTEs per 100 beds.
- Regionally, the highest average ratio for all pharmacy staff combined, accounting for both inpatient and outpatient FTEs, was 26.1 FTEs per 100 beds in ATL.

Table D-5 Ratios of Pharmacy Staff Full-Time Equivalents (FTEs) per 100 Acute Care Beds, 2023/24

Pharmacy Staff (AVERAGE) FTEs per 100 acute care bed ratio	Patient Population	All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
All Pharmacists (Staff +Advanced +Pharmacist Managers)	(n=)	(148)	(51)	(49)	(48)	(48)	(94)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
	Inpatient + Outpatient	9.1	8.8	9.5	9.0	9.8	8.3	15.9	8.6	8.3	7.7	9.3	8.8	11.1
	Inpatient ONLY	7.7	7.6	8.2	7.2	8.1	7.1	13.5	7.8	6.9	6.6	8.0	6.7	9.4
Pharmacists (Staff+Advanced only)	(n=)	(147)	(50)	(49)	(48)	(48)	(93)	(6)	(28)	(18)	(20)	(32)	(23)	(26)
	Inpatient + Outpatient	8.4	8.0	9.0	8.3	9.2	7.6	14.8	7.8	7.9	6.9	9.1	7.9	10.4
	Inpatient ONLY	7.1	6.9	7.7	6.6	7.5	6.5	12.7	7.0	6.5	5.8	7.8	6.0	8.6
Pharmacy technicians	(n=)	(133)	(48)	(46)	(39)	(43)	(85)	(5)	(27)	(18)	(19)	(31)	(12)	(26)
	Inpatient + Outpatient	8.1	9.7	8.4	5.8	7.6	7.9	15.6	9.9	6.5	4.2	11.1	1.0	9.7
	Inpatient ONLY	7.3	8.6	7.9	5.2	6.8	7.2	13.9	9.2	6.0	3.8	10.2	0.8	8.5
Pharmacy assistants	(n=)	(95)	(28)	(30)	(37)	(33)	(58)	(4)	(14)	(18)	(18)	(7)	(23)	(15)
	Inpatient + Outpatient	5.8	5.0	4.1	7.7	6.5	5.3	6.5	1.3	4.0	4.3	0.8	11.6	12.2
	Inpatient ONLY	5.1	4.7	3.7	6.4	5.7	4.6	6.4	1.3	4.0	3.8	0.8	9.5	6.5
Pharmacy technicians + pharmacy assistants combined	(n=)	(145)	(50)	(48)	(47)	(47)	(92)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Inpatient + Outpatient	11.2	12.1	10.6	10.8	11.5	10.6	17.3	10.6	10.5	7.8	11.2	12.2	13.9
	Inpatient ONLY	10.0	10.8	9.9	9.3	10.2	9.6	15.9	9.8	10.0	7.1	10.4	9.9	12.2
Pharmacy technician managers and Pharmacy assistant managers	(n=)	(80)	(22)	(33)	(25)	(28)	(50)	(2)	(22)	(17)	(8)	(17)	(4)	(12)
	Inpatient + Outpatient	0.5	0.9	0.5	0.3	0.4	0.6	0.6	0.7	0.4	0.5	0.3	0.1	0.8
	(n=)	(79)	(21)	(33)	(25)	(28)	(49)	(2)	(22)	(16)	(8)	(17)	(4)	(12)
	Inpatient ONLY	0.5	0.8	0.5	0.3	0.4	0.6	0.6	0.7	0.4	0.4	0.3	0.1	0.7
All Pharmacy Staff combined	(n=)	(148)	(51)	(49)	(48)	(48)	(94)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
	Inpatient + Outpatient	20.7	21.2	20.7	20.3	21.9	19.3	33.9	19.5	19.5	15.9	20.3	22.0	26.1
	Inpatient ONLY	18.1	18.8	18.5	16.9	18.8	17.0	30.1	17.9	17.5	14.1	18.2	17.5	22.4

Base: respondents providing FTE and acute care bed statistics; see Appendix IV - Definitions for the pharmacy staffing positions shown in the table
Note: Calculations were made using the number of acute care beds reported, not the occupancy rate

For all categories of pharmacy staff, pediatric facilities and the Atlantic region had the highest numbers of full-time equivalents (FTEs) per 100 acute care beds (for inpatient and outpatient FTEs combined).

Ratios of Pharmacy Technical Staff to Pharmacists

Table D-6 shows data for three staffing ratios: inpatient pharmacy technicians and pharmacy assistants to inpatient pharmacists (staff + advanced practice); outpatient pharmacy technicians and pharmacy assistants to outpatient pharmacists (staff + advanced practice); and inpatient and outpatient pharmacy technicians and pharmacy assistants to inpatient and outpatient pharmacists (staff + advanced practice),

- When only inpatient FTEs were considered, the average staffing ratio for pharmacy technical staff (pharmacy technicians and pharmacy assistants) to pharmacists was 1.51, lower than the 1.60 reported for 2020/21.
- The ratio of pharmacy technical staff to pharmacists based on inpatient staff remained higher in non-teaching hospitals than in teaching hospitals and pediatric hospitals (1.58 vs. 1.43 and 1.18, respectively). The lower ratios for teaching and pediatric hospitals may be due to higher numbers of clinical pharmacists and teaching/research pharmacists in these facilities, which would increase the total number of pharmacists, hence reducing the Technical staff/pharmacist ratio.
- Regionally, QC had the highest ratio of inpatient pharmacy technical staff to inpatient pharmacists (1.73), whereas SK/MB had the lowest ratio (1.27).
- When only outpatient FTEs were considered, BC was the region with the highest ratio of pharmacy technical staff to pharmacists (1.98), while AB had the lowest ratio (0.60).
- For combined inpatient and outpatient settings, QC and BC had the highest ratio of pharmacy technical staff to pharmacists (1.59 and 1.53, respectively), while SK/MB had the lowest ratio (1.21).

Table D-6 Ratios of Pharmacy Technicians and Pharmacy Assistants to Pharmacists, 2023/24

Ratio		All	Bed Size			Hospital Type			Region					
			50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Inpatient pharmacy technicians and pharmacy assistants to inpatient pharmacists (staff + advanced practice)	(n=)	(145)	(50)	(48)	(47)	(47)	(92)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**1.51**	**1.69**	**1.36**	**1.48**	**1.43**	**1.58**	**1.18**	**1.56**	**1.60**	**1.27**	**1.40**	**1.73**	**1.52**
Outpatient pharmacy technicians and pharmacy assistants to outpatient pharmacists (staff + advanced practice)	(n=)	(101)	(30)	(31)	(40)	(35)	(61)	(5)	(13)	(13)	(13)	(22)	(22)	(18)
	Average	**1.24**	**1.98**	**0.78**	**1.04**	**0.99**	**1.40**	**1.15**	**1.98**	**0.60**	**1.55**	**1.03**	**1.33**	**1.11**
Inpatient and outpatient pharmacy technicians and pharmacy assistants to inpatient and outpatient pharmacists (staff + advanced practice)	(n=)	(145)	(50)	(48)	(47)	(47)	(92)	(6)	(27)	(18)	(20)	(31)	(23)	(26)
	Average	**1.40**	**1.60**	**1.26**	**1.34**	**1.28**	**1.49**	**1.11**	**1.53**	**1.38**	**1.21**	**1.31**	**1.59**	**1.40**

Base: All respondents who provided staffing information

Salaries

Respondents were asked to report salaries offered to the various types of employees within their respective departments, as summarized in **Table D-7.**

The average starting and top salaries for staff pharmacists were similar across all types and sizes of hospitals. This was also the case for advanced practice pharmacists. However, there were some notable regional differences:

- The ATL region had substantially lower starting and top salaries for staff pharmacists, while AB and QC had the highest starting and top salaries.
- QC and SK/MB had the highest starting and top salaries for advanced practice pharmacists.

There remain substantial regional differences in starting and top salaries for staff pharmacists and advanced practice pharmacists.

- There were notable differences in starting and top salaries for pharmacy technicians and pharmacy assistants across all regions.
- Of note, AB had the highest pharmacy technician top salary, at $100,732 for level 2 or senior technicians, making it the first province with technical staff breaking the $100,000 mark.
- Most pharmacy directors (56%) received a salary of $160,000 or more. This proportion reached 83% in QC and 67% in ON **(Table D-8)**.

Table D-7 Average Annual Starting and Top Salaries by Position, by Hospital Size and Type, and by Region, 2023/24

Position	All	Bed Size			Hospital Type			Region					
		50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Staff pharmacist													
(n=)	(132)	(46)	(44)	(42)	(42)	(84)	(6)	(27)	(18)	(20)	(25)	(19)	(23)
Start $	$100,666	$ 99,784	$100,444	$101,951	$ 99,308	$101,097	$104,373	$ 98,799	$110,922	$100,853	$ 97,487	$109,019	$ 92,676
(n=)	(133)	(45)	(45)	(43)	(43)	(84)	(6)	(27)	(17)	(20)	(26)	(19)	(24)
Top $	$122,367	$117,892	$123,793	$125,832	$119,629	$123,849	$120,217	$125,520	$127,584	$122,049	$123,123	$136,298	$105,861
Advanced practice pharmacist													
(n=)	(88)	(15)	(32)	(41)	(33)	(51)	(4)	(20)	(7)	(9)	(18)	(24)	(10)
Start $	$109,561	$109,279	$105,975	$112,222	$110,093	$109,865	$100,473	$104,101	n/a	$112,147	$104,942	$118,160	$105,057
(n=)	(89)	(15)	(33)	(41)	(34)	(51)	(4)	(20)	(7)	(9)	(18)	(24)	(11)
Top $	$132,567	$130,579	$129,580	$135,305	$131,793	$133,479	$128,450	$132,679	n/a	$136,279	$129,665	$138,781	$120,754
Practice leader / coordinator													
(n=)	(126)	(42)	(39)	(45)	(43)	(77)	(6)	(21)	(18)	(16)	(26)	(23)	(22)
Start $	$111,990	$108,434	$110,506	$114,947	$108,761	$113,249	$123,442	$112,826	$107,024	$113,412	$108,862	$126,414	$100,539
(n=)	(129)	(42)	(41)	(46)	(44)	(79)	(6)	(21)	(18)	(16)	(27)	(24)	(23)
Top $	$135,583	$128,717	$136,003	$138,803	$128,424	$139,546	$144,289	$152,083	$140,535	$133,744	$133,174	$144,665	$114,111
Pharmacy supervisor / coordinator													
(n=)	(115)	(37)	(36)	(42)	(38)	(71)	(6)	(17)	(16)	(12)	(28)	(24)	(18)
Start $	$126,913	$ 93,805	$106,967	$112,718	$106,355	$104,934	$103,672	$105,372	n/a	$107,744	$109,362	$131,207	$ 86,819
(n=)	(117)	(37)	(37)	(43)	(39)	(72)	(6)	(17)	(16)	(12)	(29)	(24)	(19)
Top $	$128,375	$116,134	$125,080	$133,516	$126,250	$130,066	$128,268	$131,226	n/a	$137,800	$158,006	$156,077	$103,642
Pharmacist manager													
(n=)	(124)	(41)	(38)	(45)	(42)	(76)	(6)	(25)	(14)	(20)	(22)	(22)	(21)
Start $	$117,851	$115,871	$116,614	$120,711	$114,685	$120,473	$108,996	$122,082	$109,531	$121,925	$116,807	$129,862	$103,514
(n=)	(132)	(44)	(41)	(47)	(46)	(80)	(6)	(25)	(17)	(20)	(23)	(24)	(23)
Top $	$145,066	$140,630	$142,505	$151,484	$142,843	$146,577	$143,233	$155,058	$149,410	$140,185	$141,660	$160,074	$123,903
Pharmacy manager													
(n=)	(38)	(7)	(15)	(16)	(11)	(25)	(2)	(3)	(7)	(2)	(8)	(15)	(3)
Start $	$ 83,861	$ 87,804	$ 91,490	$ 78,747	$ 78,983	$ 87,210	$ 83,000	n/a	$ 99,140	n/a	$125,054	$ 79,110	$ 61,164
(n=)	(38)	(7)	(15)	(16)	(11)	(25)	(2)	(3)	(7)	(2)	(8)	(15)	(3)
Top $	$110,292	$108,101	$121,038	$104,810	$106,324	$112,637	$113,000	n/a	$148,657	n/a	$140,201	$105,301	$ 88,653

Table D-7 Average Annual Starting and Top Salaries by Position, by Hospital Size and Type, and by Region, 2023/24 (Continued)

Position	All	Bed Size			Hospital Type			Region					
		50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Pharmacy technician manager													
(n=)	(70)	(21)	(28)	(21)	(25)	(43)	(2)	(16)	(14)	(9)	(17)	(3)	(11)
Start $	$ 78,473	$ 75,856	$ 76,045	$ 84,919	$ 77,728	$ 79,611	$ 66,965	$ 71,471	$ 83,938	$ 60,780	$104,882	n/a	$ 72,327
(n=)	(70)	(21)	(30)	(19)	(27)	(41)	(2)	(14)	(16)	(9)	(17)	(3)	(11)
Top $	$ 96,427	$ 84,645	$ 94,735	$115,316	$100,826	$ 93,008	$100,545	$ 73,878	$120,039	$ 76,111	$127,540	n/a	$ 78,050
Pharmacy assistant manager													
(n=)	(30)	(5)	(10)	(15)	(12)	(17)	(1)	(4)	(9)	(1)	(5)	(6)	(5)
Start $	$ 73,200	$ 55,846	$ 85,736	$ 61,868	$ 71,313	$ 76,030	n/a	$124,560	$ 78,620	n/a	n/a	$ 46,796	$ 55,846
(n=)	(30)	(5)	(10)	(15)	(12)	(17)	(1)	(4)	(9)	(1)	(5)	(6)	(5)
Top $	$101,645	$ 59,587	$119,019	$ 90,443	$ 97,382	$108,039	n/a	$162,936	$124,190	n/a	n/a	$ 53,802	$ 59,587
Pharmacy technician (level 1 or staff)													
(n=)	(124)	(45)	(42)	(37)	(41)	(78)	(5)	(27)	(18)	(19)	(23)	(13)	(24)
Start $	$ 60,428	$ 60,202	$ 61,398	$ 59,554	$ 58,462	$ 61,188	$ 64,445	$ 66,149	$ 63,195	$ 59,862	$ 63,709	$ 53,368	$ 52,455
(n=)	(119)	(43)	(41)	(35)	(41)	(73)	(5)	(22)	(17)	(19)	(24)	(13)	(24)
Top $	$ 68,514	$ 66,105	$ 68,029	$ 72,254	$ 68,289	$ 68,498	$ 70,537	$ 66,906	$ 79,103	$ 65,373	$ 73,032	$ 73,974	$ 57,951
Pharmacy technician (level 2 or senior)													
(n=)	(110)	(38)	(39)	(33)	(36)	(69)	(5)	(18)	(16)	(15)	(28)	(12)	(21)
Start $	$ 65,897	$ 67,146	$ 67,028	$ 62,157	$ 59,194	$ 68,137	$ 72,538	$ 65,870	$ 78,563	$ 72,567	$ 69,687	$ 50,000	$ 57,578
(n=)	(109)	(38)	(39)	(32)	(36)	(68)	(5)	(17)	(16)	(15)	(28)	(12)	(21)
Top $	$ 72,725	$ 71,066	$ 74,415	$ 71,755	$ 68,048	$ 74,623	$ 74,304	$ 65,674	$100,732	$ 76,809	$ 80,642	$ 70,000	$ 63,424
Pharmacy assistant (level 1 or staff)													
(n=)	(99)	(32)	(30)	(37)	(36)	(59)	(4)	(16)	(18)	(18)	(7)	(23)	(17)
Start $	$ 48,950	$ 47,125	$ 50,928	$ 49,066	$ 47,697	$ 49,666	$ 49,081	$ 54,295	$ 45,932	$ 46,684	$ 58,273	$ 48,431	$ 46,919
(n=)	(95)	(31)	(30)	(34)	(35)	(56)	(4)	(13)	(17)	(18)	(7)	(24)	(16)
Top $	$ 54,026	$ 53,450	$ 55,483	$ 53,212	$ 53,071	$ 54,596	$ 53,953	$ 54,801	$ 52,726	$ 53,542	$ 67,158	$ 52,031	$ 52,861
Pharmacy assistant (level 2 or senior)													
(n=)	(83)	(23)	(26)	(34)	(32)	(47)	(4)	(8)	(17)	(12)	(8)	(24)	(14)
Start $	$ 50,178	$ 54,840	$ 50,071	$ 49,321	$ 49,645	$ 50,968	$ 45,000	$ 44,294	n/a	$ 59,631	n/a	$ 49,331	$ 51,579
(n=)	(83)	(23)	(26)	(34)	(32)	(47)	(4)	(8)	(17)	(12)	(8)	(24)	(14)
Top $	$ 56,662	$ 59,834	$ 55,396	$ 56,419	$ 56,097	$ 57,450	$ 51,950	$ 45,440	n/a	$ 65,418	n/a	$ 57,211	$ 55,797

Base: All respondents who provided salary information
Note: Average starting and top salaries are shown for all staff combinations and all categories of hospitals, including those based on n < 10; n/a = not applicable

Table D-8 Pharmacy Director Annual Salary Ranges (Including Premiums), by Hospital Size and Type and by Region, 2023/24

Salary Range	All	Bed Size			Hospital Type			Region					
		50–200	201–500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n =)	(142)	(50)	(47)	(45)	(45)	(91)	(6)	(25)	(18)	(20)	(30)	(24)	(25)
$110,000–$119,999	3%	6%	2%		2%	3%				5%			12%
$120,000–$129,999	6%	10%	6%	2%	7%	7%					3%		32%
$130,000–$139,999	11%	22%	9%		13%	9%	17%			5%	10%	4%	40%
$140,000–$149,999	9%	8%	19%		13%	7%	17%	4%	11%	20%	10%	4%	8%
$150,000–$159,999	15%	18%	17%	9%		22%	17%	44%		15%	10%	8%	8%
$160,000–$169,999	28%	28%	34%	22%	27%	29%	33%	36%	89%	45%	20%		
≥ $170,000	28%	8%	13%	67%	38%	24%	17%	16%		10%	47%	83%	
$170,000–$179,999	8%	4%	6%	16%	9%	8%		4%		10%	13%	21%	
$180,000–$189,999	6%		2%	16%	4%	7%					10%	21%	
$190,000–$199,999	6%	2%	2%	13%	9%	4%		4%			7%	21%	
≥ $200,000	8%	2%	2%	22%	16%	5%		8%			17%	21%	

Base: All respondents, n = 142
Note: Percentages are calculated relative to the n value at top of each column (including for pediatric facilities, where n < 10); percentages in each column may not sum to exactly 100% because of rounding

Conclusion

The results of the 2023/24 CSHP Hospital Pharmacy in Canada Survey indicate that vacancy rates for pharmacists and pharmacy technicians have increased since 2020/21. Nonetheless, overall, most pharmacy staffing ratios per patient day have continued to increase for all categories of staff, indicating continued growth in pharmacy departments. There is considerable variation among regions in terms of staff mix, notably in the proportion of advanced practice pharmacists on staff and the ratios of pharmacy technicians to pharmacy assistants. Salaries for all categories of staff in pharmacy departments have continued to increase.

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E - Benchmarking

Hélène Paradis and Sammu Dhaliwall

Benchmarking is a critical process in hospital pharmacy in Canada, enabling pharmacy leaders to assess service delivery and resource utilization relative to national peers. By analyzing key indicators—such as staffing ratios, drug expenditures, and paid hours—benchmarking supports evidence-informed decision making, workforce planning and quality improvement initiatives aimed at optimizing care.

The CSHP Hospital Pharmacy in Canada Survey Report is a key resource for benchmarking. Since 1997/98, the report has included a dedicated section on benchmarking, which has evolved to reflect increasingly granular metrics, such as staffing ratios per bed, per patient day and per admission across various clinical services and programs, as well as drug costs associated with pharmacy services for specific patient care programs. The survey data are collected from a wide range of hospitals, including both teaching and non-teaching facilities, and cover various aspects of pharmacy practice and clinical and non-clinical responsibilities.

As in the 2020/21 report, this report for 2023/24 focuses on paid hours rather than budgeted hours, to more accurately represent staffing levels by accounting for absenteeism, vacancies and workload variability. This shift in reporting enables more meaningful benchmarking, particularly in the context of rising acuity and evolving service models.

Staffing ratios and drug costs can vary across different regions and types of hospitals. For example, the average number of acute care beds per respondent and the corresponding staffing levels may vary significantly, highlighting the need for tailored benchmarking approaches. Published data are limited, and this report can thus provide helpful data for workforce planning and can serve as a valuable tool offering detailed insights and data for effective benchmarking.

Survey respondents were asked to provide drug costs for all drugs associated with inpatient and outpatient services, regardless of the source of funding, including oncology drugs, anesthetic gases, parenteral nutrition solutions and lipids, and any inpatient drugs, including those for which costs may be recovered from outside agencies. Conversely, the costs of intravenous solutions (e.g., normal saline, 5% dextrose in water [D5W]), continuous bladder irrigation solutions, dialysis solutions, contrast media and bulk gases (e.g., oxygen, nitric oxide) were to be excluded.

The following caveat applies to all tables in this chapter and should be considered when they are used for benchmarking by individual institutions:

- By deliberate choice, regional ratios are not presented, given the small number of responses per region for most of the ratios. However, the text includes some commentary in cases where regional differences were notable.

Inpatient Services/Programs Paid Hours

Pharmacist staffing per bed has declined across programs since the 2020/21 survey. This could be partly driven by a 19% increase in total reported beds, which highlights the need to interpret national medians in the context of hospital mix and overall workforce trends.

Table E-1 presents the estimated annual paid hours (not budgeted hours), relative to numbers of inpatient beds, inpatient days and inpatient admissions, for pharmacy staff for both clinical and non-clinical activities combined.

- As in 2020/21, the following patient programs were still demanding the most pharmacist hours per inpatient bed (although bone marrow transplant had the highest number of paid hours per inpatient bed in 2020/21, data for this program are not reported for 2023/24 because the number of respondents was less than 5):
  - Adult critical care: 139.1 in 2023/24 vs 156.0 in 2020/21
  - Oncology: 159.1 in 2023/24 vs 117.7 in 2020/21
- The median number of pharmacist hours per patient day stayed fairly consistent since 2020/21, with most programs showing only modest declines. Adult critical care still had the highest ratio, at 0.5.
- The majority of respondents from British Columbia and the Atlantic provinces (ATL, consisting of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador) were unable to provide a breakdown for the various patient care programs.
- On average, only 7% (see **Figure E-1**) of pharmacy technician or pharmacy assistant hours were spent on clinical services, despite the expansion of pharmacy technicians' scope of practice in most provinces.
- In terms of total paid hours for inpatient services/programs **(Figure E-2)**, the largest proportion was for drug distribution activities performed by pharmacy technicians and/or pharmacy assistants (50.8%), followed by decentralized clinical services performed by pharmacists (23.9%).
- In terms of total paid hours for outpatient services/programs **(Figure E-3)**, the largest proportion was for decentralized clinical services performed by pharmacists (39.0%), followed by drug distribution activities performed by pharmacy technicians and/or pharmacy assistants (34.5%).

Table E-1 Inpatient Paid Hours per Inpatient Bed, per Patient Day and per Inpatient Admission, 2023/24

Ratio	Statistics	Patient Care Programs										
		Adult Critical Care	Pediatric Critical Care	Medicine	Surgery	Pediat-rics	Oncology	Bone Marrow Transplant	Obstetrics / Gynecol-ogy	Long-Term Care	Rehabil-itation	Other
Pharmacist paid hours per inpatient bed	(n=)	(32)	(18)	(35)	(31)	(17)	(7)	(<5)	(19)	(12)	(15)	(20)
	10%ile	76.2	30.1	28.7	36.0	0.1		n/a	0.0	0.0	12.6	0.0
	Median	**139.1**	**90.5**	**69.6**	**68.0**	**64.6**	**159.1**	**n/a**	**37.5**	**9.1**	**37.5**	**46.8**
	90%ile	281.9	200.4	123.3	109.4	198.8		n/a	116.5	39.0	90.8	29830.0
Pharmacy technician/ pharmacy assistant paid hours per inpatient bed	(n=)	(15)	(8)	(15)	(14)	(<5)	(<5)	(<5)	(10)	(5)	(8)	(6)
	10%ile	51.6		24.3	18.2	n/a	n/a	n/a	50.7			
	Median	**156.0**	**134.5**	**94.6**	**108.7**	**n/a**	**n/a**	**n/a**	**56.6**	**1.6**	**100.1**	**69.4**
	90%ile	772.3		160.1	179.3	n/a	n/a	n/a	230.3			
All paid hours per inpatient bed	(n=)	(32)	(18)	(35)	(31)	(17)	(7)	(<5)	(20)	(12)	(15)	(20)
	10%ile	93.2	30.1	28.7	36.0	0.3		n/a	56.0	0.0	20.6	156.0
	Median	**201.8**	**123.5**	**101.3**	**88.6**	**116.3**	**166.4**	**n/a**	**49.7**	**15.1**	**119.3**	**64.8**
	90%ile	572.3	706.8	270.6	234.8	390.0		n/a	2728.3	39.0	223.3	8533.6
Pharmacist paid hours per patient day	(n=)	(29)	(16)	(30)	(28)	(15)	(5)	(<5)	(18)	(8)	(12)	(20)
	10%ile	0.3	0.1	0.3	0.1	0.0		n/a	0.0		0.1	0.0
	Median	**0.5**	**0.3**	**0.2**	**0.2**	**0.3**	**0.4**	**n/a**	**0.2**	**0.0**	**0.1**	**0.2**
	90%ile	0.9	1.9	0.6	0.6	0.9		n/a	0.4		0.3	16.1
Pharmacy technician/ pharmacy assistant paid hours per patient day	(n=)	(15)	(8)	(14)	(13)	(<5)	(<5)	(<5)	(9)	(<5)	(7)	(6)
	10%ile	0.2		0.1	0.1	n/a	n/a	n/a		n/a		
	Median	**0.5**	**0.7**	**0.3**	**0.3**	**n/a**	**n/a**	**n/a**	**0.2**	**n/a**	**0.3**	**0.2**
	90%ile	1.9		0.5	0.6	n/a	n/a	n/a		n/a		
All paid hours per patient day	(n=)	(29)	(16)	(30)	(28)	(15)	(5)	(<5)	(18)	(8)	(12)	(20)
	10%ile	0.3	0.1	0.3	0.1	0.0		n/a	0.1		0.1	0.5
	Median	**0.8**	**0.4**	**0.3**	**0.3**	**0.4**	**0.5**	**n/a**	**0.2**	**0.1**	**0.4**	**0.3**
	90%ile	2.6	3.8	0.8	0.9	3.1		n/a	0.9		0.7	109.2
Pharmacist paid hours per inpatient admission	(n=)	(23)	(15)	(23)	(21)	(13)	(5)	(<5)	(15)	(5)	(10)	(15)
	10%ile	2.0	0.5	1.3	0.7	0.6		n/a	0.0		2.5	0.0
	Median	**4.8**	**4.9**	**2.8**	**1.4**	**1.9**	**6.4**	**n/a**	**0.3**	**8.0**	**4.5**	**3.7**
	90%ile	14.4	78.5	8.6	3	3.4		n/a	0.7		28.9	8.0
Pharmacy technician/ pharmacy assistant paid hours per inpatient admission	(n=)	(11)	(8)	(10)	(9)	(<5)	(<5)	(<5)	(7)	(<5)	(6)	(<5)
	10%ile	2.3		5.2		n/a	n/a	n/a		n/a		n/a
	Median	**5.3**	**4.5**	**4.6**	**3.6**	**n/a**	**n/a**	**n/a**	**0.6**	**n/a**	**14.2**	**n/a**
	90%ile	18.0		59.7		n/a	n/a	n/a		n/a		n/a
All paid hours per inpatient admission	(n=)	(23)	(15)	(23)	(21)	(13)	(5)	(<5)	(15)	(5)	(10)	(15)
	10%ile	3.7	1.2	1.8	0.7	0.6		n/a	0.2		2.5	0.8
	Median	**5.7**	**9.2**	**3.3**	**1.8**	**2.0**	**6.4**	**n/a**	**0.6**	**8.0**	**11.2**	**3.7**
	90%ile	30.0	167.2	24.4	8.4	7.5		n/a	1.7		76.1	29.3

Base: All respondents providing benchmarking data. Whenever the n value was less than 5, no data are reported; whenever the n value was between 5 and 9, only the median is reported, without percentiles. n/a = not applicablev

Figure E-1 All Paid Hours for Inpatient and Outpatient Services/Programs Combined, 2023/24

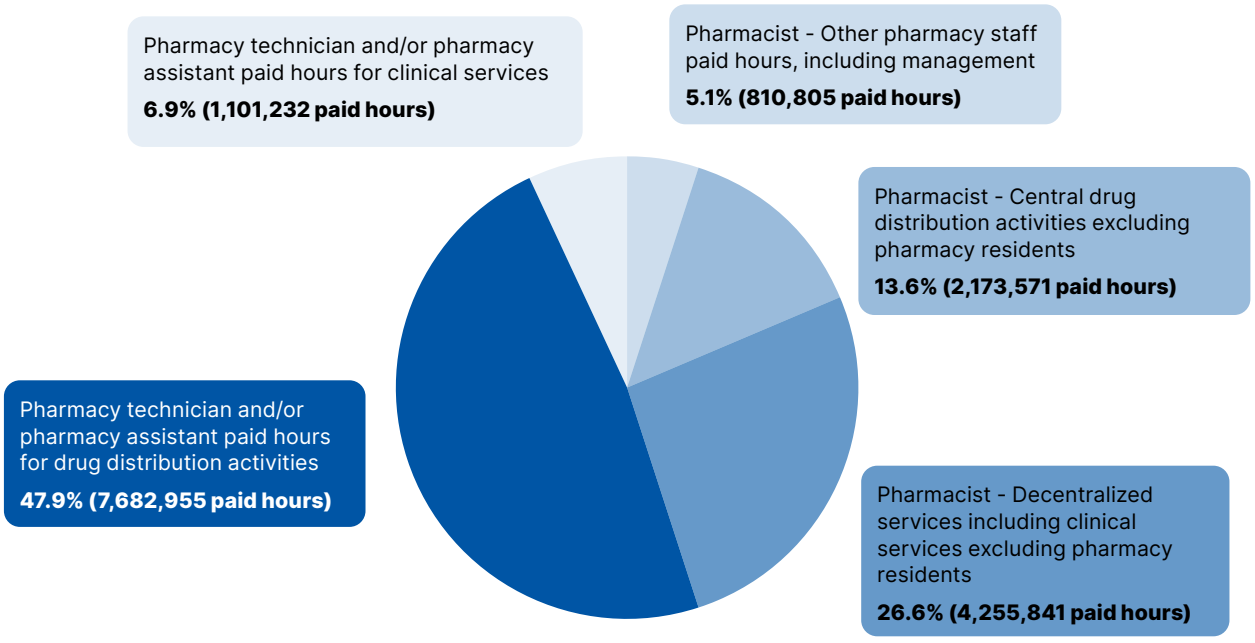


Figure E-2 Total Paid Hours for Inpatient Services/Programs, 2023/24

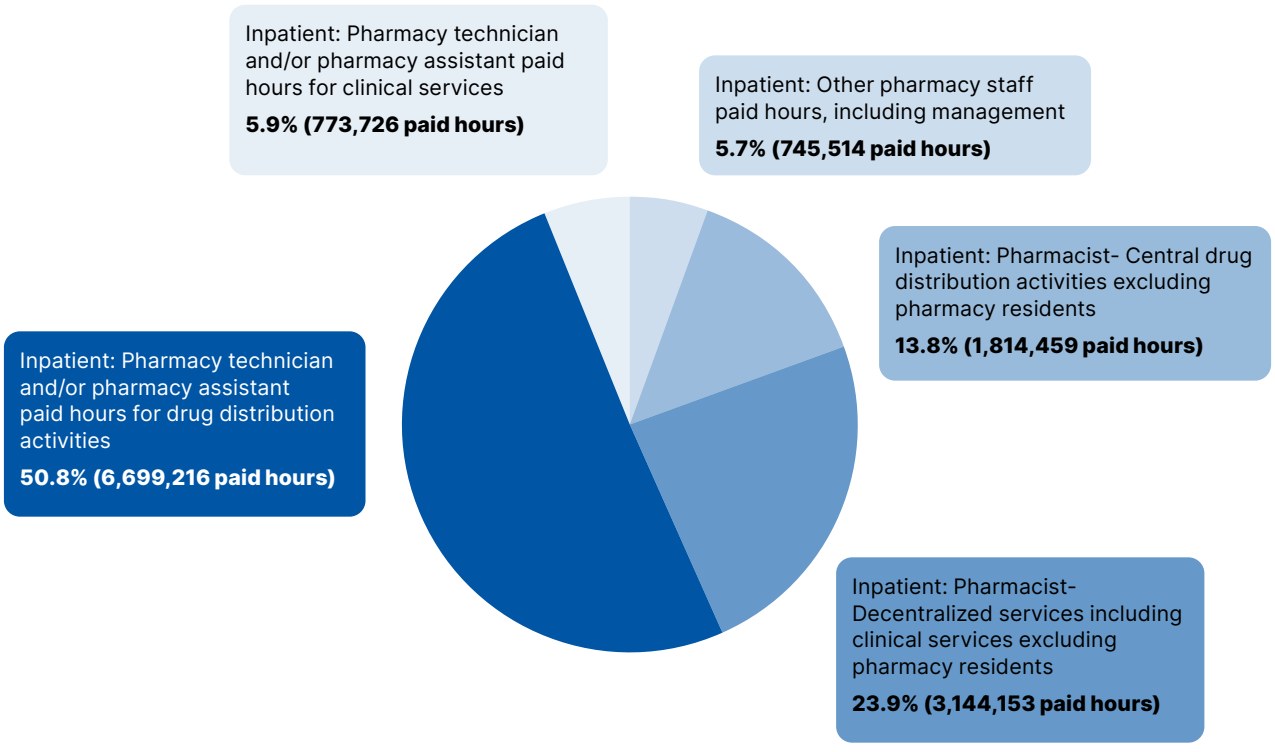
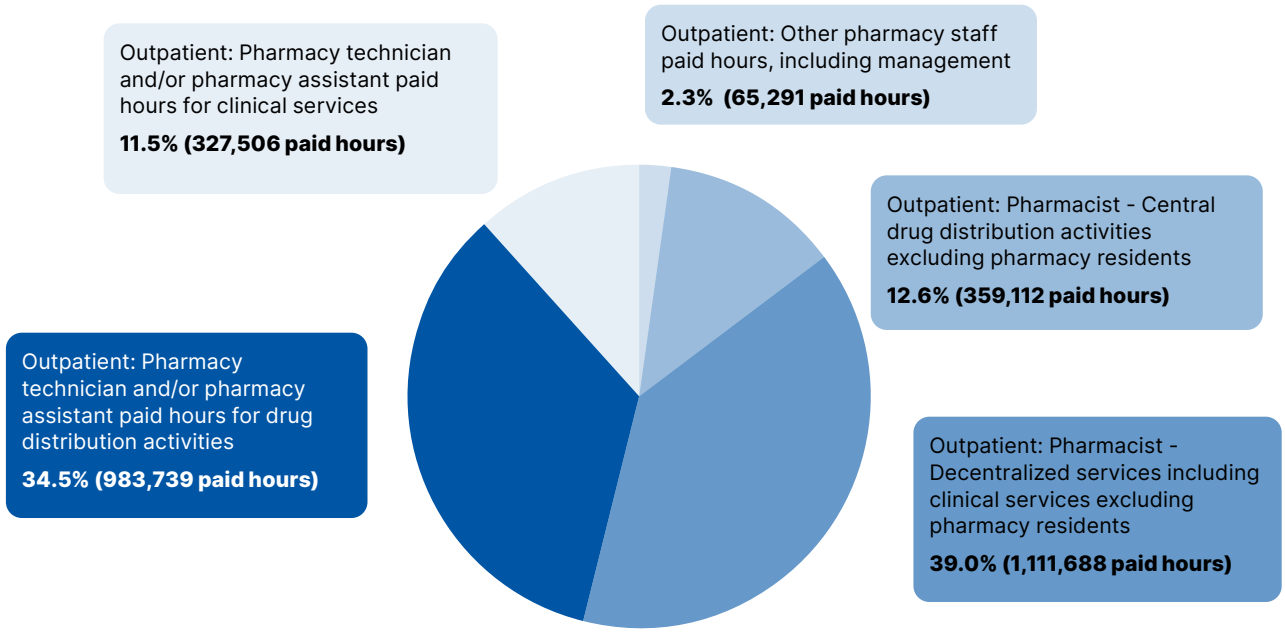


Figure E-3 Total Paid Hours for Outpatient Services/Programs, 2023/24



Paid Hours for Outpatient Services/Programs

Oncology continues to be the most resource-intensive program.

Table E-2 presents the paid hours per 100 outpatient visits by service/program and by pharmacy staff group.

- Overall, the median ratios for pharmacists' paid hours per 100 outpatient visits are very similar to those reported for 2020/21. The ratios were also similar for pharmacy technicians, pharmacy assistants and other pharmacy staff, including management.
- Only two respondents provided data on paid hours for other pharmacy staff, including management: one respondent from Québec for oncology only (with median 3.9 paid hours per 100 outpatient visits) and one respondent from the ATL region for various outpatient services/programs (with median 3.8 paid hours per 100 outpatient visits).

Pharmacy technicians and/or pharmacy assistants are primarily assigned to perform drug distribution activities, not clinical services. Opportunity exists to integrate these groups into more clinical roles across programs.

Table E-2 Paid Hours per 100 Outpatient Visits, 2023/24

Ratio	Statistics	Patient Care Programs			
		Emergency	Oncology	Dialysis	Other
Pharmacist paid hours per 100 outpatient visits	(n=)	(60)	(33)	(26)	(38)
	10%ile	1.7	6.2	0.0	0.1
	Median	**4.9**	**31.9**	**9.8**	**2.0**
	90%ile	64.1	144.1	38.7	6.3
Pharmacy technician/ pharmacy assistant paid hours per 100 outpatient visits	(n=)	(41)	(28)	(20)	(27)
	10%ile	0.8	8.8	0.0	0.0
	Median	**4.4**	**36.0**	**4.7**	**1.0**
	90%ile	11.6	200.6	829.4	5.6
All paid hours per 100 outpatient visits	(n=)	(66)	(36)	(28)	(43)
	10%ile	1.7	17.8	0.0	0.4
	Median	**7.1**	**63.7**	**10.7**	**2.8**
	90%ile	17.6	223.9	100.6	9.1

Base: All respondents providing benchmarking data

Inpatient Drug Costs

Inpatient drug costs continue to rise in adult critical care and medicine programs.

Table E-3 presents the drug costs for inpatient services/programs per inpatient bed, per patient day and per inpatient admission.

- The drug costs show a variation in the trends from all services/ programs compared to the 2020/21 report.
- Only two respondents reported drug costs for oncology programs; therefore, the results for this program type are not reported and cannot be compared with data in the previous 2020/21 report.
- The following two programs had the largest increases in drug costs per admission between 2020/21 and 2023/24:
  - Adult critical care: $1,406.80 in 2023/24 vs $762.25 in 2020/21
  - Medicine: $410.70 in 2023/24 vs $258.87 in 2020/21

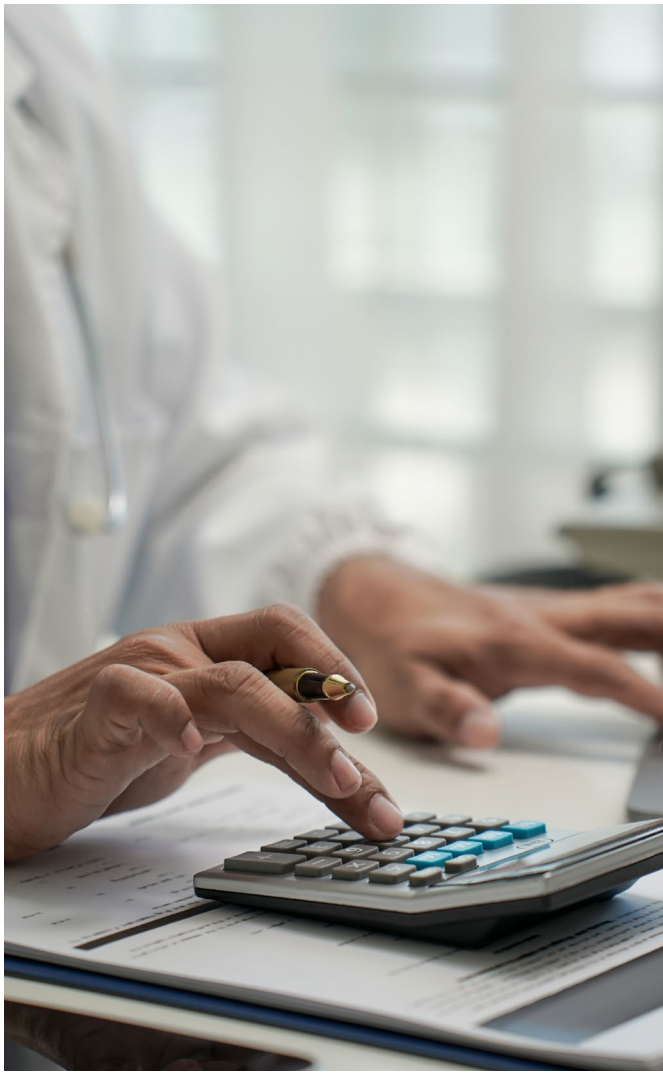


Table E-3 Drug Costs per Inpatient Bed, per Patient Day and per Inpatient Admission, 2023/24 (All Figures Shown in Canadian Dollars)

Ratio	Statistics	Patient Care Programs										
		Adult Critical Care	Pediatric Critical Care	Medicine	Surgery	Pediatrics	Oncol-ogy	Bone Marrow Trans-plant	Obstetrics / Gynecol-ogy	Long-Term Care	Rehabilita-tion	Other
Drug costs per inpatient bed	(n=)	(26)	(16)	(30)	(27)	(17)	(n<5)	(n<5)	(24)	(11)	(19)	(14)
	10%ile	$16 200,00	$833,33	$5 037,98	$5 695,68	$878.79	n/a	n/a	$3 063,86	$1 111,24	$2 286,35	$2 520,09
	Median	**$29 789,90**	**$4 208,80**	**$6 705,70**	**$10 587,40**	**$2 279,80**	**n/a**	**n/a**	**$8 678,40**	**$2 372,40**	**$4 235,60**	**$6 915,90**
	90%ile	$53 656,22	$15 675,30	$16 823,53	$28 577,81	$73 607,86	n/a	n/a	$19 231,73	$4 846,92	$15 359,36	$85 436,93
Drug costs per patient day	(n=)	(26)	(16)	(30)	(27)	(17)	(n<5)	(n<5)	(24)	(10)	(18)	(15)
	10%ile	$54.78	$4.42	$14.16	$17.21	$4.03	n/a	n/a	$8.54	$26.47	$8.07	$5.90
	Median	**$118.20**	**$14.30**	**$19.90**	**$30.30**	**$12.30**	**n/a**	**n/a**	**$48.60**	**$6.30**	**$13.30**	**$26.20**
	90%ile	$170.60	$200.09	$50.64	$121.17	$196.56	n/a	n/a	$71.12	$15.30	$49.65	$235.19
Drug costs per inpatient admission	(n=)	(23)	(16)	(23)	(23)	(15)	(n<5)	(n<5)	(21)	(8)	(13)	(14)
	10%ile	$560.68	$27.63	$127.36	$135.70	$17.73	n/a	n/a	$47.61		$247.41	$48.78
	Median	**$1 406,80**	**$264.50**	**$410.70**	**$251.30**	**$102.00**	**n/a**	**n/a**	**$99.30**	**$700.10**	**$420.80**	**$523.30**
	90%ile	$3 278,23	$4 044,99	$2 304,93	$1 314,55	$1 238,56	n/a	n/a	$131.32		$1 461,30	$5 230,83

Base: All respondents providing benchmarking data. Whenever the n value was less than 5, no data are reported; whenever the n value was between 5 and 9, only the median is reported, without percentiles. n/a = not applicable.

Outpatient Drug Costs

- Median drug costs per outpatient visit in oncology programs were about $600, the highest of any service **(Table E-4)**.
- Median drug costs per outpatient visit in dialysis programs grew by six times ($25.8 in 2023/24 vs $4.3 in 2020/21), which may reflect the introduction of new therapies or the use of higher infusion volumes.

Table E-4 Drug Costs per Outpatient Visit, 2023/24 (All Figures Shown in Canadian Dollars)

Ratio	Statistics	Patient Care Programs			
		Emergency	Oncology	Dialysis	Other
Drug costs per outpatient visit	(n=)	(47)	(25)	(39)	(39)
	10%ile	$4.14	$24.02	$9.82	$1.10
	Median	**$11.20**	**$603.00**	**$25.80**	**$5.10**
	90%ile	$22.04	$2,793,78	$326.57	$26.62

Base: All respondents providing benchmarking data

F - Pharmacy Technician Practice

Bal Dhillon

As the role of pharmacy technicians continues to evolve within Canadian hospitals, it is important to examine how these changes intersect with the broader pharmacy workforce and patient care outcomes. Building on insights from the 2020/21 CSHP Hospital Pharmacy in Canada Survey, (F - Pharmacy Technician Practice), which explored the expanding responsibilities and technological integration of pharmacy technicians, the 2023/24 survey shifted the focus to collaborative dynamics among pharmacy professionals and their effects on healthcare delivery.

This chapter examines how pharmacists, pharmacy technicians and other healthcare team members collaborate to ensure safe, effective and patient-centred medication management. It explores workforce trends, interprofessional collaboration and best practices to illustrate how the pharmacy profession is evolving to meet modern healthcare demands. Drawing on survey data and respondent insights, the chapter highlights current practices and identifies strategies to optimize pharmacy technician roles in support of patient care, medication safety and workforce sustainability.

A clear understanding of the pharmacy technician landscape is essential. For the purposes of the CSHP Hospital Pharmacy in Canada Survey and Report, a pharmacy technician is an individual who is registered, listed or licensed by a provincial regulatory body governing pharmacy practice in their jurisdiction. **Table F-1** lists, for each province, the regulatory authority responsible for pharmacy technician regulation (if present), when regulation was established and the number of licensed hospital pharmacy technicians as of January 2025.[1]

Table F-1 Provincial Regulatory Authorities in Canada with Responsibility for Pharmacy Technicians*

Province	Provincial Regulatory Authority	Date of Implementation	No. of Licensed Hospital Pharmacy Technicians
Ontario	Ontario College of Pharmacists	Dec-10	3 515
British Columbia	College of Pharmacists of British Columbia	Jan-11	1 151
Alberta	Alberta College of Pharmacy	Jul-11	954
Nova Scotia	Nova Scotia College of Pharmacists	Aug-13	105
Manitoba	College of Pharmacists of Manitoba	Jan-14	Technicians "listed" but not licensed as such
Prince Edward Island	Prince Edward Island College of Pharmacists	Sep-14	46
Newfoundland and Labrador	Newfoundland and Labrador Pharmacy Board	Nov-14	Practice setting not tracked
Saskatchewan	Saskatchewan College of Pharmacy Professionals	Oct-15	245
New Brunswick	None: No specific regulation for pharmacy technicians	2015	122
Québec	The title "pharmacy technician" is now used. Pharmacy technical assistants (assistantes techniques en pharmacie) are recognized by the Ordre des pharmaciens du Québec.	n/a	n/a
Total			6 138

n/a = not applicable

*Data as of January 1, 2025, from the National Association of Pharmacy Regulatory Authorities.[1]

As of January 2025, there were 11,541 regulated pharmacy technicians in Canada,[1] an increase of nearly 1,600 over the three-year span from 2020/21, when there were 9,960 regulated pharmacy technicians.[2] Of these, 53% (6,138/11,541) were known to be practising in hospital pharmacy in 2024/25 compared to 49% (4,861/9,960) in 2020/21.

Pharmacy technicians are now recognized in Québec (QC) as those who have completed the three-year Diploma of Collegial Studies (Diplôme d'études collégiales or DEC), a formal pharmacy technician program or a recognition program leading to the DEC. Legislation in QC continues to focus on delegation, whereby the pharmacist remains ultimately responsible, and pharmacy technicians do not have licences. Notably, in the 2023/24 Hospital Pharmacy in Canada Survey, QC facilities reported a total of only two pharmacy technicians.

In Manitoba, pharmacy technicians are regulated by the College of Pharmacists of Manitoba; however, they are still "listed" as regulated pharmacy technicians and are not licensed.[1] As such, in the national statistics compiled by the National Association of Pharmacy Regulatory Authorities, Manitoba technicians are not counted in the total number of licensed pharmacy technicians practising in Canada.

Pharmacy technicians are not regulated in Nunavut, the Northwest Territories or Yukon, nor are they regulated within the Canadian Armed Forces.

The CSHP Hospital Pharmacy in Canada Survey has tracked pharmacy technician roles since 2001/02, but it was only in 2016/17 that the survey began distinguishing between regulated pharmacy technicians and

non-regulated pharmacy assistants. The results of the 2020/21 survey reflected the ongoing evolution of hospital pharmacy practices in response to changing healthcare needs, regulatory shifts and global supply chain challenges, and these trends are further elucidated by the results of the 2023/24 survey reported here.

In terms of reporting regional data from the 2023/24 survey, the convention for the four eastern provinces (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and Newfoundland and Labrador [NL]) remains unchanged from prior reports, and these provinces are designated as the Atlantic region or ATL. Although Alberta (AB) did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, it rejoined the survey for 2023/24. However, unlike reports up to 2016/17, in which AB, Saskatchewan (SK) and Manitoba (MB) were combined as the Prairie region, AB is now treated as a region distinct from the SK/MB combination.

Proportion of Technical Staff Who Are Pharmacy Technicians

To assist with understanding overall workforce planning, role optimization and skill mix in pharmacy operations, the survey asked what percentage of staff who perform technical functions are pharmacy technicians. **Table F-2** shows that the proportions varied widely across respondents This variation reflects differences in how each site has implemented regulation, likely due to factors such as provincial timelines, access to technician training programs and hiring practices. These data show that although progress has been made in implementing the pharmacy technician role, there remains a range in adoption levels across the country.

Table F-2 Percentage of Staff Performing Technical Functions Who Are Pharmacy Technicians, 2023/24

Pharmacy technicians on staff compose ...	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(53)	(47)	(49)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
> 90% of technical staff	59	26	19	14	15	40	4	15	5	3	28	0	8
	40%	**49%**	**40%**	**29%**	**31%**	**42%**		**54%**	**28%**	**15%**	**85%**	**0%**	**31%**
51 - 90% of technical staff	41	12	17	12	15	25	1	13	11	4	5	0	8
	28%	**23%**	**36%**	**24%**	**31%**	**26%**		**46%**	**61%**	**20%**	**15%**	**0%**	**31%**
10 - 50% of technical staff	21	10	8	3	8	13	0	0	2	9	0	0	10
	14%	**19%**	**17%**	**6%**	**17%**	**14%**		**0%**	**11%**	**45%**	**0%**	**0%**	**38%**
< 10% of technical staff	28	5	3	20	10	17	1	0	0	4	0	24	0
	19%	**9%**	**6%**	**41%**	**21%**	**18%**		**0%**	**0%**	**20%**	**0%**	**100%**	**0%**

Base: All respondents; n = 149.
Whenever the n value is less than 10, percentages were not calculated to avoid potentially misleading comparisons.

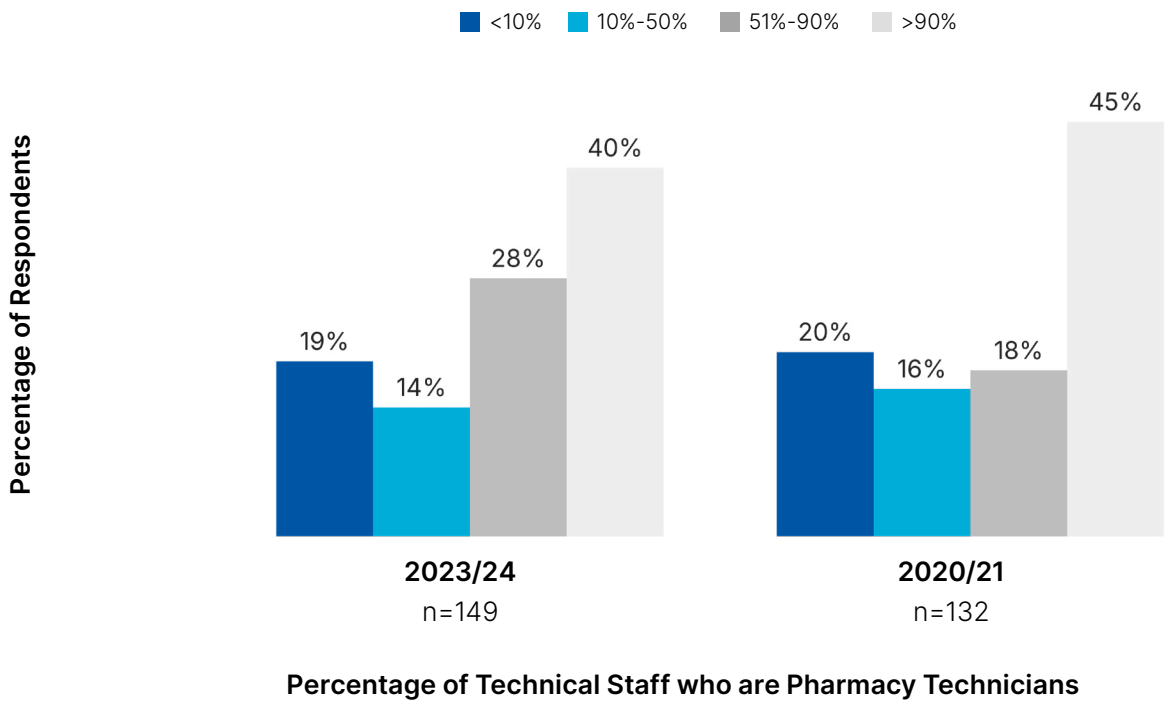
The survey revealed considerable variation, indicating different levels of adoption and integration of pharmacy technicians across the country.

- Overall, 40% (59/149) of respondents reported that more than 90% of their technical staff were pharmacy technicians, indicating strong integration of this professional group.
- In relation to hospital size, facilities with 50–200 beds had the largest proportion (49%, 26/53) reporting that > 90% of technical staff were pharmacy technicians, whereas larger facilities (> 500 beds) had a lower proportion (29%, 14/49) in this category and a correspondingly higher proportion (41%, 20/49) in the <10% category.
- Non-teaching hospitals (42%, 40/95) and pediatric hospitals (4 of 6) were more likely to report > 90% of technical staff being pharmacy technicians, whereas teaching hospitals showed a more even distribution across the categories.
- On a regional basis, QC stood out: 100% (24/24) of respondents from that province reported that <10% of technical staff were pharmacy technicians. This finding is unsurprising, given that the first QC pharmacy technician did not graduate until the end of the current survey period.
- British Columbia (BC; 54%, 15/28) and Ontario (ON; 85%, 28/33) had strong representation in the > 90% category, indicating robust use of pharmacy technicians. Meanwhile, the SK/MB and ATL regions had more even distributions, with 15% (3/20) and 31% (8/26) of respondents, respectively, in the > 90% category.

This regional variation could be due to differences in regulatory environments, staffing models and possibly scope-of-practice expectations across Canada's hospital systems.

Figure F-1 shows a slight decrease from 2020/21 to 2023/24 in the proportion of facilities reporting that pharmacy technicians made up > 90% of technical staff. This change could be due to how respondents interpreted and reported their staffing ratios for the 2023/24 survey; alternatively, differences in the samples of facilities responding in each year could have skewed the data and/or there may have been a temporary decrease in the employment of pharmacy technicians in fiscal year 2023/24. Notably, facilities in AB participated in the 2023/24 survey, but not the 2020/21 survey, which might also have affected these results. Nonetheless, the data indicate a continued shift toward integrating pharmacy technicians into technical roles, with more facilities in 2023/24 reporting that 51%–90% of their technical staff were technicians. This trend supports a strategic approach to optimizing staff utilization, enhancing patient care and ensuring the sustainability of pharmacy services.

Figure F-1 Percentage of Staff Performing Technical Functions who are Pharmacy Technicians, Comparing 2023/24 to 2020/21



Tasks Performed by Pharmacy Technicians and Pharmacy Assistants to Support Pharmacist Clinical Activities

Pharmacy technicians support clinical pharmacy activities in patient care areas beyond drug distribution. The duties performed by technical staff that directly support pharmacists in clinical activities are summarized in **Table F-3**.

Table F-3 Tasks Performed by Pharmacy Technicians and Pharmacy Assistants to Support Pharmacist Clinical Activities, 2023/24

Tasks performed (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Serve as the initial pharmacy liaison for solving drug distribution problems on patient care units	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(27)	(18)	(20)	(33)	(23)	(26)
	Yes (either group)	104	37	33	34	33	67	4	18	14	11	24	17	20
		71%	**71%**	**70%**	**71%**	**69%**	**72%**		**67%**	**78%**	**55%**	**73%**	**74%**	**77%**
	Pharmacy technicians	89	36	31	22	27	58	4	18	14	11	24	2	20
		61%	**69%**	**66%**	**46%**	**56%**	**62%**		**67%**	**78%**	**55%**	**73%**	**9%**	**77%**
	Pharmacy assistants	50	17	15	18	18	30	2	8	4	6	3	17	12
		34%	**33%**	**32%**	**38%**	**38%**	**32%**		**30%**	**22%**	**30%**	**9%**	**74%**	**46%**
	Not applicable	43	15	14	14	15	26	2	9	4	9	9	6	6
		29%	29%	30%	29%	31%	28%		33%	22%	45%	27%	26%	23%
Collect and document information to support medication reconciliation at admission (e.g., BPMH)	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(27)	(18)	(20)	(33)	(23)	(26)
	Yes (either group)	98	28	31	39	37	58	3	13	17	4	30	14	20
		67%	**54%**	**66%**	**81%**	**77%**	**62%**		**48%**	**94%**	**20%**	**91%**	**61%**	**77%**
	Pharmacy technicians	91	27	31	33	33	55	3	13	17	4	30	7	20
		62%	**52%**	**66%**	**69%**	**69%**	**59%**		**48%**	**94%**	**20%**	**91%**	**30%**	**77%**
	Pharmacy assistants	28	9	6	13	13	15	0	0	0	1	4	11	12
		19%	**17%**	**13%**	**27%**	**27%**	**16%**		**0%**	**0%**	**5%**	**12%**	**48%**	**46%**
	Not applicable	49	24	16	9	11	35	3	14	1	16	3	9	6
		33%	46%	34%	19%	23%	38%		52%	6%	80%	9%	39%	23%
Collect and document initial inpatient drug therapy information and discharge drug therapy plan to support medication reconciliation at discharge	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(27)	(18)	(20)	(33)	(23)	(26)
	Yes (either group)	16	2	6	8	4	11	1	1	3	0	2	7	3
		11%	**4%**	**13%**	**17%**	**8%**	**12%**		**4%**	**17%**	**0%**	**6%**	**30%**	**12%**
	Pharmacy technicians	13	2	6	5	4	8	1	1	3	0	2	4	3
		9%	**4%**	**13%**	**10%**	**8%**	**9%**		**4%**	**17%**	**0%**	**6%**	**17%**	**12%**
	Pharmacy assistants	6	2		4	0	6	0	0	0	0	1	4	1
		4%	**4%**		**8%**		**6%**		**0%**	**0%**	**0%**	**3%**	**17%**	**4%**
	Not applicable	131	50	41	40	44	82	5	26	15	20	31	16	23
		89%	96%	87%	83%	92%	88%		96%	83%	100%	94%	70%	88%
Collect laboratory test results to support drug therapy evaluation and monitoring	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(27)	(18)	(20)	(33)	(23)	(26)
	Yes (either group)	16	4	5	7	8	7	1	3	0	3	0	5	5
		11%	**8%**	**11%**	**15%**	**17%**	**8%**		**11%**	**0%**	**15%**	**0%**	**22%**	**19%**
	Pharmacy technicians	13	4	3	6	6	7	0	3	0	2	0	4	4
		9%	**8%**	**6%**	**13%**	**13%**	**8%**		**11%**	**0%**	**10%**	**0%**	**17%**	**15%**
	Pharmacy assistants	7	2	2	3	3	3	1	0	0	2	0	2	3
		5%	**4%**	**4%**	**6%**	**6%**	**3%**		**0%**	**0%**	**10%**	**0%**	**9%**	**12%**
	Not applicable	131	48	42	41	40	86	5	24	18	17	33	18	21
		89%	92%	89%	85%	83%	92%		89%	100%	85%	100%	78%	81%

Table F-3 Tasks Performed by Pharmacy Technicians and Pharmacy Assistants to Support Pharmacist Clinical Activities, 2023/24 (Continued)

Tasks performed (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Assemble pamphlets and documentation to be given to the patient by the pharmacist during medication counselling	(n=)	(146)	(51)	(47)	(48)	(48)	(92)	(6)	(27)	(18)	(19)	(33)	(23)	(26)
	Yes (either group)	10 **7%**	1 **2%**	2 **4%**	7 **15%**	5 **10%**	3 **3%**	2	1 **4%**	3 **17%**	0 **0%**	0 **0%**	5 **22%**	1 **4%**
	Pharmacy technicians	4 **3%**	1 **2%**	1 **2%**	2 **4%**	2 **4%**	1 **1%**	1	1 **4%**	2 **11%**	0 **0%**	0 **0%**	1 **4%**	0 **0%**
	Pharmacy assistants	6 **4%**	0 **0%**	1 **2%**	5 **10%**	3 **6%**	2 **2%**	1	0 **0%**	1 **6%**	0 **0%**	0 **0%**	4 **17%**	1 **4%**
	Not applicable	136 93%	50 98%	45 96%	41 85%	43 90%	89 97%	4	26 96%	15 83%	19 100%	33 100%	18 78%	25 96%
Calculate changes to parenteral nutrition therapy using established protocols and laboratory values	(n=)	(146)	(51)	(47)	(48)	(48)	(92)	(6)	(27)	(18)	(19)	(33)	(23)	(26)
	Yes (either group)	8 **5%**	3 **6%**	2 **4%**	3 **6%**	4 **8%**	4 **4%**	0	2 **7%**	0 **0%**	1 **5%**	2 **6%**	1 **4%**	2 **8%**
	Pharmacy technicians	8 **5%**	3 **6%**	2 **4%**	3 **6%**	4 **8%**	4 **4%**	0	2 **7%**	0 **0%**	1 **5%**	2 **6%**	1 **4%**	2 **8%**
	Pharmacy assistants	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**
	Not applicable	138 95%	48 94%	45 96%	45 94%	44 92%	88 96%	6	25 93%	18 100%	18 95%	31 94%	22 96%	24 92%
Assist in collecting data related to medication management for hospital committees	(n=)	(146)	(52)	(47)	(47)	(47)	(93)	(6)	(27)	(18)	(20)	(33)	(22)	(26)
	Yes (either group)	54 **37%**	23 **44%**	13 **28%**	18 **38%**	22 **47%**	29 **31%**	3	2 **7%**	7 **39%**	6 **30%**	16 **48%**	6 **27%**	17 **65%**
	Pharmacy technicians	49 **34%**	22 **42%**	12 **26%**	15 **32%**	20 **43%**	26 **28%**	3	2 **7%**	7 **39%**	6 **30%**	16 **48%**	1 **5%**	17 **65%**
	Pharmacy assistants	16 **11%**	7 **13%**	4 **9%**	5 **11%**	10 **21%**	6 **6%**	0	0 **0%**	0 **0%**	1 **5%**	0 **0%**	5 **23%**	10 **38%**
	Not applicable	92 63%	29 56%	34 72%	29 62%	25 53%	64 69%	3	25 93%	11 61%	14 70%	17 52%	16 73%	9 35%
Present data related to medication management to hospital committees	(n=)	(146)	(52)	(47)	(47)	(47)	(93)	(6)	(27)	(18)	(20)	(33)	(22)	(26)
	Yes (either group)	27 **18%**	15 **29%**	6 **13%**	6 **13%**	8 **17%**	17 **18%**	2	0 **0%**	5 **28%**	3 **15%**	9 **27%**	1 **5%**	9 **35%**
	Pharmacy technicians	27 **18%**	15 **29%**	6 **13%**	6 **13%**	8 **17%**	17 **18%**	2	0 **0%**	5 **28%**	3 **15%**	9 **27%**	1 **5%**	9 **35%**
	Pharmacy assistants	4 **3%**	4 **8%**	0 **0%**	0 **0%**	3 **6%**	1 **1%**	0	0 **0%**	0 **0%**	0 **0%**	0 **0%**	0 **0%**	4 **15%**
	Not applicable	119 **82%**	37 **71%**	41 **87%**	41 **87%**	39 **83%**	76 **82%**	4	27 **100%**	13 **72%**	17 **85%**	24 **73%**	21 **95%**	17 **65%**

Table F-3 Tasks Performed by Pharmacy Technicians and Pharmacy Assistants to Support Pharmacist Clinical Activities, 2023/24 (Continued)

Tasks performed (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Manage investigational drug inventory and provide technical assistance with clinical trial protocols	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(27)	(18)	(20)	(33)	(23)	(26)
	Yes (either group)	70 **48%**	16 **31%**	21 **45%**	33 **69%**	32 **67%**	35 **38%**	3	14 **52%**	6 **33%**	3 **15%**	26 **79%**	11 **48%**	10 **38%**
	Pharmacy technicians	57 **39%**	15 **29%**	19 **40%**	23 **48%**	23 **48%**	31 **33%**	3	13 **48%**	6 **33%**	2 **10%**	26 **79%**	2 **9%**	8 **31%**
	Pharmacy assistants	21 **14%**	3 **6%**	4 **9%**	14 **29%**	15 **31%**	6 **6%**	0	1 **4%**	1 **6%**	2 **10%**	0 **0%**	11 **48%**	6 **23%**
	Not applicable	77 **52%**	36 **69%**	26 **55%**	15 **31%**	16 **33%**	58 **62%**	3	13 **48%**	12 **67%**	17 **85%**	7 **21%**	12 **52%**	16 **62%**
Other	(n=)	(15)	(8)	(2)	(5)	(5)	(9)	(1)	(0)	(0)	(3)	(5)	(3)	(4)
	Yes (either group)	15 100%	8	2	5	5	9	1	0	0	3	5	3	4
	Pharmacy technicians	15 100%	8	2	5	5	9	1	0	0	3	5	3	4
	Pharmacy assistants	2 13%	0	0	2	2	0	0	0	0	0	1	1	0
	Not applicable	0 0%	0	0	0	0	0	0	0	0	0	0	0	0

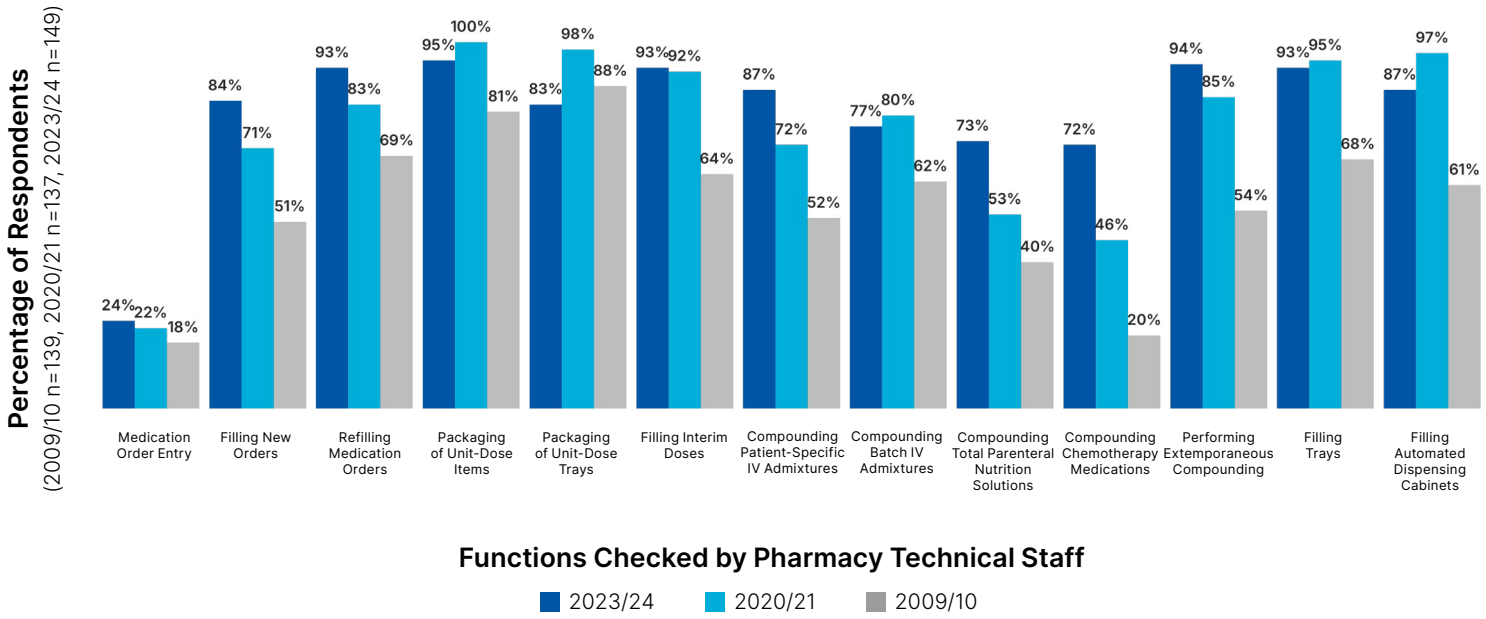
Base: Respondents to each question, n = 15 - 147. Whenever the n value is less than 10, percentages were not calculated to avoid potentially misleading comparisons. BPMH = best possible medication history

- Tasks most commonly performed by pharmacy technicians and pharmacy assistants:
    - About three-quarters (71%, 104/147) of respondents reported that pharmacy technicians or pharmacy assistants acted as the initial liaison for resolving drug distribution problems on patient care units, with pharmacy technicians primarily responsible for this task (61%, 89/147). Regions with high rates of pharmacy technicians performing this task were ON (73%, 24/33), ATL (77%, 20/26) and AB (78%, 14/18). By contrast, SK/MB had the lowest overall utilization of either pharmacy technicians or pharmacy assistants for this task (55%, 11/20) and the highest rate of "not applicable" responses (45%, 9/20), which may indicate that pharmacists manage this task in that region.
    - Two-thirds (67%, 98/147) of respondents reported that pharmacy technicians or pharmacy assistants were involved in medication reconciliation at admission, pharmacy technicians (62%, 91/147) to a greater extent than pharmacy assistants (19%, 28/147). Facilities with > 500 beds (81%, 39/48) and those in certain regions, specifically ON (91%, 30/33) and AB (94%, 17/18), had the highest rates of involvement of technical staff in this task, whereas facilities in SK/MB had the lowest involvement (20%, 4/20).
- Tasks less commonly performed by pharmacy technicians and pharmacy assistants:
    - Just under half (48%, 70/147) of respondents reported involvement of pharmacy technicians (39%, 57/147) and/or pharmacy assistants (14%, 21/147) in managing investigational drug inventory and support of clinical trials. This activity was notably higher in facilities with > 500 beds (69%, 33/48) and among ON facilities (79%, 26/33).
    - Just over a third (37%, 54/146) of respondents reported that pharmacy technicians and/or pharmacy assistants were involved in collecting data for hospital committees. For this task, technician involvement (34%, 49/146) was much higher than assistant involvement (11%, 16/146). Regionally, ATL stood out with the highest engagement (65%, 17/26), followed by ON (48%, 16/33).
    - Less frequently reported tasks included presenting data to committees (18%, 27/146), assembling patient counselling materials (7%, 10/146) and supporting medication reconciliation at discharge (11%, 16/147), suggesting that these tasks are not yet widely delegated. For medication reconciliation at discharge, pharmacy technicians were more involved (9%, 13/147) than pharmacy assistants (4%, 6/147). Medication reconciliation at discharge by pharmacy technicians and/or pharmacy assistants was most common in QC (30%, 7/23) and rare or non-existent in certain other regions.
- Overall, pharmacy technicians were reportedly far more involved than pharmacy assistants in clinically supportive roles.
- Teaching hospitals tended to have greater pharmacy technician involvement than non-teaching hospitals in tasks like managing investigational drugs (67% [32/48] vs. 38% [35/93]) and medication reconciliation at admission (77% [37/48] vs. 62% [58/93]).
- On a regional basis, ON and ATL showed greater involvement of pharmacy technical staff across multiple tasks, particularly for more advanced responsibilities like reconciliation at discharge and committee involvement.
- A total of 15 respondents reported involvement of technical staff in "other" tasks, with 100% (15/15) reporting performance of these tasks by pharmacy technicians. These results suggest a broader or unlisted scope of pharmacy technician activities beyond those explicitly listed in the survey.

Tasks Checked by Pharmacy Technicians and Pharmacy Assistants to Support Pharmacist Clinical Activities

Figure F-2 provides a comparative overview of how responsibilities for checking various tasks have changed over time. Data from 2023/24, 2020/21 and 2009/10 show growth in the number of functions being checked by pharmacy technicians and/or pharmacy assistants, which suggests an evolving scope of practice for both roles. Gaining insight into these shifts can support more effective staffing models and guide the delegation of responsibilities.

Figure F-2 Functions Checked by a Pharmacy Technician and/or Pharmacy Assistant, 2023/24 vs 2020/21 vs 2009/10



- There has been a notable increase in pharmacy technical staff checking more complex functions over time. For example, checking of compounded chemotherapy medications was reported by just 20% (27/137) of respondents in 2009/10, a proportion that rose to 72% (105/146) in 2023/24, indicating a substantial expansion of technician responsibilities. Pharmacy technicians are taking on advanced responsibilities, and this shift is expected to more than double the time that technicians spend on non-traditional activities in the next five years.[3]

- Checking of functions such as filling trays and filling automated dispensing cabinets has had consistently high involvement of pharmacy technical staff; more specifically, 95% (123/129) of respondents in 2020/21 and 93% (139/149) in 2023/24 reported that technical staff checked the filling

of trays, and 97% (118/122) of respondents in 2020/21 and 87% (125/143) in 2023/24 reported that technical staff checked the filling of automated dispensing cabinets.

- There has been a slight increase in reported checking of medication order entry, from 18% (20/114) of respondents in 2009/10 to 24% (35/147) in 2023/24, which suggests either a shift in workflow or potential reallocation of responsibility.

Figure F-3 separates responses by role: pharmacy technician, pharmacy assistant or both.

Figure F-3 Functions Checked by a Pharmacy Technician and/or Pharmacy Assistant, 2023/24

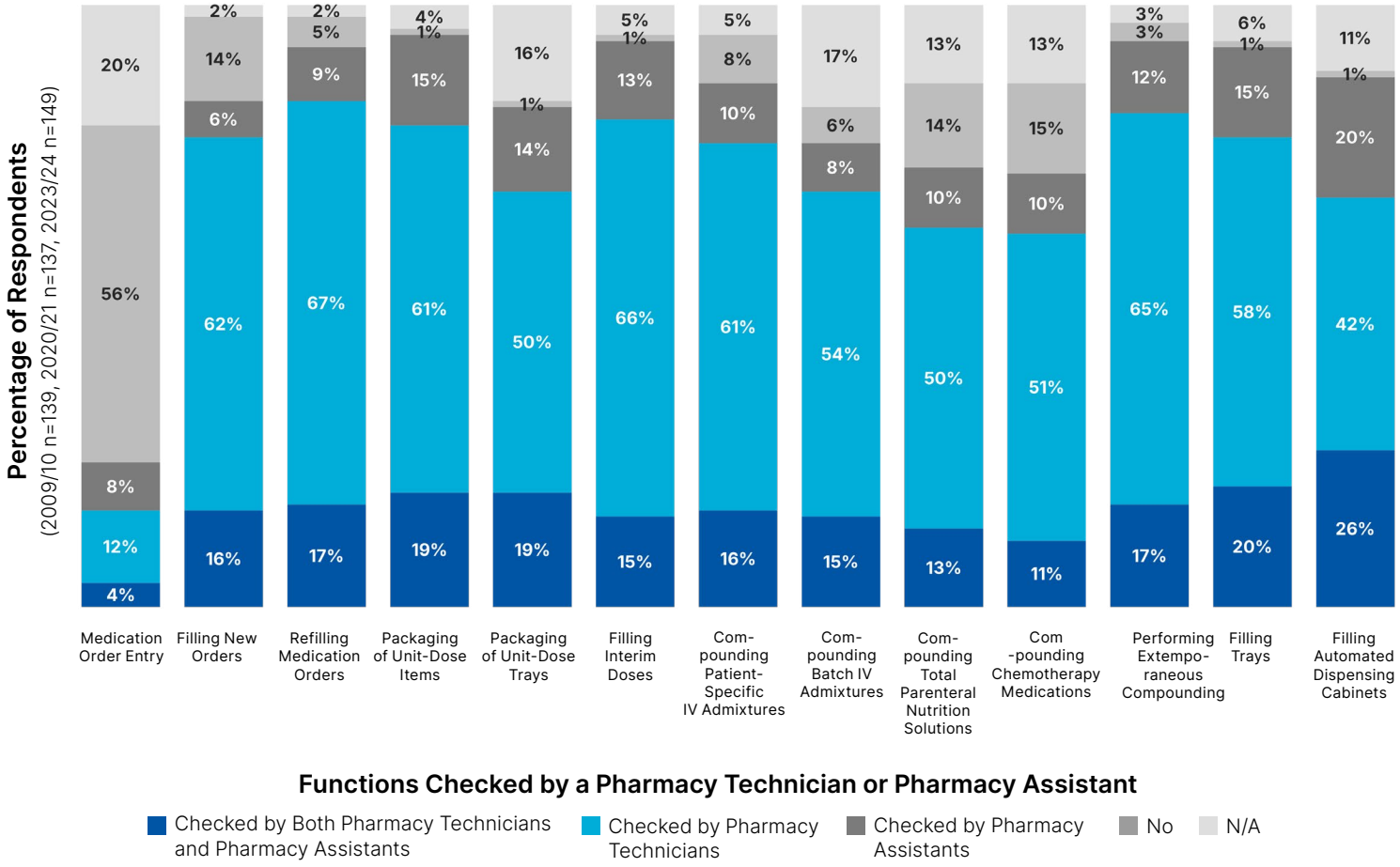


Figure F-3 shows that pharmacy technicians are primarily responsible for critical checks—those directly tied to patient safety—whereas pharmacy assistants tend to be involved in supporting low-risk functions. It also highlights the ongoing transition of checking duties by pharmacy technicians.

Global Data Benchmarking: Canada and the United Kingdom

In Canada, pharmacy technicians are regulated by provincial pharmacy colleges, which leads to variability in standards and practice across the country. In contrast, the United Kingdom (UK) has a nationally

consistent regulatory framework under the General Pharmaceutical Council,[4] with mandatory registration and standardized qualifications.

Canadian pharmacy technicians primarily focus on technical tasks, such as medication preparation, distribution, checking, compounding and inventory management, without involvement in clinical decision-making.[5] In the UK, technicians have a broader and expanding scope of practice that includes medication reconciliation, patient counselling, medicines optimization and adherence support. This shift is driven by a need to improve efficiency and patient care, as well as a recognition of technicians' ability to handle these tasks effectively.[6]

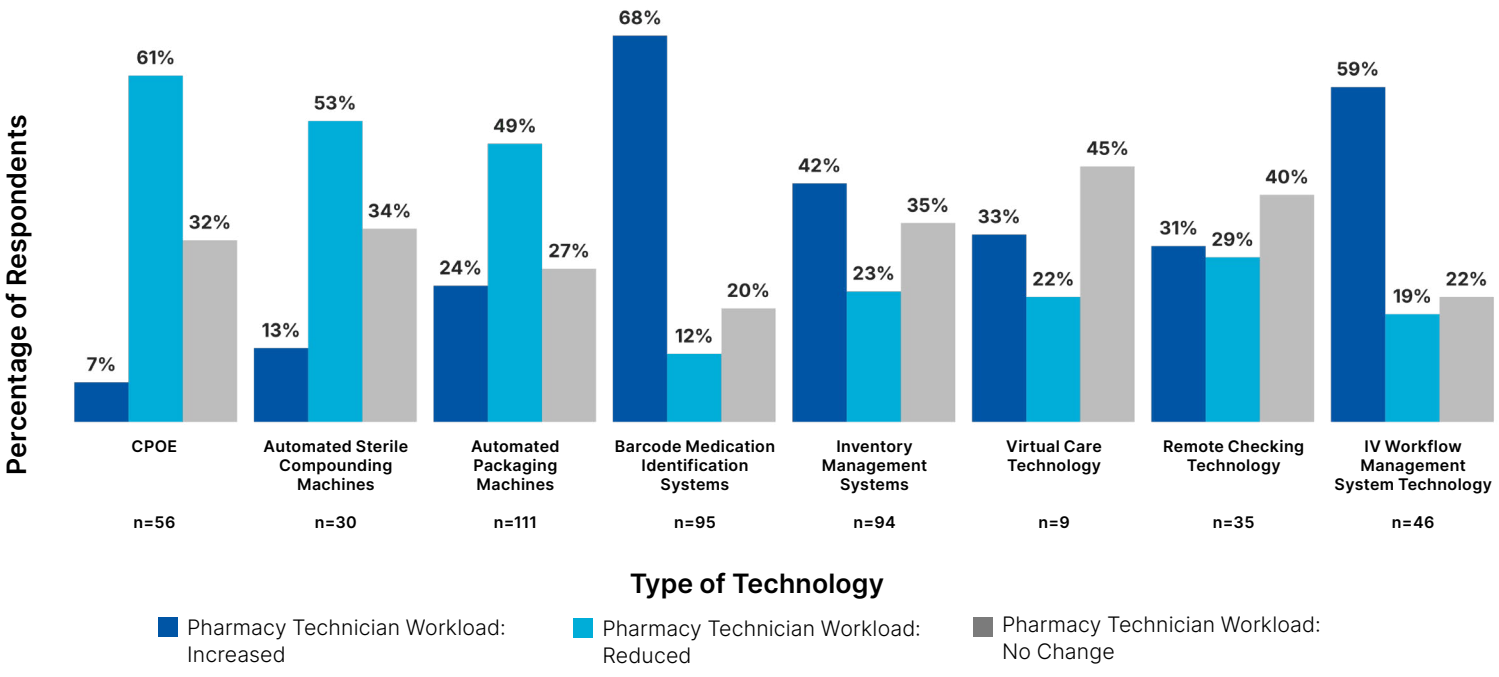
Pharmacy technicians in the UK are well integrated across diverse healthcare settings, including hospitals, general practice clinics, mental health settings and prisons. Although Canada's model of pharmacy technician practice is evolving, particularly in hospital settings, its integration is more limited. Education in Canada is of high quality, but continuing professional development varies by province. In contrast, the UK mandates continuing professional development and offers structured career pathways.

Both countries are advancing the role of pharmacy technicians, albeit at different speeds and with differing frameworks. Each system offers valuable lessons in regulation, workforce planning and optimization of pharmacy technician roles in healthcare.

Impact of Technology Integration on Pharmacy Technical Staff

Figure F-4 illustrates respondents' perceptions of the impact of various technologies on pharmacy technicians' workload.

Figure F-4 Impact of Technologies on the Workload of Pharmacy Technicians, 2023/24



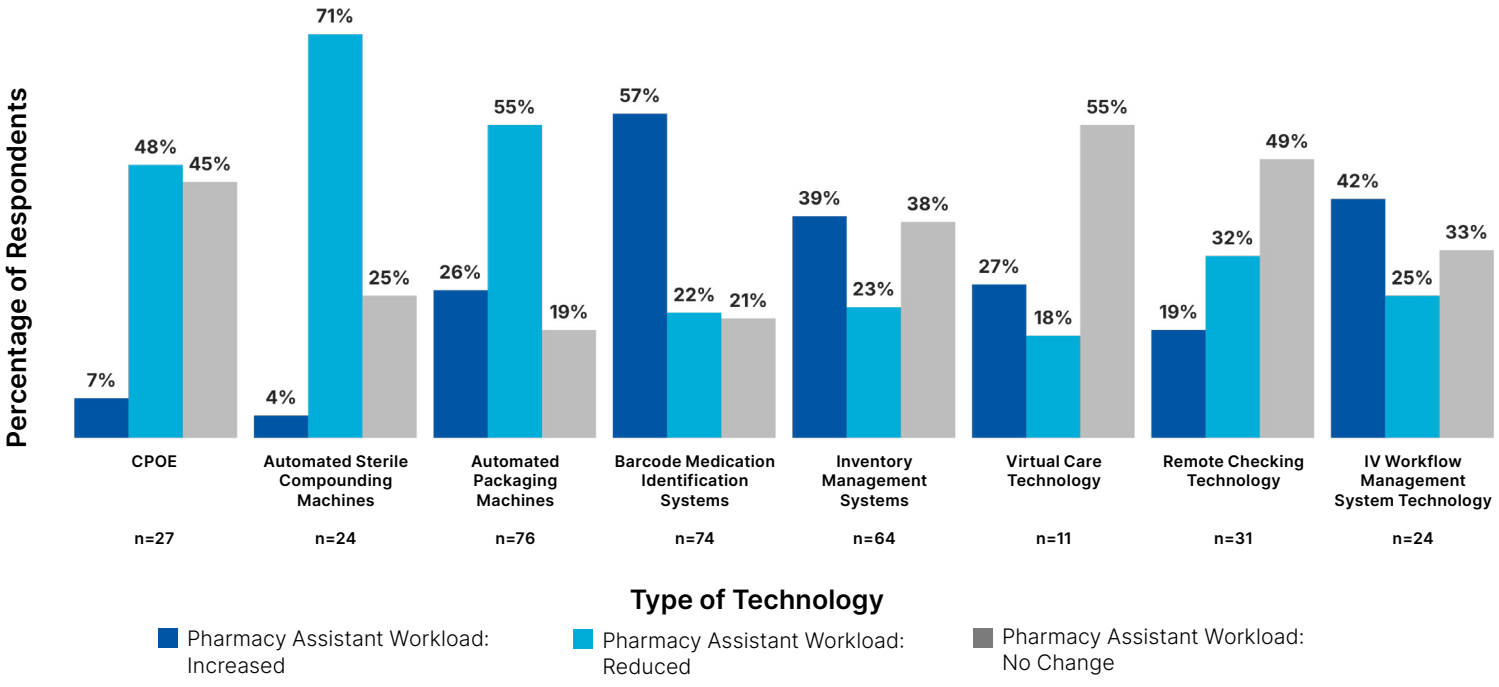
The effects on workload were highly varied:

- About two-thirds (68%, 65/95) of respondents reported that barcode systems increased pharmacy technicians' workload, the highest percentage among all technologies. This finding likely reflects the time and process demands associated with barcode scanning and documentation.
- Well over half (61%, 34/56) of respondents indicated that computerized provider order entry (CPOE) reduced pharmacy technicians' workload.
- Similarly, about half of respondents reported that automated sterile compounding machines (53%, 16/30) and automated packaging machines (49%, 54/111) were associated with workload reductions for pharmacy technicians.
- Despite being designed to streamline processes, IV workflow management systems were reported by 59% (27/46) of respondents to increase the pharmacy technicians' workload, which suggests that implementation of this technology may involve complex processes or oversight duties for technicians.

Overall, technologies that automate physical tasks (like compounding and packaging) were believed to reduce workload, while those requiring verification or workflow oversight were believed to increase it. Although some technologies improve safety, they may also introduce additional steps, thus shifting rather than reducing workload.

Figure F-5 illustrates respondents' perceptions of the impact of various technologies on pharmacy assistants' workload.

Figure F-5 Impact of Technologies on the Workload of Pharmacy Assistants, 2023/24



- Respondents generally reported workload increases for pharmacy assistants with implementation of technologies involving verification (specifically, barcode scanning, IV workflow).
- Respondents generally reported workload reductions for pharmacy assistants with implementation of automated systems (especially sterile compounding and packaging), and these workload reductions were greater than those experienced by pharmacy technicians for the same automated systems.
- Technologies like CPOE and automation tools are generally viewed as beneficial, whereas those requiring additional steps (such as barcode and IV workflow systems) are perceived to increase workload, especially for pharmacy assistants.

Enhanced Roles Performed by Pharmacy Technicians

Since 2020/21, there appears to be increased utilization of pharmacy technicians; however, several responsibilities remain primarily the domain of pharmacists. **Table F-4** shows that pharmacy technicians now perform many tasks in various settings. Nonetheless, despite reductions since 2020/21, the following functions continue to be performed primarily by pharmacists:

- Development of master formulas or compounding protocols by pharmacists dropped from 92% (125/136) of respondents in 2020/21 to 73% (102/140) in 2023/24.
- Determination of beyond-use dates by pharmacists declined from 89% (120/135) to 71% (98/139).
- Pharmacists' provision of instructions on operating medical devices fell slightly, from 89% (97/109) to 87% (91/105).
- Supervision of the dispensary by pharmacists declined from 87% (108/124) to 61% (81/132).
- There was a shift seen for the supervision of regional distribution centres by pharmacists, which dropped from 79% (45/57) in 2020/21 to 61% (40/66) in 2023/24, and the transfer of prescriptions (except controlled substances) by pharmacists, which declined from 88% (63/72) to 71% (30/42). This presents an opportunity for role optimization to enable pharmacists to focus on higher level clinical activities.

These changes indicate a trend toward broader task sharing with pharmacy technicians, while pharmacists retain responsibility for clinical and system-based functions.

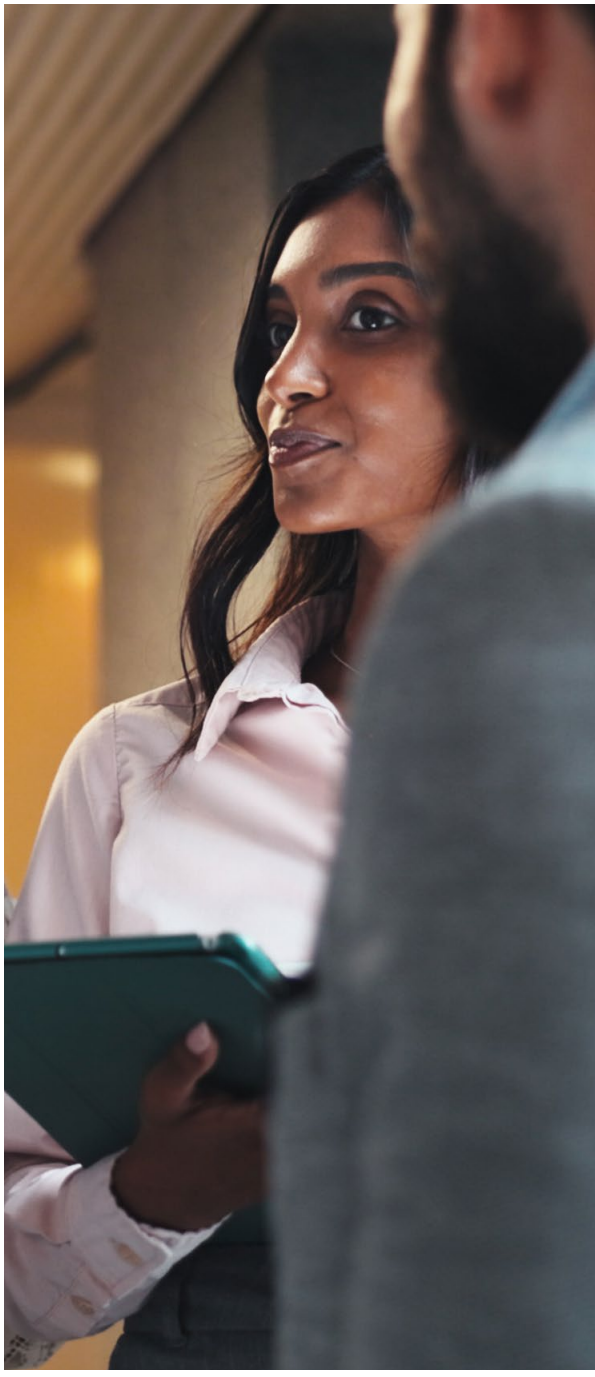


Table F-4 Staff Performing Pharmacy Functions, 2023/24

Function (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pedi-atric	BC	AB	SK/MB	ON	QC	ATL
Developing master formulas or compounding protocols	(n=)	(140)	(48)	(43)	(49)	(46)	(89)	(5)	(28)	(12)	(19)	(33)	(23)	(25)
	Pharmacist	102	35	30	37	31	68	3	22	6	12	21	22	19
		73%	**73%**	**70%**	**76%**	**67%**	**76%**		**79%**	**50%**	**63%**	**64%**	**96%**	**76%**
	(Net) Pharmacy technician/ assistant	38	13	13	12	15	21	2	6	6	7	12	1	6
		27%	**27%**	**30%**	**24%**	**33%**	**24%**		**21%**	**50%**	**37%**	**36%**	**4%**	**24%**
	Pharmacy technician	38	13	13	12	15	21	2	6	6	7	12	1	6
		27%	**27%**	**30%**	**24%**	**33%**	**24%**		**21%**	**50%**	**37%**	**36%**	**4%**	**24%**
Sterile compounding of pharmaceuticals	(n=)	(145)	(50)	(45)	(50)	(48)	(92)	(5)	(27)	(18)	(19)	(32)	(23)	(26)
	(Net) Pharmacy technician/ assistant	145	50	45	50	48	92	5	27	18	19	32	23	26
		100%	**100%**	**100%**	**100%**	**100%**	**100%**		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	Pharmacy technician	103	39	36	28	32	67	4	27	18	7	32	0	19
		71%	**78%**	**80%**	**56%**	**67%**	**73%**		**100%**	**100%**	**37%**	**100%**	**0%**	**73%**
	Pharmacy assistant	42	11	9	22	16	25	1	0	0	12	0	23	7
		29%	**22%**	**20%**	**44%**	**33%**	**27%**		**0%**	**0%**	**63%**	**0%**	**100%**	**27%**
Non-sterile compounding of pharmaceuticals	(n=)	(147)	(51)	(46)	(50)	(48)	(94)	(5)	(28)	(18)	(19)	(33)	(23)	(26)
	(Net) Pharmacy technician/ assistant	147	51	46	50	48	94	5	28	18	19	33	23	26
		100%	**100%**	**100%**	**100%**	**100%**	**100%**		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	Pharmacy technician	94	36	33	25	29	61	4	26	17	6	31	0	14
		64%	**71%**	**72%**	**50%**	**60%**	**65%**		**93%**	**94%**	**32%**	**94%**	**0%**	**54%**
	Pharmacy assistant	53	15	13	25	19	33	1	2	1	13	2	23	12
		36%	**29%**	**28%**	**50%**	**40%**	**35%**		**7%**	**6%**	**68%**	**6%**	**100%**	**46%**
Determining beyond-use date (BUD)	(n=)	(139)	(46)	(44)	(49)	(46)	(88)	(5)	(27)	(12)	(19)	(32)	(23)	(26)
	Pharmacist	98	26	32	40	33	62	3	21	7	10	24	22	14
		71%	**57%**	**73%**	**82%**	**72%**	**70%**		**78%**	**58%**	**53%**	**75%**	**96%**	**54%**
	(Net) Pharmacy technician/ assistant	41	20	12	9	13	26	2	6	5	9	8	1	12
		29%	**43%**	**27%**	**18%**	**28%**	**30%**		**22%**	**42%**	**47%**	**25%**	**4%**	**46%**
	Pharmacy technician	40	20	12	8	13	25	2	6	5	9	8	0	12
		29%	**43%**	**27%**	**16%**	**28%**	**28%**		**22%**	**42%**	**47%**	**25%**	**0%**	**46%**
	Pharmacy assistant	1	0	0	1	0	1	0	0	0	0	0	1	0
		1%	**0%**	**0%**	**2%**	**0%**	**1%**		**0%**	**0%**	**0%**	**0%**	**4%**	**0%**
Receiving verbal orders (except for controlled substances)	(n=)	(137)	(49)	(41)	(47)	(43)	(90)	(4)	(28)	(13)	(19)	(31)	(22)	(24)
	Pharmacist	128	41	40	47	43	83	2	28	13	16	29	22	20
		93%	**84%**	**98%**	**100%**	**100%**	**92%**		**100%**	**100%**	**84%**	**94%**	**100%**	**83%**
	(Net) Pharmacy technician/ assistant	9	8	1	0	0	7	2	0	0	3	2	0	4
		7%	**16%**	**2%**	**0%**	**0%**	**8%**		**0%**	**0%**	**16%**	**6%**	**0%**	**17%**
	Pharmacy Technician	9	8	1	0	0	7	2	0	0	3	2	0	4
		7%	**16%**	**2%**	**0%**	**0%**	**8%**		**0%**	**0%**	**16%**	**6%**	**0%**	**17%**

Table F-4 Staff Performing Pharmacy Functions, 2023/24 (Continued)

Function (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pedi-atric	BC	AB	SK/MB	ON	QC	ATL
Performing the final product check for new prescriptions, including prescriptions for controlled and hazardous substances	(n=)	(146)	(51)	(46)	(49)	(48)	(93)	(5)	(28)	(18)	(19)	(32)	(23)	(26)
	Pharmacist	30	12	7	11	8	19	3	5	0	7	7	10	1
		21%	**24%**	**15%**	**22%**	**17%**	**20%**		**18%**	**0%**	**37%**	**22%**	**43%**	**4%**
	(Net) Pharmacy technician/ assistant	116	39	39	38	40	74	2	23	18	12	25	13	25
		79%	**76%**	**85%**	**78%**	**83%**	**80%**		**82%**	**100%**	**63%**	**78%**	**57%**	**96%**
	Pharmacy technician	104	38	38	28	36	66	2	23	18	12	25	2	24
		71%	**75%**	**83%**	**57%**	**75%**	**71%**		**82%**	**100%**	**63%**	**78%**	**9%**	**92%**
	Pharmacy assistant	12	1	1	10	4	8	0	0	0	0	0	11	1
		8%	**2%**	**2%**	**20%**	**8%**	**9%**		**0%**	**0%**	**0%**	**0%**	**48%**	**4%**
Performing the final product check for refill prescriptions, including refill prescriptions for controlled and hazardous substances	(n=)	(145)	(50)	(46)	(49)	(48)	(92)	(5)	(28)	(18)	(19)	(31)	(23)	(26)
	Pharmacist	22	10	3	9	5	15	2	4	0	5	5	7	1
		15%	**20%**	**7%**	**18%**	**10%**	**16%**		**14%**	**0%**	**26%**	**16%**	**30%**	**4%**
	(Net) Pharmacy technician/ assistant	123	40	43	40	43	77	3	24	18	14	26	16	25
		85%	**80%**	**93%**	**82%**	**90%**	**84%**		**86%**	**100%**	**74%**	**84%**	**70%**	**96%**
	Pharmacy technician	106	38	40	28	37	66	3	24	18	14	26	1	23
		73%	**76%**	**87%**	**57%**	**77%**	**72%**		**86%**	**100%**	**74%**	**84%**	**4%**	**88%**
	Pharmacy assistant	17	2	3	12	6	11	0	0	0	0	0	15	2
		12%	**4%**	**7%**	**24%**	**13%**	**12%**		**0%**	**0%**	**0%**	**0%**	**65%**	**8%**
Transferring prescriptions (except for controlled substances)	(n=)	(42)	(15)	(11)	(16)	(12)	(29)	(1)	(9)	(4)	(4)	(6)	(11)	(8)
	Pharmacist	30	10	10	10	8	22	0	7	3	4	3	8	5
		71%	**67%**	**91%**	**63%**	**67%**	**76%**						**73%**	
	(Net) Pharmacy technician/ assistant	12	5	1	6	4	7	1	2	1	0	3	3	3
		29%	**33%**	**9%**	**38%**	**33%**	**24%**						**27%**	
	Pharmacy technician	8	5	0	3	2	5	1	1	1	0	3	0	3
		19%	**33%**	**0%**	**19%**	**17%**	**17%**						**0%**	
	Pharmacy assistant	4	0	1	3	2	2	0	1	0	0	0	3	0
		10%	**0%**	**9%**	**19%**	**17%**	**7%**						**27%**	
Providing instructions on how to operate medical devices	(n=)	(105)	(40)	(29)	(36)	(31)	(70)	(4)	(20)	(14)	(17)	(23)	(14)	(17)
	Pharmacist	91	35	23	33	25	64	2	18	9	17	19	13	15
		87%	**88%**	**79%**	**92%**	**81%**	**91%**		**90%**	**64%**	**100%**	**83%**	**93%**	**88%**
	(Net) Pharmacy technician/ assistant	6	3	2	1	1	4	1	1	1	0	2	1	1
		6%	**8%**	**7%**	**3%**	**3%**	**6%**		**5%**	**7%**	**0%**	**9%**	**7%**	**6%**
	Pharmacy technician	6	3	2	1	1	4	1	1	1	0	2	1	1
		6%	**8%**	**7%**	**3%**	**3%**	**6%**		**5%**	**7%**	**0%**	**9%**	**7%**	**6%**
	Pharmacy assistant	8	2	4	2	5	2	1	1	4	0	2	0	1
		8%	**5%**	**14%**	**6%**	**16%**	**3%**		**5%**	**29%**	**0%**	**9%**	**0%**	**6%**

Table F-4 Staff Performing Pharmacy Functions, 2023/24 (Continued)

Function (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pedi-atric	BC	AB	SK/MB	ON	QC	ATL
Supervising the pharmacy operations of a regional distribution centre	(n=)	(66)	(23)	(22)	(21)	(19)	(46)	(1)	(13)	(11)	(10)	(12)	(8)	(12)
	Pharmacist	40	14	10	16	13	26	1	8	3	8	7	8	6
		61%	61%	45%	76%	68%	57%		62%	27%	80%	58%		50%
	(Net) Pharmacy technician/ assistant	26	9	12	5	6	20	0	5	8	2	5	0	6
		39%	39%	55%	24%	32%	43%		38%	73%	20%	42%		50%
	Pharmacy Technician	26	9	12	5	6	20	0	5	8	2	5	0	6
		39%	39%	55%	24%	32%	43%		38%	73%	20%	42%		50%
Supervising the pharmacy dispensary in your facility	(n=)	(132)	(48)	(43)	(41)	(44)	(83)	(5)	(28)	(15)	(19)	(32)	(12)	(26)
	Pharmacist	81	28	21	32	26	52	3	19	6	12	21	12	11
		61%	58%	49%	78%	59%	63%		68%	40%	63%	66%	100%	42%
	(Net) Pharmacy technician/ assistant	51	20	22	9	18	31	2	9	9	7	11	0	15
		39%	42%	51%	22%	41%	37%		32%	60%	37%	34%	0%	58%
	Pharmacy technician	47	18	21	8	15	30	2	9	9	7	11	0	11
		36%	38%	49%	20%	34%	36%		32%	60%	37%	34%	0%	42%
	Pharmacy assistant	4	2	1	1	3	1	0	0	0	0	0	0	4
		3%	4%	2%	2%	7%	1%		0%	0%	0%	0%	0%	15%
Creating, updating and validating the drug database library in your facility	(n=)	(134)	(44)	(41)	(49)	(46)	(83)	(5)	(25)	(13)	(16)	(33)	(22)	(25)
	Pharmacist	119	39	34	46	42	72	5	17	9	14	32	22	25
		89%	89%	83%	94%	91%	87%		68%	69%	88%	97%	100%	100%
	(Net) Pharmacy technician/ assistant	3	2	0	1	1	2	0	1	1	0	1	0	0
		2%	5%	0%	2%	2%	2%		4%	8%	0%	3%	0%	0%
	Pharmacy Technician	3	2	0	1	1	2	0	1	1	0	1	0	0
		2%	5%	0%	2%	2%	2%		4%	8%	0%	3%	0%	0%
	Non-pharmacy personnel	12	3	7	2	3	9	0	7	3	2	0	0	0
		9%	7%	17%	4%	7%	11%		28%	23%	13%	0%	0%	0%
Performing final verification of compounded non-sterile pharmaceuticals, including narcotics and controlled substances	(n=)	(147)	(52)	(46)	(49)	(48)	(94)	(5)	(28)	(18)	(20)	(32)	(23)	(26)
	Pharmacist	37	12	7	18	13	23	1	6	0	8	8	11	4
		25%	23%	15%	37%	27%	24%		21%	0%	40%	25%	48%	15%
	(Net) Pharmacy technician/ assistant	110	40	39	31	35	71	4	22	18	12	24	12	22
		75%	77%	85%	63%	73%	76%		79%	100%	60%	75%	52%	85%
	Pharmacy technician	98	39	36	23	29	65	4	22	18	12	24	2	20
		67%	75%	78%	47%	60%	69%		79%	100%	60%	75%	9%	77%
	Pharmacy assistant	12	1	3	8	6	6	0	0	0	0	0	10	2
		8%	2%	7%	16%	13%	6%		0%	0%	0%	0%	43%	8%

Table F-4 Staff Performing Pharmacy Functions, 2023/24 (Continued)

Function (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pedi-atric	BC	AB	SK/MB	ON	QC	ATL
Performing final verification of compounded sterile non-hazardous pharmaceuticals, including narcotics and controlled substances	(n=)	(142)	(50)	(43)	(49)	(46)	(91)	(5)	(27)	(18)	(19)	(32)	(22)	(24)
	Pharmacist	44	16	9	19	16	25	3	7	0	8	8	12	9
		31%	**32%**	**21%**	**39%**	**35%**	**27%**		**26%**	**0%**	**42%**	**25%**	**55%**	**38%**
	(Net) Pharmacy technician/ assistant	98	34	34	30	30	66	2	20	18	11	24	10	15
		69%	**68%**	**79%**	**61%**	**65%**	**73%**		**74%**	**100%**	**58%**	**75%**	**45%**	**63%**
	Pharmacy technician	89	34	31	24	26	61	2	20	18	11	24	2	14
		63%	**68%**	**72%**	**49%**	**57%**	**67%**		**74%**	**100%**	**58%**	**75%**	**9%**	**58%**
	Pharmacy assistant	9	0	3	6	4	5	0	0	0	0	0	8	1
		6%	**0%**	**7%**	**12%**	**9%**	**5%**		**0%**	**0%**	**0%**	**0%**	**36%**	**4%**
Performing final verification of compounded sterile hazardous (chemotherapy) pharmaceuticals	(n=)	(131)	(44)	(38)	(49)	(45)	(81)	(5)	(24)	(13)	(18)	(29)	(22)	(25)
	Pharmacist	61	19	16	26	24	34	3	11	2	12	11	14	11
		47%	**43%**	**42%**	**53%**	**53%**	**42%**		**46%**	**15%**	**67%**	**38%**	**64%**	**44%**
	(Net) Pharmacy technician/ assistant	70	25	22	23	21	47	2	13	11	6	18	8	14
		53%	**57%**	**58%**	**47%**	**47%**	**58%**		**54%**	**85%**	**33%**	**62%**	**36%**	**56%**
	Pharmacy technician	63	25	20	18	18	43	2	13	11	6	18	2	13
		48%	**57%**	**53%**	**37%**	**40%**	**53%**		**54%**	**85%**	**33%**	**62%**	**9%**	**52%**
	Pharmacy assistant	7	0	2	5	3	4	0	0	0	0	0	6	1
		5%	**0%**	**5%**	**10%**	**7%**	**5%**		**0%**	**0%**	**0%**	**0%**	**27%**	**4%**
Performing quality audits on automated systems (e.g., ADCs, IV mixing systems)	(n=)	(119)	(35)	(40)	(44)	(41)	(74)	(4)	(21)	(14)	(10)	(32)	(21)	(21)
	Pharmacist	18	5	7	6	4	14	0	4	0	4	2	4	4
		15%	**14%**	**18%**	**14%**	**10%**	**19%**		**19%**	**0%**	**40%**	**6%**	**19%**	**19%**
	(Net) Pharmacy technician/ assistant	100	30	32	38	37	59	4	17	14	6	30	17	16
		84%	**86%**	**80%**	**86%**	**90%**	**80%**		**81%**	**100%**	**60%**	**94%**	**81%**	**76%**
	Pharmacy technician	80	28	28	24	27	49	4	17	13	5	30	2	13
		67%	**80%**	**70%**	**55%**	**66%**	**66%**		**81%**	**93%**	**50%**	**94%**	**10%**	**62%**
	Pharmacy assistant	20	2	4	14	10	10	0	0	1	1	0	15	3
		17%	**6%**	**10%**	**32%**	**24%**	**14%**		**0%**	**7%**	**10%**	**0%**	**71%**	**14%**
	Non-pharmacy personnel	1	0	1	0	0	1	0	0	0	0	0	0	1
		1%	**0%**	**3%**	**0%**	**0%**	**1%**		**0%**	**0%**	**0%**	**0%**	**0%**	**5%**
Performing quality audits on sterile compounding personnel	(n=)	(141)	(47)	(45)	(49)	(47)	(89)	(5)	(27)	(18)	(16)	(32)	(22)	(26)
	Pharmacist	31	10	5	16	10	20	1	2	0	4	1	17	7
		22%	**21%**	**11%**	**33%**	**21%**	**22%**		**7%**	**0%**	**25%**	**3%**	**77%**	**27%**
	(Net) Pharmacy technician/ assistant	110	37	40	33	37	69	4	25	18	12	31	5	19
		78%	**79%**	**89%**	**67%**	**79%**	**78%**		**93%**	**100%**	**75%**	**97%**	**23%**	**73%**
	Pharmacy technician	104	36	39	29	34	66	4	25	18	12	31	2	16
		74%	**77%**	**87%**	**59%**	**72%**	**74%**		**93%**	**100%**	**75%**	**97%**	**9%**	**62%**
	Pharmacy assistant	6	1	1	4	3	3	0	0	0	0	0	3	3
		4%	**2%**	**2%**	**8%**	**6%**	**3%**		**0%**	**0%**	**0%**	**0%**	**14%**	**12%**

Table F-4 Staff Performing Pharmacy Functions, 2023/24 (Continued)

Function (multiple options allowed)		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pedi-atric	BC	AB	SK/MB	ON	QC	ATL
Creating, updating and validating the pharmacy information system (PIS)	(n=)	(123)	(39)	(37)	(47)	(41)	(77)	(5)	(19)	(9)	(15)	(32)	(23)	(25)
	Pharmacist	87	27	22	38	29	53	5	9	8	12	23	21	14
		71%	**69%**	**59%**	**81%**	**71%**	**69%**		**47%**		**80%**	**72%**	**91%**	**56%**
	(Net) Pharmacy technician/ assistant	27	9	10	8	11	16	0	5	1	2	6	2	11
		22%	**23%**	**27%**	**17%**	**27%**	**21%**		**26%**		**13%**	**19%**	**9%**	**44%**
	Pharmacy technician	20	7	8	5	5	15	0	5	1	2	6	1	5
		16%	**18%**	**22%**	**11%**	**12%**	**19%**		**26%**		**13%**	**19%**	**4%**	**20%**
	Pharmacy assistant	7	2	2	3	6	1	0	0	0	0	0	1	6
		6%	**0,05**	**5%**	**6%**	**15%**	**1%**		**0%**		**0**	**0**	**4%**	**24%**
	Non-pharmacy personnel	9	3	5	1	1	8	0	5	0	1	3	0	0
		7%	**8%**	**14%**	**2%**	**2%**	**10%**		**26%**		**7%**	**9%**	**0%**	**0%**
Evaluating compliance with NAPRA/OPQ compounding standards	(n=)	(142)	(49)	(44)	(49)	(46)	(91)	(5)	(26)	(18)	(19)	(33)	(22)	(24)
	Pharmacist	55	13	13	29	16	37	2	10	0	4	11	21	9
		39%	**27%**	**30%**	**59%**	**35%**	**41%**		**38%**	**0%**	**21%**	**33%**	**95%**	**38%**
	(Net) Pharmacy technician/ assistant	87	36	31	20	30	54	3	16	18	15	22	1	15
		61%	**73%**	**70%**	**41%**	**65%**	**59%**		**62%**	**100%**	**79%**	**67%**	**5%**	**63%**
	Pharmacy technician	86	35	31	20	29	54	3	16	18	15	22	1	14
		61%	**71%**	**70%**	**41%**	**63%**	**59%**		**62%**	**100%**	**79%**	**67%**	**5%**	**58%**
	Pharmacy assistant	1	1	0	0	1	0	0	0	0	0	0	0	1
		1%	**2%**	**0%**	**0%**	**2%**	**0%**		**0%**	**0%**	**0%**	**0%**	**0%**	**4%**
Supervising and/ or coordinating technology and equipment	(n=)	(144)	(50)	(44)	(50)	(47)	(92)	(5)	(27)	(16)	(19)	(33)	(23)	(26)
	Pharmacist	59	15	13	31	23	35	1	13	2	8	11	18	7
		41%	**30%**	**30%**	**62%**	**49%**	**38%**		**48%**	**13%**	**42%**	**33%**	**78%**	**27%**
	(Net) Pharmacy technician/ assistant	83	33	31	19	24	55	4	13	13	11	22	5	19
		58%	**66%**	**70%**	**38%**	**51%**	**60%**		**48%**	**81%**	**58%**	**67%**	**22%**	**73%**
	Pharmacy technician	74	30	28	16	21	49	4	13	13	11	22	2	13
		51%	**60%**	**64%**	**32%**	**45%**	**53%**		**48%**	**81%**	**58%**	**67%**	**9%**	**50%**
	Pharmacy assistant	9	3	3	3	3	6	0	0	0	0	0	3	6
		6%	**6%**	**7%**	**6%**	**6%**	**7%**		**0%**	**0%**	**0%**	**0%**	**13%**	**23%**
	Non-pharmacy personnel	2	2	0	0	0	2	0	1	1	0	0	0	0
		1%	**4%**	**0%**	**0%**	**0%**	**2%**		**4%**	**6%**	**0%**	**0%**	**0%**	**0%**

Base: All respondents, n = 147 ; for each function, the n value shown (and used to calculate percentages) excludes the n/a (not applicable) responses.
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons.
"(Net) Pharmacy technician/assistant" represents the sum of responses for pharmacy technicians and pharmacy assistants for each function.
If there were no responses entered for a particular pharmacy staff role, that role is not shown in the table.
ADC = automated dispensing cabinet; NAPRA = National Association of Pharmacy Regulatory Authorities; OPQ = Order des pharmaciens du Québec

Support for Pharmacy Technicians to Perform Specific Functions

As in the 2020/21 survey, the 2023/24 survey included a question about whether organizations would support the performance of certain functions by pharmacy technicians, provided they had appropriate education and training.

Table F-5 Support of Pharmacy Technicians to Perform Certain Functions, 2023/24

Would your organization support the performance of any of the following functions by a pharmacy technician with appropriate education and training?		All	Bed Size			Hospital Type			Region					
			50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Independently destroying unserviceable narcotics and controlled substances (without pharmacist participation)	(n=)	(148)	(53)	(47)	(48)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
	Yes	132	51	40	41	43	84	5	25	16	18	29	19	25
		89%	**96%**	**85%**	**85%**	**90%**	**89%**		**89%**	**89%**	**90%**	**91%**	**79%**	**96%**
Administering medications by injection or inhalation	(n=)	(148)	(53)	(47)	(48)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
	Yes	76	29	23	24	27	46	3	15	9	9	13	12	18
		51%	**55%**	**49%**	**50%**	**56%**	**49%**		**54%**	**50%**	**45%**	**41%**	**50%**	**69%**
Witnessing ingestion of opioid replacement therapy (e.g., methadone, buprenorphine/ naloxone)	(n=)	(147)	(52)	(47)	(48)	(48)	(93)	(6)	(28)	(17)	(20)	(32)	(24)	(26)
	Yes	73	31	19	23	25	45	3	13	6	10	12	15	17
		50%	**60%**	**40%**	**48%**	**52%**	**48%**		**46%**	**35%**	**50%**	**38%**	**63%**	**65%**
Receiving verbal prescriptions for narcotics and controlled substances	(n=)	(148)	(53)	(47)	(48)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
	Yes	72	30	22	20	24	44	4	16	3	12	9	11	21
		49%	**57%**	**47%**	**42%**	**50%**	**47%**		**57%**	**17%**	**60%**	**28%**	**46%**	**81%**

Base: respondents, n = 148
When the n value is less than 10, percentages were not calculated to avoid potentially misleading comparisons.

Responses, as summarized in **Table F-5**, varied depending on the function and region.

- Support was highest for allowing pharmacy technicians to independently destroy unserviceable narcotics and controlled substances without pharmacist participation, with 89% (132/148) of respondents in favour. This support was consistent across hospital types, bed sizes and regions, peaking at 96% in both smaller hospitals (50–200 beds; 51/53) and in the ATL region (25/26).
- For more clinically involved tasks, responses were more evenly divided. Overall, 51% (76/148) of respondents supported pharmacy technicians administering medications by injection or inhalation, with higher support from respondents in teaching hospitals (56%, 27/48), in the ATL region (69%, 18/26) and in BC (54%, 15/28) and 55% (29/53) in hospitals with 50-200 beds.
- Similarly, 50% (73/147) of respondents supported pharmacy technicians witnessing the ingestion of opioid replacement therapy, with notable support in QC (63%, 15/24) and the ATL region (65%,17/26); support was lower in AB (35%, 6/17) and ON (38%, 12/32).

- Support was lowest (though generally similar) for pharmacy technicians receiving verbal prescriptions for narcotics and controlled substances, with only 49% (72/148) of respondents in favour. Support varied markedly by region, being strong in the ATL region (81%, 21/26) and much lower in AB (17%, 3/18) and ON (28% (9/32).

- Overall, respondents from smaller hospitals (50–200 beds) tended to be slightly more supportive of expanded pharmacy technician roles relative to larger sites.

Although there was near-universal agreement on the safety and appropriateness of pharmacy technicians independently destroying unserviceable narcotics and controlled substances, reflecting confidence in their ability to manage secure and regulated tasks, support for broader clinical and operational roles remained more cautious and varied. This diversity could be related to concerns about training, regulatory frameworks, liability and traditional role boundaries within healthcare teams.

Approximately 50% of hospitals support expanded pharmacy technician roles, such as administering injections and taking verbal orders, which highlights growing recognition of their value, but adoption varies widely by region and hospital type.

The roughly 50% acceptance rate for tasks such as administering injections and witnessing ingestion of opioid replacement therapy suggests that many organizations recognize the potential benefits of expanding pharmacy technicians' scope of practice to improve workflow efficiency and patient care. Conversely, the variation in support by region and by hospital type could indicate lack of readiness or differing local policies and cultures affecting these decisions. Higher acceptance in teaching hospitals and in certain provinces may reflect better access to education and resources or the presence of progressive regulatory environments.

The observed variation in support for expanded pharmacy technician scope of practice highlights the importance of tailored implementation strategies that consider regional needs, hospital capabilities and stakeholder engagement. Efforts to standardize training, ensure robust competency assessments and clarify legal and professional responsibilities could help increase confidence and uptake of these expanded roles. Additionally, building interprofessional collaboration and communicating positive outcomes from pilot programs could further encourage adoption.

In summary, although destruction of narcotics by pharmacy technicians appears to be broadly encouraged, advancing clinical responsibilities in other areas will require thoughtful policy development, stakeholder buy-in and ongoing education.

Hospital Committee Roles for Pharmacy Technicians and Pharmacy Assistants

The 2023/24 survey included a new question asking whether pharmacy technicians and/or pharmacy assistants were involved with (and/or were members of) any hospital committees. The data showed that such participation was relatively low **(Table F-6)**, although responses indicated some engagement of technical personnel on medication safety and quality improvement committees.

Table F-6 Support for Pharmacy Technicians and/or Pharmacy Assistants to Participate in Committees, 2023/24

Are pharmacy technicians and/or pharmacy assistants involved with (and/or members of) any of the following hospital committees?			All	Bed Size			Hospital Type			Region					
				50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Medication Safety Committee	**Yes**	(n=)	(128)	(45)	(41)	(42)	(45)	(78)	(5)	(27)	(14)	(19)	(29)	(16)	(23)
			66	29	21	16	22	42	2	5	9	15	22	1	14
			52%	**64%**	**51%**	**38%**	**49%**	**54%**		**19%**	**64%**	**79%**	**76%**	**6%**	**61%**
Quality Improvement Committee	**Yes**	(n=)	(127)	(43)	(38)	(46)	(46)	(76)	(5)	(24)	(15)	(15)	(28)	(21)	(24)
			65	25	18	22	27	36	2	4	12	10	13	6	20
			51%	**58%**	**47%**	**48%**	**59%**	**47%**		**17%**	**80%**	**67%**	**46%**	**29%**	**83%**
Quality Assurance Committee	**Yes**	(n=)	(105)	(34)	(34)	(37)	(41)	(59)	(5)	(24)	(14)	(11)	(23)	(17)	(16)
			41	15	11	15	19	20	2	4	10	5	7	4	11
			39%	**44%**	**32%**	**41%**	**46%**	**34%**		**17%**	**71%**	**45%**	**30%**	**24%**	**69%**
Drug Diversion Prevention Committee	**Yes**	(n=)	(80)	(25)	(26)	(29)	(24)	(54)	(2)	(24)	(6)	(8)	(20)	(11)	(11)
			23	9	6	8	5	17	1	3	1	2	11	1	5
			29%	**36%**	**23%**	**28%**	**21%**	**31%**		**13%**			**55%**	**9%**	**45%**
Drugs and Therapeutics Committee	**Yes**	(n=)	(133)	(47)	(40)	(46)	(45)	(83)	(5)	(24)	(11)	(17)	(32)	(23)	(26)
			12	9	2	1	1	9	2	0	2	2	6	0	2
			9%	**19%**	**5%**	**2%**	**2%**	**11%**		**0**	**18%**	**12%**	**19%**	**0**	**8%**
Opioid Stewardship Committee	**Yes**	(n=)	(65)	(21)	(20)	(24)	(16)	(47)	(2)	(22)	(5)	(10)	(15)	(10)	(3)
			4	3	1	0	0	3	1	0	1	0	2	0	1
			6%	**14%**	**5%**	**0%**	**0%**	**6%**		**0%**		**0%**	**13%**	**0%**	
Antimicrobial Stewardship Committee	**Yes**	(n=)	(129)	(43)	(38)	(48)	(45)	(80)	(4)	(25)	(13)	(14)	(29)	(22)	(26)
			4	2	0	2	1	3	0	0	0	0	2	1	1
			3%	**5%**	**0%**	**4%**	**2%**	**4%**		**0%**	**0%**	**0%**	**7%**	**5%**	**4%**

Base: respondents, n = 133
When the n value is less than 10, percentages were not calculated to avoid potentially misleading comparisons.

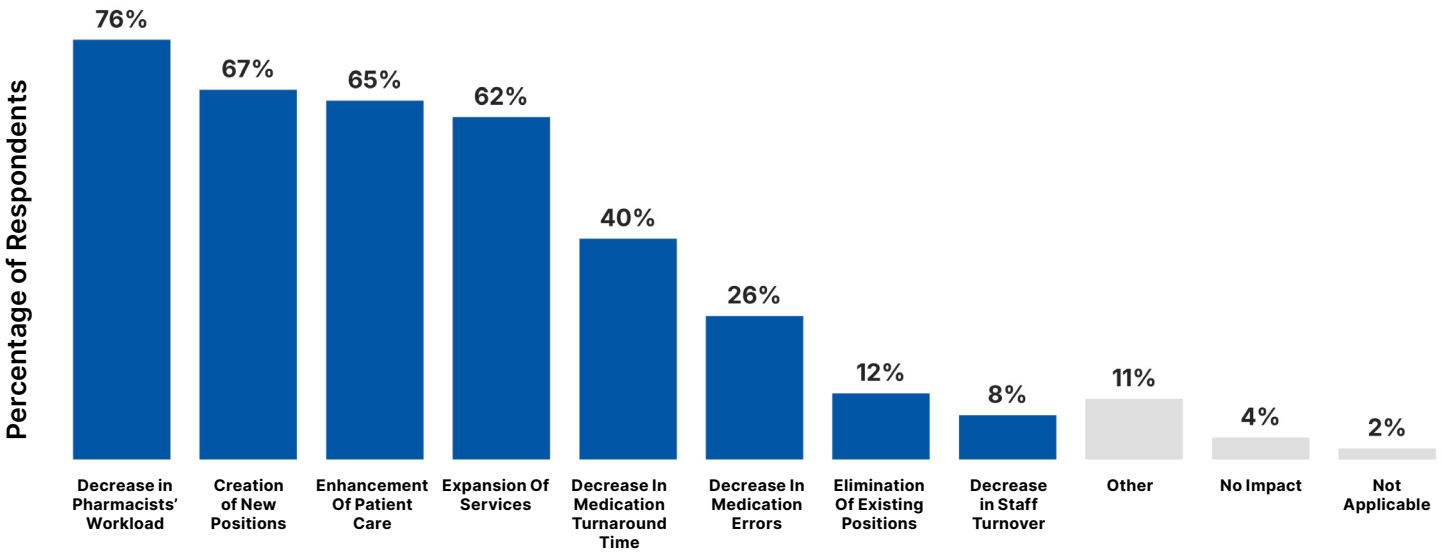
These results likely reflect a combination of structural, cultural and professional barriers. Pharmacy technicians and pharmacy assistants are often viewed as support staff rather than strategic contributors, particularly in the context of decision-making. Committee work is typically assumed to be the responsibility of pharmacists or pharmacist managers, while technicians' roles remain largely technical. Many hospitals lack formal policies encouraging participation of technical staff on interdisciplinary committees, and without structural support, invitations to engage are limited. Technicians and assistants may be unaware of these opportunities or may feel under-qualified, especially in the absence of mentorship or encouragement. Operational demands, limited backfill and the absence of committee work in stated job expectations further limit participation. Additionally, some pharmacy leaders do not actively promote the involvement of technical staff, leaving them overlooked in governance processes.

Although there is increasing recognition of the valuable insights that pharmacy technicians and pharmacy assistants can bring, especially to medication safety and quality initiatives, systemic and cultural barriers continue to limit their involvement on hospital committees. Greater inclusion will likely require intentional policy changes, leadership advocacy and efforts to redefine their roles as active contributors to patient safety and system improvement.

Impact of Pharmacy Technician Regulation on Healthcare Organizations

Data from the 2023/24 survey show that the regulation of pharmacy technicians has had a mostly positive impact on healthcare organizations **(Figure F-6)**.

Figure F-6 Impact of Pharmacy Technician Regulation on Organizations, 2023/24



Note: Total number of respondents=149

- Three-quarters (76%, 113/149) of respondents reported a decrease in pharmacists' workload, which indicates that pharmacy technicians are effectively freeing up pharmacists to focus more on complex clinical responsibilities, thus improving overall workflow efficiency.
    - A decrease in pharmacists' workload was reported most frequently in AB (89%, 16/18) and ATL (88%, 23/26), in non-teaching hospitals (77%, 73/95) and in smaller (50–200 beds) hospitals (85%, 45/53).

- Two-thirds (67%, 100/149) of respondents reported the creation of new positions, which suggests that regulation is driving workforce expansion and career development.
    - This effect was strongest in BC (82%, 23/28) and among facilities with > 500 beds (71%, 35/49).
- Almost two-thirds (65%, 97/149) of respondents reported enhancement of patient care, and 62% (93/149) noted expansion of services, thus demonstrating that pharmacy technicians are not only supporting the pharmacy workforce but also expanding its capacity to deliver patient-centred services.
    - Respondents from AB (89%, 16/18) and the ATL region (77%, 20/26) reported the highest level of care enhancements.
    - AB had the strongest level of service expansion (94%, 17/18).
- Less than half (40%, 60/149) of respondents reported a decrease in medication turnaround times, with the greatest frequencies in BC (64%, 18/28) and AB (56%, 10/18) and for facilities with 201–500 beds (55%, 26/47). The higher rates for this measure in certain provinces and in smaller and mid-sized hospitals, with lower impact in other provinces and in larger hospitals, may suggest potential gaps or under-utilization of pharmacy technicians in some settings.
- One-quarter (26%, 38/149) of respondents reported a reduction in medication errors, although this benefit appeared to be modest and inconsistent across regions.
- Only 12% (18/149) of respondents noted elimination of positions, and just 8% (12/149) reported a decrease in staff turnover, suggesting limited disruption to existing roles.
- A very small number of respondents (4%, 6/149) reported no impact of regulation, which indicates that the vast majority of facilities have experienced some benefit from regulation. As such, regulation supports workforce stability, not redundancy.

The data indicate that regulation has facilitated task redistribution, improved efficiency and expanded pharmacy service in many facilities.

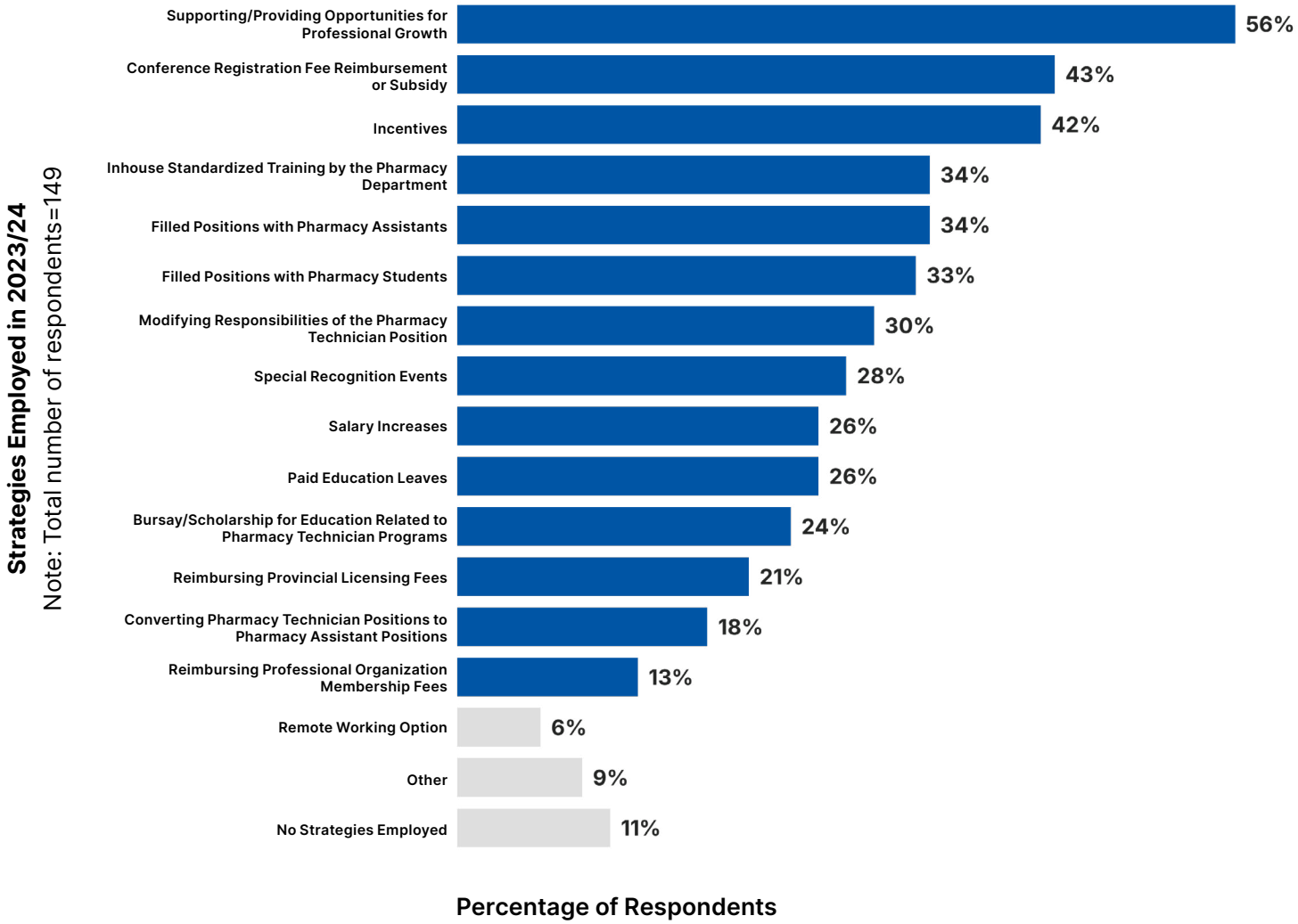
Most respondents reported positive impacts of pharmacy technician regulation, particularly in terms of freeing up pharmacists' time for clinical duties, with very few citing negative effects. Some reported no impact, perhaps due to delays in role integration or staffing limitations. Overall, it appears that regulation has allowed pharmacy technicians to take on greater responsibility in healthcare facilities.

Several respondents identified operational challenges associated with a staffing approach that prioritized filling vacancies exclusively with pharmacy technicians. To support the continued growth of pharmacy technicians' knowledge, skills, and abilities, investments in training and infrastructure must keep pace with service expansion. Regional disparities need to be addressed, with high-performing regions like AB and ATL serving as role models. Given the limited impact of pharmacy technician regulation on error reduction, targeted safety monitoring is also recommended. These insights reinforce the need for sustained investment in the development of the pharmacy technician role and workforce planning more generally.

Strategies to Address Pharmacy Technician Shortages

As exemplified by responses to the 2023/24 survey, hospitals across Canada have employed a range of strategies to address shortages of pharmacy technicians **(Figure F-7)**, with a focus on retention, recruitment and workforce development.

Figure F-7 Strategies Employed to Deal with Pharmacy Technician Shortages in 2023/24



The most popular strategies were supporting professional growth (56%, 83/149) and subsidizing conference fees (43%, 64/149), especially in the ATL region and BC. Financial incentives, such as recruitment, signing and retention bonuses, were reported by 42% (62/149) of respondents, with notably high adoption in ATL (100%, 26/26). Other widespread approaches included in-house pharmacy department training (34%, 51/149) and filling positions with pharmacy assistants (34%, 50/149) or pharmacy

students (33%, 49/149) to maintain service levels. Approximately one-third of respondents (30%, 44/149) reported modifying pharmacy technicians' responsibilities to create more flexibility.

Paid education leave (26%, 38/149) salary increases (26%, 39/149) and bursaries for pharmacy technician education (24%, 36/149) were reported less frequently but were more common in certain regions. Reimbursing licensing or membership fees and offering the option of remote work were rarely used.

Regional and institutional variation was evident, with the ATL region demonstrating the most proactive efforts in several categories.

Overall, the data show that although many organizations are investing in solutions to address pharmacy technician shortages, the response varies across regions and hospital types. The responses indicate creative and adaptive approaches to workforce challenges in many organizations, but they also highlight the importance of long-term solutions such as improving access to pharmacy technician training and licensure pathways.

Structured career progression for pharmacy technicians would boost retention, enhance efficiency, support expanding roles and align Canada with global standards.

The expansion of pharmacy technicians' scope of practice varies by province, with BC, AB and ON leading the way. In some jurisdictions, pharmacy technicians perform independent final checks of compounded and dispensed medications, conduct medication history interviews in emergency departments or at admission, supervise automation and drug distribution systems, and assist with narcotic audits and inventory control. Activities vary substantially by region and by facility, and it is clear that some healthcare facilities still under-utilize pharmacy technicians in clinical workflows.

To address pharmacy technician shortages, many hospitals have implemented strategies such as off-cycle salary increases, signing bonuses and professional development opportunities. Additionally, some have created non-technician job titles to enhance recruitment and retention.[7]

Pharmacy technicians often begin their careers in hospitals or community pharmacies with a focus on core support tasks. By viewing their career as a "jungle gym"[8] rather than a ladder, technicians can branch into fields like informatics, education, quality assurance and leadership, applying their skills in new ways and broadening their impact.

Pursuing opportunities such as cross-functional projects, certifications and networking helps technicians grow professionally and find fulfilling roles that benefit both patient care and the healthcare system.

Pharmacy leadership in Canada also has a valuable opportunity to leverage artificial intelligence (AI) technologies to address the ongoing shortages of pharmacy technicians and pharmacy assistants in hospital settings. By automating repetitive tasks, supporting clinical decision-making and streamlining workflows, AI can enhance the overall efficiency and effectiveness of the existing workforce. Tools such as robotic dispensing systems and image recognition for final product checks can reduce manual workload, allowing technicians to focus on higher-priority responsibilities. Additionally, AI can analyze

demand patterns and adjust inventory in real time, enabling technicians to dedicate more time to patient-centred care. Through predictive analytics, pharmacy leaders can make data-driven staffing decisions and strengthen the case for securing additional resources.[9]

Pharmacy technicians play a vital role in influencing decisions, guiding teams and shaping healthcare policy. Their hands-on experience and operational insights combine to offer a unique perspective that is crucial to optimizing workflows, enhancing patient care strategies and ensuring regulatory compliance. Pharmacy technicians are also well positioned to lead the implementation of new technologies, processes and systems, serving as catalysts for meaningful change across pharmacies and broader healthcare environments.[10]

Key Message for Pharmacy Technicians:
Pharmacy technicians should broaden their career perspectives beyond just upward moves and consider diverse roles within healthcare. By exploring lateral paths, embracing new challenges, and contributing their expertise, they can significantly impact patient care and advance the field.

Key Message for Pharmacy Leadership:
Pharmacy leaders should support technician growth by investing in advanced roles and creative career pathways and by integrating technicians into broader health initiatives.

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G - Technology

Alicia Wall

Innovations in healthcare-system and pharmacy-centric technologies are intended to enhance patient safety and health outcomes while improving the efficiency of delivering health services. This chapter outlines the state of health information systems integration across Canada relevant to hospital pharmacy practice, as revealed by the 2023/24 CSHP Hospital Pharmacy in Canada Survey, including the adoption of electronic health records (EHRs), the implementation and functionality of computerized provider order entry (CPOE) systems and the use of closed-loop medication management systems, as well as technologies such as barcoding and smart infusion pumps. It also provides insights into the human resources associated with developing and maintaining such systems. Finally, this chapter highlights technologies that are emerging on the Canadian hospital pharmacy landscape.

In terms of reporting regional data from the 2023/24 survey, the convention for the four eastern provinces (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and Newfoundland and Labrador [NL]) remains unchanged from prior reports, and these provinces are designated as the Atlantic region or ATL. Although Alberta (AB) did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system, it rejoined the survey for 2023/24. However, unlike reports up to 2016/17, in which AB, Saskatchewan (SK) and Manitoba (MB) were combined as the Prairie region, AB is now treated as a region distinct from the SK/MB combination.

Information Systems Integration

The Electronic Medical Record Adoption Model (EMRAM) of the Health Information and Management Systems Society measures clinical outcomes, patient engagement and clinicians' use of electronic medical record (also referred to as the electronic health record) technology to strengthen organizational performance and health outcomes across acute care inpatient populations. The EMRAM is the gold standard for rating the digital maturity of healthcare systems and hospitals around the world.[1]

The EMRAM classification of respondents' facilities **(Table G-1)** revealed the following highlights:

- Nearly half (40%, 58/145) of respondents' facilities were operating at EMRAM stage 3 or lower, predominantly in the SK/MB, Québec (QC) and ATL regions.
- Over a third (34%, 49/145) of respondents' facilities were operating at EMRAM stage 4 or higher, a substantial increase from 2020/21 (14%, 19/137).
- The small proportion of respondents (3%, 4/145) who indicated that their facilities were functioning at the highest EMRAM classification, stage 7, represents an increase from 1% (2/137) in 2020/21.

Table G-1 Classification of Respondents' Facilities According to Their Adoption of Various Technologies, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
HIMSS EMRAM Classification of Respondents' Facilities													
(n=)	(145)	(51)	(46)	(48)	(48)	(91)	(6)	(28)	(18)	(20)	(31)	(22)	(26)
Stage 0	1	0	0	1	0	1	0	0	0	0	0	1	0
	1%	**0%**	**0%**	**2%**	**0%**	**1%**		**0%**	**0%**	**0%**	**0%**	**5%**	**0%**
Stage 1	8	6	0	2	1	7	0	0	0	4	0	2	2
	6%	**12%**	**0%**	**4%**	**2%**	**8%**		**0%**	**0%**	**20%**	**0%**	**9%**	**8%**
Stage 2	33	12	9	12	17	15	1	5	0	7	1	10	10
	23%	**24%**	**20%**	**25%**	**35%**	**16%**		**18%**	**0%**	**35%**	**3%**	**45%**	**38%**
Stage 3	16	3	11	2	3	13	0	9	0	0	5	1	1
	11%	**6%**	**24%**	**4%**	**6%**	**14%**		**32%**	**0%**	**0%**	**16%**	**5%**	**4%**
Stage 4	3	0	2	1	2	1	0	0	0	1	2	0	0
	2%	**0%**	**4%**	**2%**	**4%**	**1%**		**0%**	**0%**	**5%**	**6%**	**0%**	**0%**
Stage 5	12	2	7	3	4	6	2	2	0	1	5	2	2
	8%	**4%**	**15%**	**6%**	**8%**	**7%**		**7%**	**0%**	**5%**	**16%**	**9%**	**8%**
Stage 6	30	8	11	11	12	17	1	1	18	0	11	0	0
	21%	**16%**	**24%**	**23%**	**25%**	**19%**		**4%**	**100%**	**0%**	**35%**	**0%**	**0%**
Stage 7	4	1	0	3	2	1	1	0	0	0	4	0	0
	3%	**2%**	**0%**	**6%**	**4%**	**1%**		**0%**	**0%**	**0%**	**13%**	**0%**	**0%**
Unknown	38	19	6	13	7	30	1	11	0	7	3	6	11
	26%	**37%**	**13%**	**27%**	**15%**	**33%**		**39%**	**0%**	**35%**	**10%**	**27%**	**42%**
Respondents with an Operational Electronic Health Record (EHR), 2023/24													
(n=)	(145)	(52)	(46)	(47)	(47)	(92)	(6)	(27)	(18)	(20)	(30)	(24)	(26)
Yes	99	32	37	30	36	59	4	24	18	6	28	7	16
	68%	**62%**	**80%**	**64%**	**77%**	**64%**		**89%**	**100%**	**30%**	**93%**	**29%**	**62%**
No	46	20	9	17	11	33	2	3	0	14	2	17	10
	32%	**38%**	**20%**	**36%**	**23%**	**36%**		**11%**	**0%**	**70%**	**7%**	**71%**	**38%**
Respondents with a Closed Loop Electronic Medication Administration System, 2023/24													
(n=)	(144)	(49)	(47)	(48)	(48)	(90)	(6)	(27)	(18)	(18)	(31)	(24)	(26)
Yes	46	13	16	17	16	27	3	5	18	0	22	1	0
	32%	**27%**	**34%**	**35%**	**33%**	**30%**		**19%**	**100%**	**0%**	**71%**	**4%**	**0%**
No	98	36	31	31	32	63	3	22	0	18	9	23	26
	68%	**73%**	**66%**	**65%**	**67%**	**70%**		**81%**	**0%**	**100%**	**29%**	**96%**	**100%**

Base: respondents to the question; EMRAM n = 145, EHR n = 145, Closed loop n = 144
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
EHR = electronic health record, EMRAM = Electronic Medical Record Adoption Model,
HIMSS = Health Information and Management Systems Society

Facilities' EMRAM classification was first requested in the 2020/21 survey, when the single health authority in AB was unable to participate due to data limitations related to active implementation of a standardized clinical information system. In the 2023/24 survey, 100% (18/18) of AB respondents reported operating at EMRAM stage 6, which led, in part, to an increase in the overall proportion of facilities at that level: 21% (30/145) in 2023/24 vs. 6% (8/137) in 2020/21. As such, comparisons with the previous survey should be interpreted with caution, although a substantial increase in facilities operating at stage 6 was also noted for Ontario (ON) (35%, 11/31) compared to 18% (7/39) in 2020/21.

Overall, these results indicate a trend toward greater adoption and optimization of electronic medical record technologies in Canada, including standardization of electronic records, integration of data and inter-operability to enhance clinical efficiency and outcomes. Nonetheless, more than a quarter of respondents (26%, 38/145) reported their facilities' EMRAM stage as unknown, which suggests that greater awareness among pharmacy leaders is needed.

Although the majority (68%, 99/145) of respondents reported use of an operational EHR system, there has been little change in EHR implementation in Canada since 2020/21 (65%, 91/140).

- In 2023/24, reported EHR adoption was highest in facilities with 201–500 beds (80%, 37/46) and in teaching facilities (77%, 36/47).
- On a regional basis, British Columbia (BC) (89%, 24/27), AB (100%, 18/18) and ON (93%, 28/30) led the way with EHR implementation.
- Uptake in the ATL region was mixed (62%, 16/26).
- The lowest EHR implementation was reported from QC (29%, 7/24) and SK/MB (30%, 6/20).

The relative stability of EHR use from 2020/21 to 2023/24 suggests that advancements in EMRAM stage, as discussed earlier, indicate optimization of EHR implementation and/or adoption of ancillary technologies.

Closed-loop electronic medication management systems seamlessly integrate aspects of the medication management process—from prescribing through dispensing to administration—to enhance safety and efficiency. The automation and integration of all five components of the medication system, specifically prescribing (via CPOE with decision support), transcription into a pharmacy information system (PIS) with decision support, dispensing (via product barcoding technology and automated dispensing cabinets [ADCs]), administration (via smart pumps and bedside barcoding for patients and medications) and monitoring, creates a closed-loop medication system, the gold standard of patient safety.[2] The 2023/24 survey represented the first assessment of implementation of closed-loop electronic medication management systems in Canada.

- Only 32% (46/144) of respondents reported the use of a closed-loop electronic medication management system.
- There did not appear to be any association between facility size or teaching status and the use of a closed-loop electronic medication management system.
- By far the greatest degree of implementation, on a regional basis, occurred in AB (100%, 18/18) and ON (71%, 22/31).

Outside of Alberta and Ontario, most respondents reported not using a closed-loop electronic medication management system.

Although closed-loop systems are less common in Canada than in other countries, they are the best way to promote safety and prevent medication errors.[3] Future iterations of the survey will continue to assess uptake of closed-loop electronic medication management systems across Canada.

The increasing complexity and sophistication of health information technology, including PIS, EHR, clinical applications, analytics tools and associated technologies, demand the availability of highly skilled individuals to support their optimal use in delivering safe and effective healthcare. Pharmacy informatics has grown to be an integral discipline within the clinical informatics domain, centred on the effective management and delivery of medication-related data, information and knowledge across systems that support the medication-use process.[4] The 2023/24 survey sought data on numbers and classifications of staff (in terms of budgeted full-time equivalents [FTEs]) dedicated to working on the PIS and any other pharmacy technology. It should be noted that pharmacy informatics resources in AB are managed at the provincial level; however, individual facilities participating in the survey provided differing responses on this topic; as such, the AB responses have been excluded from the following data analysis and are considered separately below.

Pharmacists continued to be the most common category of personnel working on the PIS and other pharmacy technologies (61%, 63/103), followed closely by pharmacy technicians **(Table G-2)**.

- For most categories of personnel, higher numbers of budgeted FTEs were reported for facilities with > 500 beds and for teaching hospitals.
- Higher pharmacist FTEs in this role were reported by respondents in BC and ON. Respondents most commonly (19%, 20/103) reported the number of pharmacist FTEs working on the PIS and other technologies as 1.0. The average for facilities where resources existed (excluding AB) was 1.7 FTEs.
- Pharmacy technicians and pharmacy assistants were reported to hold technological roles by 47% (44/93) and 35% (29/82) of respondents, respectively.
    - Higher pharmacy technician FTEs in this role were reported by respondents in BC and ON. Respondents most commonly (18%, 17/93) reported the number of pharmacy technician FTEs working on the PIS and other technologies as 1.0. The average for facilities where resources existed (excluding AB) was 1.4 FTEs.

- Pharmacy assistant FTEs in this role were reported more commonly by respondents in BC, QC and the ATL region. It should be noted that at the time of the 2023/24 survey, the title "pharmacy technician" did not exist in QC. Despite this, four respondents from QC reported FTEs in the pharmacy technician category and as such results should be interpreted with caution. Respondents most commonly (15%, 12/82) reported the number of pharmacy assistant FTEs working on the PIS and other technologies as 1.0. The average for facilities where resources existed (excluding AB) was 1.6 FTEs.

- Non-pharmacy personnel filled these technological roles in 31% (24/78) of facilities.
  - Respondents from all regions except SK/MB reported that non-pharmacy personnel worked on their PIS and other technologies. Respondents most commonly (8%, 6/78) reported the number of non-pharmacy personnel FTEs working on the PIS and other technologies as 1.0. The average for facilities where resources existed (excluding AB) was 2.1 FTEs.

Relative to the previous survey, these results represent a slight increase in pharmacy technicians (from 38% [47/123] in 2020/21), a slight decrease in pharmacy assistants (from 36% [45/124] in 2020/21) and a substantial increase in non-pharmacy personnel (from 19% [23/123] in 2020/21) reported to be working on the PIS and other pharmacy technologies.

Table G-2 Average Full-Time Equivalents (FTEs), by Position, Dedicated to Working on the Pharmacy Information System (PIS), 2023/24

	All	Bed Size			Hospital Type			Region				
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	SK/MB	ON	QC	ATL
(n=)	(34)	(5)	(8)	(21)	(16)	(18)	(0)	(4)	(3)	(9)	(14)	(4)
Pharmacist managers	**0.7**	**0.4**	**0.7**	**0.8**	**0.8**	**0.7**	**0.0**	**1.4**	**0.7**	**0.7**	**0.7**	**0.2**
(n=)	(63)	(11)	(22)	(30)	(24)	(35)	(4)	(13)	(5)	(18)	(18)	(9)
Pharmacists	**1.7**	**1.2**	**1.9**	**1.8**	**2.0**	**1.5**	**2.3**	**2.8**	**1.1**	**2.1**	**1.2**	**1.0**
(n=)	(7)	(1)	(4)	(2)	(3)	(4)	(0)	(1)	(2)	(1)	(0)	(3)
Pharmacy technician/ Pharmacy assistant managers	**0.4**	**0.2**	**0.6**	**0.2**	**0.2**	**0.6**	**0.0**	**0.3**	**0.6**	**1.0**	**0.0**	**0.2**
(n=)	(44)	(9)	(18)	(17)	(17)	(26)	(1)	(9)	(6)	(20)	(4)	(5)
Pharmacy technicians	**1.4**	**1.2**	**1.3**	**1.8**	**1.5**	**1.4**	**2.0**	**2.0**	**0.9**	**1.4**	**1.1**	**1.6**
(n=)	(29)	(3)	(7)	(19)	(14)	(15)	(0)	(4)	(4)	(0)	(16)	(5)
Pharmacy assistants	**1.6**	**1.7**	**1.3**	**1.7**	**1.2**	**2.0**	**0.0**	**1.5**	**0.9**	**0.0**	**1.8**	**1.4**
(n=)	(24)	(3)	(11)	(10)	(13)	(10)	(1)	(9)	(0)	(9)	(5)	(1)
Non-pharmacy personnel	**2.1**	**4.6**	**2.0**	**1.6**	**1.0**	**3.5**	**3.8**	**3.9**	**0.0**	**1.4**	**0.6**	**1.0**

Base: Respondents who indicated they had FTEs dedicated to working on the PIS in 2023/24, n=7–63

As noted above, inconsistencies in information supplied by AB respondents led to exclusion of this province from the foregoing data analysis. The unique nature of this province's single provincial health authority and the recent implementation of a comprehensive health information system developed and managed at the provincial level necessitate a substantial team of informatics resources. More specifically, the following personnel were dedicated to working on the AB PIS in 2023/24

- Pharmacist managers – 4 FTEs
- Pharmacists – 29 FTEs
- Pharmacy technicians – 22 FTEs
- Non-pharmacy personnel – 9 FTEs

No pharmacy technician/pharmacy assistant managers or pharmacy assistants worked on the PIS in AB in 2023/24.

Figure G-1 illustrates results grouped by fractions of FTEs and by personnel classification, again excluding data from AB.

- Pharmacists: 10% (10/103) of respondents employed 0.05 to 0.5 FTE to work on the PIS and other pharmacy technologies, 24% (25/103) employed 0.51 to 1.0 FTE, 11% (11/103) employed 1.1 to 2.0 FTEs, 9% (9/103) employed 2.1 to 3.0 FTEs, and 8% (8/103) employed more than 3.0 FTEs.
- Pharmacy technicians: 8% (7/93) of respondents employed 0.05 to 0.5 FTE for technological roles, 19% (18/93) employed 0.51 to 1.0 FTE, 18% (17/93) used 1.1 to 2.0 FTEs, and 2% (2/93) employed more than 3.0 FTEs.
- Pharmacy assistants: 4% (3/82) of respondents employed 0.05 to 0.5 FTE for technological roles, 16% (13/82) employed 0.51 to 1.0 FTE, 11% (9/82) employed 1.1 to 2.0 FTEs, 2% (2/82) employed 2.1 to 3.0 FTEs, and 2% (2/82) employed more than 3.0 FTEs.

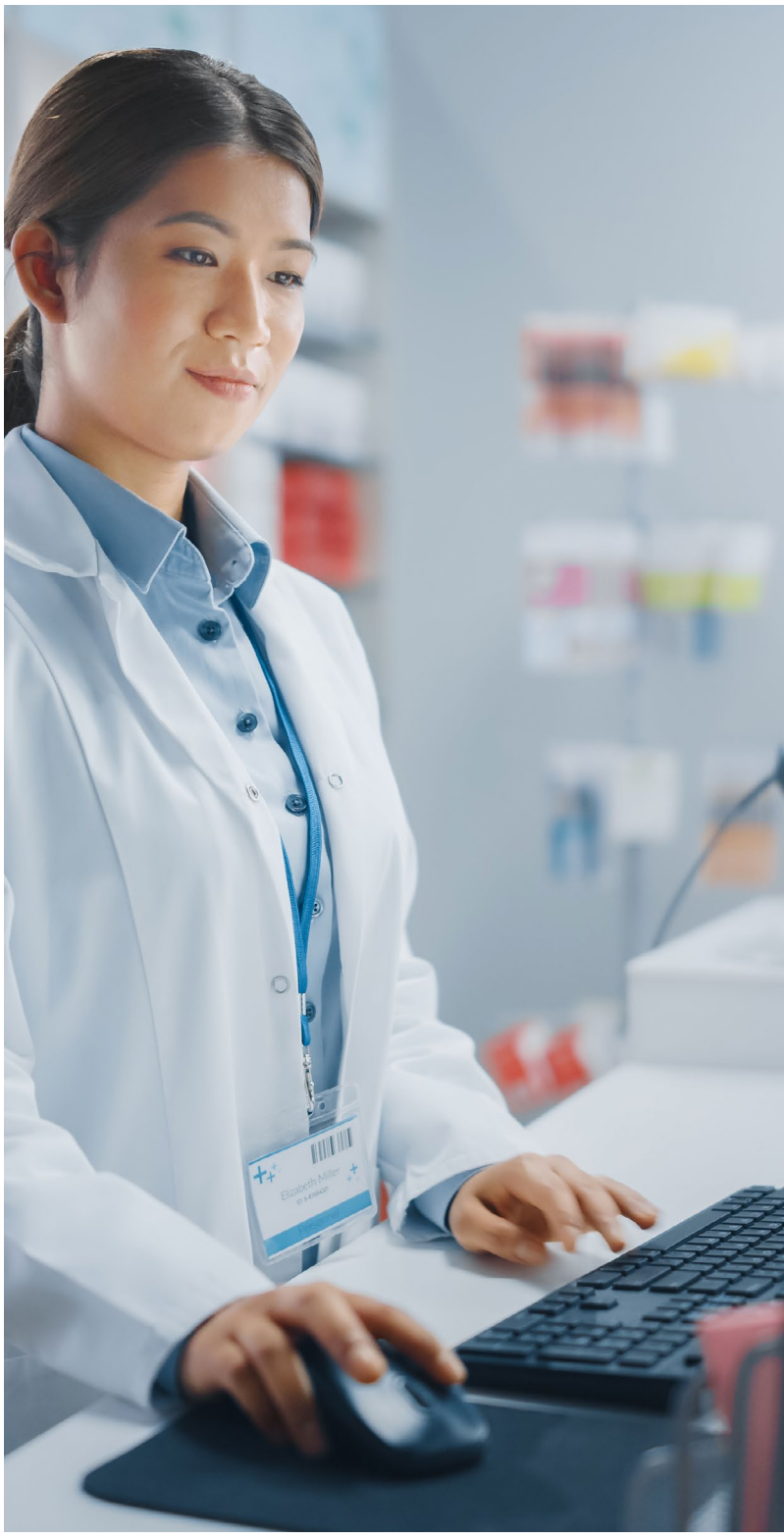
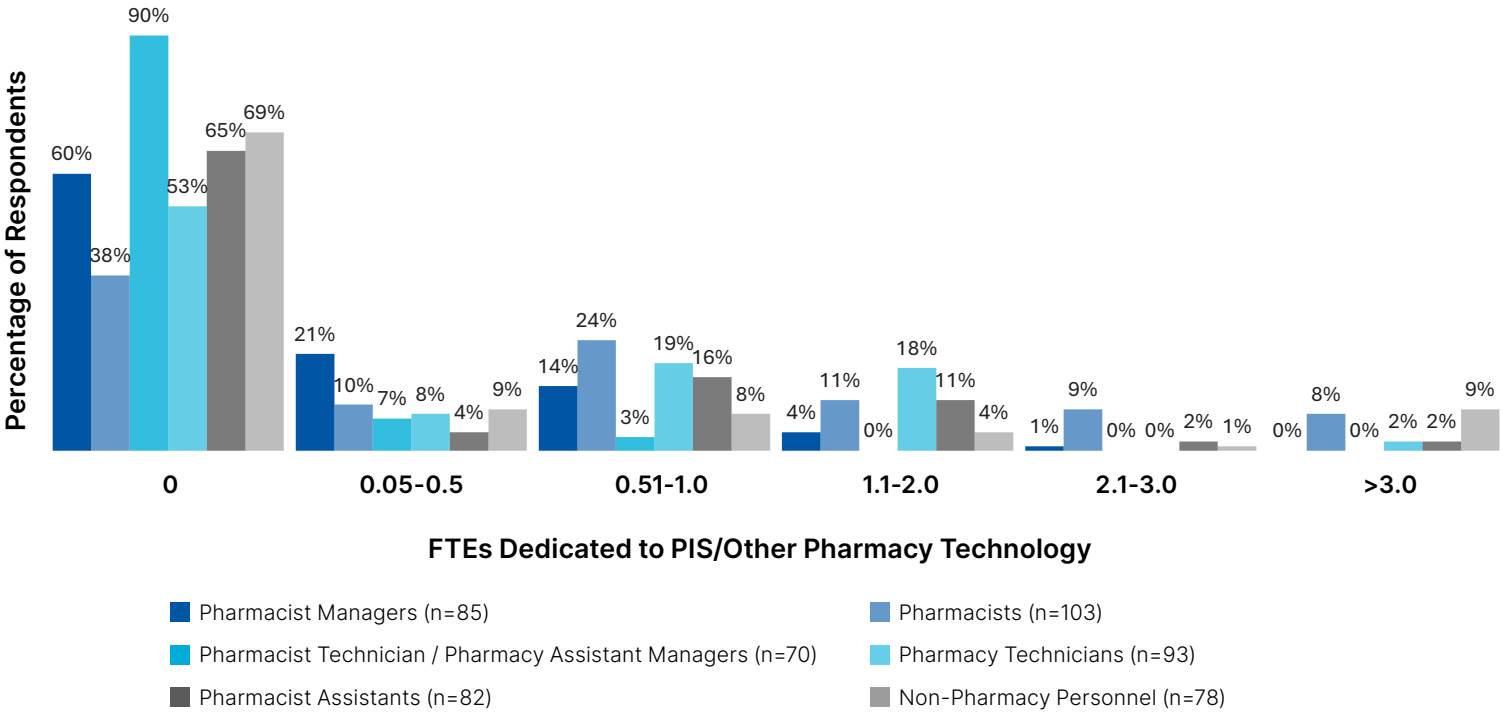


Figure G-1 Number of Full-Time Equivalents (FTEs), by Position, Dedicated to Working on the Pharmacy Information System (PIS) or Any Other Pharmacy Technology, 2023/24



Another aspect of information system integration relates to how pharmacy personnel obtain access to laboratory test results during the dispensing process and how alerts are generated concerning the need for potential changes in drug therapy based on these results **(Table G-3)**.

- The majority (55%, 82/149) of respondents reported accessing laboratory test results through a medication order entry system that was interfaced with the laboratory system but did not provide automated alerts concerning the need for potential changes in drug therapy. This model was reported by more than half of respondents from BC, QC and ATL and by almost half of respondents from ON.
- A smaller subset (31%, 46/149) of respondents indicated that laboratory test results were accessed through a medication order entry system that was fully interfaced with the laboratory system and did provide automated alerts of the need for potential changes in drug therapy. This model was in place province-wide in AB and in almost half of facilities in ON.
- Relatively few (14%, 21/149) respondents reported accessing laboratory test results through a separate login to a laboratory system that provided no alerts concerning the need for potential changes in drug therapy. This situation was most common in SK/MB (60%, 12/20).

It appears that the number of facilities using a system that automatically alerts practitioners about the need for potential changes to therapy has declined, from 44% (62/140) in 2020/21 to 31% (46/149) in 2023/24; however, changes in how the question was asked and in the response options in the 2023/24 survey

dictate caution in the interpretation of these results. Nonetheless, the overall proportion of respondents who reported a system that does not automatically alert users to the need for potential changes in drug therapy was substantial, at 69% (103/149), regardless of whether access was through a separate laboratory system login or through an interface with the medication order entry system.

Table G-3 Pharmacy Personnel Access to Laboratory Results, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Through the medication order entry system, with interfaced laboratory system but without automatic alerts to the practitioner	82 **55%**	28 **54%**	27 **57%**	27 **54%**	28 **58%**	50 **53%**	4	21 **75%**	0 **0%**	7 **35%**	16 **48%**	16 **67%**	22 **85%**
Through the medication order entry system, with fully interfaced laboratory system that automatically alerts practitioners about the need for potential changes in drug therapy	46 **31%**	12 **23%**	16 **34%**	18 **36%**	15 **31%**	30 **32%**	1	6 **21%**	18 **100%**	1 **5%**	16 **48%**	5 **21%**	0 **0%**
Through a separate login to a laboratory system (no alerts are provided)	21 **14%**	12 **23%**	4 **9%**	5 **10%**	5 **10%**	15 **16%**	1	1 **4%**	0 **0%**	12 **60%**	1 **3%**	3 **13%**	4 **15%**

Base: Respondents, n = 149
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Safety Initiatives: TALLman Lettering

The use of TALLman lettering is a best practice recommendation, not a mandatory requirement, and its use by hospital pharmacies across Canada is consistently increasing, as indicated by the data in **Table G-4**.

- Only one respondent (1%, 1/148) reported that their facility did not use TALLman lettering, compared with 6% (8/140) of respondents in 2020/21.
- The use of TALLman lettering has increased in all contexts surveyed, with the exception of pharmacy-generated medication administration records, where use of this safety initiative remained constant at 86% (114/132 in 2020/21 and 127/148 in 2023/24).
- The use of TALLman lettering in the medication rooms of patient care units increased substantially: 49%

(65/132) in 2020/21 vs. 70% (104/148) in 2023/24.

- Use of TALLman lettering also increased in the CPOE environment: 27% (35/132) in 2020/21 vs. 43% (64/148) in 2023/24.
- Although the use of TALLman lettering on medication carts (49%, 72/148) and in the CPOE environment (43%, 64/148) appears low relative to other contexts, these results could be due to these areas not being applicable to many respondents, given the high adoption of automated dispensing cabinets, in C - Drug Distribution Systems, and the relatively low use of CPOE, as discussed later in this chapter.

Table G-4 Use of TALLman Lettering, 2023/24

TALLman lettering used....	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(32)	(24)	(26)
On pharmacy-generated labels	147	52	47	48	47	94	6	28	18	20	32	23	26
	99%	**100%**	**100%**	**98%**	**98%**	**100%**		**100%**	**100%**	**100%**	**100%**	**96%**	**100%**
In the Pharmacy Information System (e.g., drop-down menus for drug selection)	143	51	44	48	45	92	6	27	18	20	30	23	25
	97%	**98%**	**94%**	**98%**	**94%**	**98%**		**96%**	**100%**	**100%**	**94%**	**96%**	**96%**
On pharmacy-generated unit-dose packaging	138	51	46	41	44	88	6	26	18	20	32	17	25
	93%	**98%**	**98%**	**84%**	**92%**	**94%**		**93%**	**100%**	**100%**	**100%**	**71%**	**96%**
On automated dispensing cabinets	134	47	42	45	47	81	6	23	18	16	30	21	26
	91%	**90%**	**89%**	**92%**	**98%**	**86%**		**82%**	**100%**	**80%**	**94%**	**88%**	**100%**
On clinical order sets or preprinted orders	132	48	42	42	41	85	6	27	18	18	28	17	24
	89%	**92%**	**89%**	**86%**	**85%**	**90%**		**96%**	**100%**	**90%**	**88%**	**71%**	**92%**
On pharmacy-generated medication administration records	127	43	39	45	42	80	5	27	18	10	28	23	21
	86%	**83%**	**83%**	**92%**	**88%**	**85%**		**96%**	**100%**	**50%**	**88%**	**96%**	**81%**
On shelf labels in the pharmacy	124	43	43	38	41	77	6	27	18	15	24	14	26
	84%	**83%**	**91%**	**78%**	**85%**	**82%**		**96%**	**100%**	**75%**	**75%**	**58%**	**100%**
In the medication rooms of patient care units (e.g., shelf labels)	104	38	35	31	33	66	5	25	18	12	15	12	22
	70%	**73%**	**74%**	**63%**	**69%**	**70%**		**89%**	**100%**	**60%**	**47%**	**50%**	**85%**

Table G-4 Use of TALLman Lettering, 2023/24 (Continued)

TALLman lettering used....	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
On medication carts	72	23	24	25	28	38	6	13	18	7	12	9	13
	49%	**44%**	**51%**	**51%**	**58%**	**40%**		**46%**	**100%**	**35%**	**38%**	**38%**	**50%**
Within the computerized provider order entry environment (if applicable)	64	18	24	22	21	39	4	10	17	3	22	8	4
	43%	**35%**	**51%**	**45%**	**44%**	**41%**		**36%**	**94%**	**15%**	**69%**	**33%**	**15%**
Not applicable (do not use)	1	0	0	1	1	0	0	0	0	0	0	1	0
	1%	**0%**	**0%**	**2%**	**2%**	**0%**		**0%**	**0%**	**0%**	**0%**	**4%**	**0%**

Base: Respondents, n = 148
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Safety Initiatives: Computerized Provider Order Entry

A recent systematic review demonstrated that the implementation of a CPOE system improves quality of care by reducing prescription and transcription errors and adverse drug events.[5] More specifically, CPOE systems with integrated clinical decision support prevent errors in the ordering and dispensing of medications by suggesting default values for drug doses, frequency and routes of administration and by alerting clinicians to drug allergies and to drug-drug and drug-laboratory interactions, as well as by preventing errors of omission.[6] However, it was also noted that use of CPOE can introduce new errors into the healthcare system, including communication errors, incorrect medication dosages and duplicate orders, attributable to factors such as system issues, lack of adherence to policies, lack of communication, inadequate medication reconciliation and lack of integration between the clinical decision support system and the CPOE system.[5] Findings on workload have been mixed, as CPOE has the ability to improve efficiency by through reducing manual tasks and preventing re-work, though it may also increase clinician workload and average time to fill a prescription. Although CPOE was reported by fewer than half of respondents to the 2023/24 survey **(Table G-5)**, its adoption continues to grow, and greater commitments to invest in CPOE systems were reported.

- The adoption of CPOE has doubled from the previous survey, with 39% (58/148) of respondents reporting use of CPOE compared to 19% (27/140) in 2020/21.
- For the majority (84%, 48/57) of respondents using CPOE, there was a bi-directional interface between the CPOE system and the PIS. The CPOE system was unidirectional (flowing to or from the PIS) in a few facilities (7%, 4/57), and there was no interface between the CPOE system and the PIS in a similar number of facilities (9%, 5/57), with medication orders transcribed directly into the PIS.
- CPOE systems were reported more often from teaching hospitals (47%, 22/47) than non-teaching hospitals (34%, 32/95), and four of the six pediatric hospitals had a CPOE system in 2023/24.

- The highest levels of CPOE adoption were in AB (100%, 18/18) and ON (73%, 24/33).
- Although adoption of CPOE was relatively low in BC (21%, 6/28), the use of CPOE in that province has increased since 2020/21 (15%, 4/26).
- Despite relatively little change in other regions, greater proportions of respondents from QC and ATL who did not currently have a CPOE system reported an approved plan to implement such a system. However, among respondents from SK/MB without a CPOE system, none were aware of an approved plan.

Of the 57 respondents who reported using CPOE, the most common features within the CPOE environment were alerting prescribers to unsafe medication orders during order entry (98%, 56/57), guiding the use of formulary drugs (96%, 55/57) and guiding the use of weight-based or body surface area–based dosing for selected drugs (96%, 55/57) **(Table G-6)**. Compared with 2020/21, respondents reported increasing integration with an EHR and increasing integration with a clinical decision support system that guides the user through established protocols and clinical pathways.

Although 68% (99/145) of respondents reported using an electronic health record, only 53% reported integration of the electronic health record with computerized provider order entry.

Table G-5 Implementation and Functionality of Computerized Provider Order Entry Systems (Excluding Outpatient Oncology Services), 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
CPOE implementation (excluding oncology)													
(n=)	(148)	(52)	(46)	(50)	(47)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(25)
Yes	58	15	22	21	22	32	4	6	18	3	24	4	3
	39%	**29%**	**48%**	**42%**	**47%**	**34%**		**21%**	**100%**	**15%**	**73%**	**17%**	**12%**
No	90	37	24	29	25	63	2	22	0	17	9	20	22
	61%	**71%**	**52%**	**58%**	**53%**	**66%**		**79%**	**0%**	**85%**	**27%**	**83%**	**88%**
No, and there is no approved plan to implement such a system	34	16	7	11	7	27	0	5	0	17	0	9	3
	23%	**31%**	**15%**	**22%**	**15%**	**28%**		**18%**	**0%**	**85%**	**0%**	**38%**	**12%**
No, but there is an approved plan to implement such a system	56	21	17	18	18	36	2	17	0	0	9	11	19
	38%	**40%**	**37%**	**36%**	**38%**	**38%**		**61%**	**0%**	**0%**	**27%**	**46%**	**76%**
CPOE functionality													
(n=)	(57)	(14)	(22)	(21)	(22)	(31)	(4)	(6)	(18)	(3)	(23)	(4)	(3)
CPOE system is interfaced bi-directionally with PIS (information flows back and forth between PIS and CPOE system) or functions as a single, integrated hospital information system requiring no interfaces	48	11	19	18	20	24	4	5	17	1	21	2	2
	84%	**79%**	**86%**	**86%**	**91%**	**77%**			**94%**		**91%**		
CPOE is not interfaced with PIS (medication orders are transcribed into pharmacy computer system)	5	3	1	1	1	4	0	0	1	2	1	1	0
	9%	**21%**	**5%**	**5%**	**5%**	**13%**			**6%**		**4%**		
CPOE system is interfaced unidirectionally with PIS (information flows only from CPOE system to PIS, or information flows only from PIS to CPOE system)	4	0	2	2	1	3	0	1	0	0	1	1	1
	7%	**0%**	**9%**	**10%**	**5%**	**10%**					**4%**		

Base: Respondents who reported CPOE implementation, n = 149. Respondents who reported functionality of their CPOE system, n = 57
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
CPOE = computerized provider order system, PIS = pharmacy information system

Table G-6 Features of the Computerized Provider Order Entry (CPOE) System, 2023/24

Features of the CPOE System	Bed Size				Hospital Type			Region					
	All	50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(57)	(14)	(22)	(21)	(22)	(31)	(4)	(6)	(18)	(3)	(23)	(4)	(3)
Alerts prescribers to unsafe orders (e.g., allergies, maximum doses, interactions) during order entry	56	14	22	20	21	31	4	6	18	3	23	3	3
	98%	**100%**	**100%**	**95%**	**95%**	**100%**			**100%**		**100%**		
Guides use of formulary drugs	55	14	20	21	21	30	4	6	18	2	22	4	3
	96%	**100%**	**91%**	**100%**	**95%**	**97%**			**100%**		**96%**		
Guides use of weight-based or surface area–based dosing for selected drugs (e.g., certain hazardous/cytotoxic oncology drugs) and/or patient populations (e.g., pediatric patients)	55	14	22	19	20	31	4	6	18	3	23	2	3
	96%	**100%**	**100%**	**90%**	**91%**	**100%**			**100%**		**100%**		
Integrated with electronic health records	52	13	22	17	19	29	4	6	18	2	23	1	2
	91%	**93%**	**100%**	**81%**	**86%**	**94%**			**100%**		**100%**		
Integrated with a clinical decision support system that guides user through established protocols and clinical pathways	48	12	17	19	19	25	4	6	18	0	20	3	1
	84%	**86%**	**77%**	**90%**	**86%**	**81%**			**100%**		**87%**		
Guides dosage determination of medications for special populations (e.g., patients with renal impairment, pediatric patients)	43	12	15	16	16	25	2	5	18	2	17	1	0
	75%	**86%**	**68%**	**76%**	**73%**	**81%**			**100%**		**74%**		
Interfaced with laboratory system to alert practitioners to need for potential changes in drug therapy	42	13	15	14	12	27	3	3	18	0	17	2	2
	74%	**93%**	**68%**	**67%**	**55%**	**87%**			**100%**		**74%**		
Other	2	0	1	1	2	0	0	0	0	1	0	1	0
	4%	**0%**	**5%**	**5%**	**9%**	**0%**			**0%**		**0%**		

Base: Respondents who reported features of their CPOE system, n = 57
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

In terms of which pharmacy personnel perform verification of medication orders entered into the CPOE system, the overwhelming majority of respondents reported that such orders were verified by a pharmacist (97%, 56/58). No respondents reported performance of order verification by pharmacy technicians.

Safety Initiatives: Smart Pumps

The introduction of smart infusion pumps has allowed for a greater level of control, accuracy, precision and safety with drug delivery, and these devices are designed to provide users with decision support for programmed doses and infusion rates to identify errors before medications or fluids are infused. In 2023/24, utilization of smart pumps was almost ubiquitous among respondents **(Table G-7)**.

- Nearly all respondents (98%, 146/149) reported using smart pumps, up from 93% (130/140) in 2020/21.
- Although the United States Institute for Safe Medication Practices (ISMP) recommends bi-directional smart pump inter-operability with the EHR,[7] this feature remained uncommon in Canada in 2023/24, with only 2% (3/144) of respondents reporting EHR integration.

Table G-7 Smart Pumps and Their Integration with the Electronic Health Record (EHR), 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Facility using smart pumps													
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Yes	146	52	45	49	48	92	6	27	18	20	33	22	26
	98%	**100%**	**96%**	**98%**	**100%**	**97%**		**96%**	**100%**	**100%**	**100%**	**92%**	**100%**
No	3	0	2	1	0	3	0	1	0	0	0	2	0
	2%	**0%**	**4%**	**2%**	**0%**	**3%**		**4%**	**0%**	**0%**	**0%**	**8%**	**0%**
Base: respondents, n = 149													
Smart Pumps are Integrated with EHR													
(n=)	(144)	(51)	(44)	(49)	(47)	(91)	(6)	(27)	(18)	(20)	(31)	(22)	(26)
Yes	3	0	1	2	1	2	0	1	0	0	2	0	0
	2%	**0%**	**2%**	**4%**	**2%**	**2%**		**4%**	**0%**	**0%**	**6%**	**0%**	**0%**
No	141	51	43	47	46	89	6	26	18	20	29	22	26
	98%	**100%**	**98%**	**96%**	**98%**	**98%**		**96%**	**100%**	**100%**	**94%**	**100%**	**100%**
Base: respondents, n = 144													

Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Designing, maintaining and using the smart pump drug library to prevent errors are foundational tasks; however, these were the most frequently reported challenges in a 2018 ISMP survey.[8] ISMP provides guidelines covering five aspects of infusion pump safety—infrastructure, drug library, continuous quality improvement data, clinical workflow and inter-operability.[8] There is considerable workload associated with developing, updating and maintaining smart infusion pump libraries and optimizing their safe use though continuous quality improvement. The 2023/24 survey asked how drug library development and maintenance are performed and the number of pharmacy FTEs dedicated to smart pump maintenance, as detailed in **Table G-8**.

- The majority of respondents reported that drug libraries were developed and maintained on a regional or provincial basis (32% [46/146] and 30% [44/146], respectively).
- For those facilities maintaining smart pumps at the local level, respondents reported resource allocation ranging from 0 to 1 FTE, with an average of 0.3 FTE. More than half (54%, 27/50) of these respondents indicated that no pharmacy resources were dedicated to smart pump maintenance.

Table G-8 Number of Full-Time Equivalents (FTEs) Dedicated to Smart Pump Maintenance at the Local/ Facility Level, 2023/24

FTEs	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(50)	(7)	(13)	(30)	(18)	(28)	(4)	(1)	(0)	(0)	(31)	(17)	(1)
0	27 **54%**	5	4 **31%**	18 **60%**	11 **61%**	14 **50%**	2	0	0	0	13 **42%**	14 **82%**	0
0.1	1 **2%**	1	0 **0%**	0 **0%**	0 **0%**	1 **4%**	0	0	0	0	1 **3%**	0 **0%**	0
0.2	2 **4%**	0	0 **0%**	2 **7%**	0 **0%**	2 **7%**	0	0	0	0	1 **3%**	1 **6%**	0
0.25	2 **4%**	0	2 **15%**	0 **0%**	2 **11%**	0 **0%**	0	0	0	0	2 **6%**	0 **0%**	0
0.3	3 **6%**	0	1 **8%**	2 **7%**	2 **11%**	1 **4%**	0	0	0	0	3 **10%**	0 **0%**	0
1	15 **30%**	1	6 **46%**	8 **27%**	3 **17%**	10 **36%**	2	1	0	0	11 **35%**	2 **12%**	1
Average	**0.3**	**0.2**	**0.5**	**0.3**	**0.2**	**0.4**	**0.5**	**1.0**	**0**	**0**	**0.4**	**0.1**	**1.0**
SD	0.4		0.5	0.4	0.4	0.5	0.6				0.5	0.3	

Base: respondents, n = 50
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Notably, because the survey did not gather information about pharmacy FTEs dedicated to regional or provincial maintenance of smart pumps, it is difficult to interpret actual resources dedicated to this important work across Canada.

Smart infusion pumps are almost universally used in Canada; however, most do not have bi-directional inter-operability with the electronic health record, as recommended by the Institute for Safe Medication Practices.

Safety Initiatives: Barcoding

Human error is a major cause of preventable medication error, contributing to increased adverse drug events and patient harm. The introduction of barcoding improves patient safety by reducing medication-related harm.[9] The adoption of a global bar code standard for medications and its application at the commercial production level enables medications to be safely and efficiently processed and documented along the entire pathway from manufacturer to pharmacy to patient administration.

Use of barcoding for medication administration is increasing in Canada but lags considerably behind the use of barcoding in hospital pharmacies.

The implementation of barcoding has been reported in the last three surveys (including 2023/24), with consistent increases in all areas reported in 2023/24. Nonetheless, there are opportunities to further increase adoption of barcoding outside of the pharmacy, including throughout the medication administration process. The extent of implementation throughout facilities is detailed in **Table G-9**.

- The majority (57%, 85/149) of respondents reported using barcoding to some extent to verify drug selection before dispensing from the pharmacy, whereas only 40% (59/149) of respondents reported the use of barcoding to verify drug selection before administration to a patient.
- Barcoding to identify the patient during medication administration was reported by 36% (54/149) of respondents and to identify the staff member during medication administration by 26% (39/149) of respondents. Three of the six pediatric hospitals reported use of barcoding to verify drug selection, the patient and the staff member during medication administration.
- Barcoding was commonly reported as being used to verify stocking of automated dispensing cabinets (83%, 123/148) and automated re-packaging machines (81%, 117/145), as well as for conducting inventory management (54%, 81/149), although the extent to which it was implemented for these tasks was variable.
- Although the majority (58%, 86/148) of respondents reported not using barcoding to verify base solutions and ingredients during preparation and verification of compounded sterile preparations, the proportion of respondents reporting use of barcoding for this task increased to 42% (62/148) from 21% (29/139) in 2020/21.
- Use of barcoding in the transfer of patient- and/or drug-specific information to smart pumps remained uncommon: 79% (117/148) of respondents reported not using barcoding for this task in 2023/24.

Table G-9 Barcoding, 2023/24

Uses of barcoding and extent of use	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Verify drug selection before dispensing from the pharmacy													
Yes, barcoding used for this application in 51%–100% of the facility	66 **44%**	13 **25%**	20 **43%**	33 **66%**	26 **54%**	36 **38%**	4	6 **21%**	18 **100%**	3 **15%**	19 **58%**	20 **83%**	0 **0%**
Yes, barcoding used for this application in ≤50% of the facility	19 **13%**	6 **12%**	3 **6%**	10 **20%**	8 **17%**	10 **11%**	1	3 **11%**	0 **0%**	2 **10%**	4 **12%**	3 **13%**	7 **27%**
No, facility does not use barcoding for this application	64 **43%**	33 **63%**	24 **51%**	7 **14%**	14 **29%**	49 **52%**	1	19 **68%**	0 **0%**	15 **75%**	10 **30%**	1 **4%**	19 **73%**
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Verify drug selection before administration to a patient													
Yes, barcoding used for this application in 51%–100% of the facility	53 **36%**	15 **29%**	20 **43%**	18 **36%**	18 **38%**	32 **34%**	3	7 **25%**	18 **100%**	0 **0%**	26 **79%**	2 **8%**	0 **0%**
Yes, barcoding used for this application in ≤50% of the facility	6 **4%**	2 **4%**	1 **2%**	3 **6%**	1 **2%**	5 **5%**	0	1 **4%**	0 **0%**	1 **5%**	1 **3%**	3 **13%**	0 **0%**
No, facility does not use barcoding for this application	90 **60%**	35 **67%**	26 **55%**	29 **58%**	29 **60%**	58 **61%**	3	20 **71%**	0 **0%**	19 **95%**	6 **18%**	19 **79%**	26 **100%**
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Identify the patient during medication administration													
Yes, barcoding used for this application in 51%–100% of the facility	52 **35%**	15 **29%**	20 **43%**	17 **34%**	18 **38%**	31 **33%**	3	6 **21%**	18 **100%**	0 **0%**	26 **79%**	1 **4%**	1 **4%**
Yes, barcoding used for this application in ≤50% of the facility	2 **1%**	1 **2%**	0 **0%**	1 **2%**	0 **0%**	2 **2%**	0	1 **4%**	0 **0%**	0 **0%**	1 **3%**	0 **0%**	0 **0%**
No, facility does not use barcoding for this application	95 **64%**	36 **69%**	27 **57%**	32 **64%**	30 **63%**	62 **65%**	3	21 **75%**	0 **0%**	20 **100%**	6 **18%**	23 **96%**	25 **96%**

Table G-9 Barcoding, 2023/24 (Continued)

Uses of barcoding and extent of use	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Identify the staff member during medication administration													
Yes, barcoding used for this application in 51%–100% of the facility	38	9	17	12	16	19	3	4	18	0	16	0	0
	26%	**17%**	**36%**	**24%**	**33%**	**20%**		**14%**	**100%**	**0%**	**48%**	**0%**	**0%**
Yes, barcoding used for this application in ≤50% of the facility	1	0	0	1	0	1	0	0	0	0	1	0	0
	1%	**0%**	**0%**	**2%**	**0%**	**1%**		**0%**	**0%**	**0%**	**3%**	**0%**	**0%**
No, facility does not use barcoding for this application	110	43	30	37	32	75	3	24	0	20	16	24	26
	74%	**83%**	**64%**	**74%**	**67%**	**79%**		**86%**	**0%**	**100%**	**48%**	**100%**	**100%**
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Conduct inventory management													
Yes, barcoding used for this application in 51%–100% of the facility	56	14	17	25	19	33	4	10	18	2	16	10	0
	38%	**27%**	**36%**	**50%**	**40%**	**35%**		**36%**	**100%**	**10%**	**48%**	**42%**	**0%**
Yes, barcoding used for this application in ≤50% of the facility	25	7	4	14	12	13	0	4	0	4	3	9	5
	17%	**13%**	**9%**	**28%**	**25%**	**14%**		**14%**	**0%**	**20%**	**9%**	**38%**	**19%**
No, facility does not use barcoding for this application	68	31	26	11	17	49	2	14	0	14	14	5	21
	46%	**60%**	**55%**	**22%**	**35%**	**52%**		**50%**	**0%**	**70%**	**42%**	**21%**	**81%**
(n=)	(147)	(51)	(47)	(49)	(47)	(94)	(6)	(28)	(17)	(20)	(33)	(24)	(25)
Verify filling of unit-dose bins													
Yes, barcoding used for this application in 51%–100% of the facility	52	12	16	24	19	30	3	7	17	3	12	13	0
	35%	**24%**	**34%**	**49%**	**40%**	**32%**		**25%**	**100%**	**15%**	**36%**	**54%**	**0%**
Yes, barcoding used for this application in ≤50% of the facility	17	2	3	12	7	10	0	6	0	1	4	3	3
	12%	**4%**	**6%**	**24%**	**15%**	**11%**		**21%**	**0%**	**5%**	**12%**	**13%**	**12%**
No, facility does not use barcoding for this application	78	37	28	13	21	54	3	15	0	16	17	8	22
	53%	**73%**	**60%**	**27%**	**45%**	**57%**		**54%**	**0%**	**80%**	**52%**	**33%**	**88%**

Table G-9 Barcoding, 2023/24 (Continued)

Uses of barcoding and extent of use	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(52)	(46)	(50)	(47)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(25)
Verify stocking of automated dispensing cabinets													
Yes, barcoding used for this application in 51%–100% of the facility	109	38	32	39	38	65	6	12	18	13	28	17	21
	74%	**73%**	**70%**	**78%**	**81%**	**68%**		**43%**	**100%**	**65%**	**85%**	**71%**	**84%**
Yes, barcoding used for this application in ≤50% of the facility	14	4	7	3	6	8	0	4	0	2	3	1	4
	9%	**8%**	**15%**	**6%**	**13%**	**8%**		**14%**	**0%**	**10%**	**9%**	**4%**	**16%**
No, facility does not use barcoding for this application	25	10	7	8	3	22	0	12	0	5	2	6	0
	17%	**19%**	**15%**	**16%**	**6%**	**23%**		**43%**	**0%**	**25%**	**6%**	**25%**	**0%**
(n=)	(145)	(50)	(46)	(49)	(45)	(94)	(6)	(28)	(17)	(20)	(33)	(23)	(24)
Verify stocking of automated re-packaging machines													
Yes, barcoding used for this application in 51%–100% of the facility	107	35	32	40	38	63	6	8	17	14	27	22	19
	74%	**70%**	**70%**	**82%**	**84%**	**67%**		**29%**	**100%**	**70%**	**82%**	**96%**	**79%**
Yes, barcoding used for this application in ≤50% of the facility	10	1	4	5	3	7	0	4	0	0	2	1	3
	7%	**2%**	**9%**	**10%**	**7%**	**7%**		**14%**	**0%**	**0%**	**6%**	**4%**	**13%**
No, facility does not use barcoding for this application	28	14	10	4	4	24	0	16	0	6	4		2
	19%	**28%**	**22%**	**8%**	**9%**	**26%**		**57%**	**0%**	**30%**	**12%**		**8%**
(n=)	(148)	(52)	(47)	(49)	(48)	(94)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
Verify base solutions and ingredients during preparation and verification of compounded sterile preparations													
Yes, barcoding used for this application in 51%–100% of the facility	50	11	19	20	16	30	4	6	18	1	12	8	5
	34%	**21%**	**40%**	**41%**	**33%**	**32%**		**21%**	**100%**	**5%**	**36%**	**35%**	**19%**
Yes, barcoding used for this application in ≤50% of the facility	12	3	5	4	6	6	0	1	0	3	3	1	4
	8%	**6%**	**11%**	**8%**	**13%**	**6%**		**4%**	**0%**	**15%**	**9%**	**4%**	**15%**
No, facility does not use barcoding for this application	86	38	23	25	26	58	2	21	0	16	18	14	17
	58%	**73%**	**49%**	**51%**	**54%**	**62%**		**75%**	**0%**	**80%**	**55%**	**61%**	**65%**

Table G-9 Barcoding, 2023/24 (Continued)

Uses of barcoding and extent of use	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(52)	(47)	(49)	(47)	(95)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
Transfer patient- and/or drug- specific information to smart pump													
Yes, barcoding used for this application in 51%–100% of the facility	28 **19%**	8 **15%**	11 **23%**	9 **18%**	12 **26%**	13 **14%**	3	3 **11%**	18 **100%**	0 **0%**	4 **12%**	0 **0%**	3 **12%**
Yes, barcoding used for this application in ≤50% of the facility	3 **2%**	1 **2%**	1 **2%**	1 **2%**	1 **2%**	2 **2%**	0	1 **4%**	0 **0%**	0 **0%**	1 **3%**	0 **0%**	1 **4%**
No, facility does not use barcoding for this application	117 **79%**	43 **83%**	35 **74%**	39 **80%**	34 **72%**	80 **84%**	3	24 **86%**	0 **0%**	20 **100%**	28 **85%**	23 **100%**	22 **85%**

Base: n=145-149 respondents
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Safety Initiatives: Standard Nomenclature for Medications

The use of standard nomenclature to describe the forms of various medications (such as sustained release [SR], controlled delivery [CD] or extended release [XR] for slow-release dosage forms) was reported by 84% (125/148) of respondents **(Table G-10)**, an increase from 2020/21 (63%, 87/139). However, the wording of the question about nomenclature was changed for the 2023/24 survey, and respondents were not specifically asked whether standard nomenclature was used in information systems, as in previous survey iterations. As such, respondents may have interpreted the question as applying more broadly, including contexts such as shelf labels in the pharmacy. Comparisons to previous survey results should therefore be interpreted with caution.

- The reported use of standard nomenclature was highest in facilities with 201–500 beds (96%, 45/47) and in teaching hospitals (89%, 42/47). All six pediatric hospitals reported the use of standard nomenclature.
- The reported use of standard nomenclature was consistently high in BC (100%, 28/28), AB (100% 18/18) and ON (97%, 32/33) and increased substantially in QC, from 26% (9/35) in 2020/21 to 70% (16/23) in 2023/24.

Table G-10 Use of Standard Nomenclature for Medications, 2023/24

	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(148)	(51)	(47)	(50)	(47)	(95)	(6)	(28)	(18)	(20)	(33)	(23)	(26)
Yes	125	38	45	42	42	77	6	28	18	14	32	16	17
	84%	**75%**	**96%**	**84%**	**89%**	**81%**		**100%**	**100%**	**70%**	**97%**	**70%**	**65%**
No	23	13	2	8	5	18	0	0	0	6	1	7	9
	16%	**25%**	**4%**	**16%**	**11%**	**19%**		**0%**	**0%**	**30%**	**3%**	**30%**	**35%**

Base: n = 148 respondents
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Emerging Technologies

The survey asked about the adoption of new and innovative technologies by Canadian hospital pharmacies in 2023/24. Results are detailed in **Table G-11**.

- Fewer respondents reported the scanning of medication orders and secure transmission to a pharmacist at a remote location for review in 2023/24 (52%, 77/149) than in 2020/21 (59%, 83/140). This decrease may be attributable to the increased adoption of CPOE interfaced bi-directionally with the PIS, as discussed earlier in this chapter.

- Fewer respondents reported the use of telecare (consultations or services for patients in other healthcare facilities or at home) in 2023/24 (25%, 37/149) than in 2020/21 (33%, 46/140). This result is surprising, given the shift to telecare necessitated by the COVID-19 pandemic and perceptions of the ability of telecare to improve efficiency and patient access. This trend was not consistent across the country, with the greatest decrease reported in ON (15% [5/33] in 2023/24 vs. 31% [12/39] in 2020/21) and a substantial increase reported in QC (71% [17/24] in 2023/24 vs. 63% [22/35] in 2020/21).

- Reported advances in the adoption of technologies for sterile compounding suggest that this is the area of greatest growth in terms of pharmacy adoption of emerging technologies, with 48% (72/149) of respondents reporting use of cameras to manage sterile compounding workflows and 20% (30/149) reporting use of gravimetry-based sterile compounding workflows. These data contrast with 37% (52/140) and 10% (14/140) of respondents, respectively, reporting use of these technologies in 2020/21. Some respondents commented on their use of robotics in sterile compounding, which will be an area for further exploration in future surveys.

Canadian hospitals pharmacies are increasingly adopting innovative technologies to support the safety and efficiency of sterile compounding.

- Marginal increases were observed in reporting of carousel systems (18%, 27/149) and radio frequency identification (18%, 27/149) to support pharmacy inventory management, compared with 16% (22/140) and 14% (20/140), respectively, in 2020/21.

- Artificial intelligence in pharmacy practice remains uncommon and represents an area for future growth, with only 3% (4/149) of respondents reporting use of this technology in 2023/24. These four pioneering hospitals were non-teaching facilities with at least 201 beds, located in ON (2/4) and QC (2/4).

Table G-11 Emerging Technologies in Use, 2023/24

Technology in use in the facility	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
(n=)	(149)	(52)	(47)	(50)	(48)	(95)	(6)	(28)	(18)	(20)	(33)	(24)	(26)
Fluid transfer pump: Sterile compounding device (for both hazardous or non-hazardous products) for fluid transfer and filling, such as drug reconstitution, IV fill and transfer, elastomeric infuser fills, total parenteral nutrition, filling of sterile syringes	86	14	31	41	35	45	6	13	11	6	21	24	11
	58%	**27%**	**66%**	**82%**	**73%**	**47%**		**46%**	**61%**	**30%**	**64%**	**100%**	**42%**
Medication order management: Scanning of medication orders and secure transmission to a pharmacist at a remote location for review	77	29	20	28	23	50	4	15	3	12	10	22	15
	52%	**56%**	**43%**	**56%**	**48%**	**53%**		**54%**	**17%**	**60%**	**30%**	**92%**	**58%**
Camera-based remote verification: Use of camera to manage workflow of compounding of sterile preparations and permitting remote verification and documentation of activities by authorized personnel outside the sterile room or from a remote facility	72	20	20	32	26	42	4	6	13	5	14	23	11
	48%	**38%**	**43%**	**64%**	**54%**	**44%**		**21%**	**72%**	**25%**	**42%**	**96%**	**42%**
Telecare: Consultations or services for patients in other healthcare facilities or at home	37	5	8	24	17	18	2	5	4	3	5	17	3
	25%	**10%**	**17%**	**48%**	**35%**	**19%**		**18%**	**22%**	**15%**	**15%**	**71%**	**12%**
Gravimetry-based IV workflow: Software and equipment used for compounding of sterile preparations	30	4	9	17	9	19	2	3	1	1	6	13	6
	20%	**8%**	**19%**	**34%**	**19%**	**20%**		**11%**	**6%**	**5%**	**18%**	**54%**	**23%**
Carousel: Automated storage and dispensing system for pharmacy inventory, which may feature vertical storage capacity, barcode scanning, and ambient or refrigerated storage	27	3	9	15	14	10	3	5	0	1	11	7	3
	18%	**6%**	**19%**	**30%**	**29%**	**11%**		**18%**	**0%**	**5%**	**33%**	**29%**	**12%**

Table G-11 Emerging Technologies in Use, 2023/24 (Continued)

Technology in use in the facility	All	Bed Size			Hospital Type			Region					
		50-200	201-500	>500	Teaching	Non-teaching	Pediatric	BC	AB	SK/MB	ON	QC	ATL
Radio frequency identification (RFID): Use of RFID tags on devices, kits or trays used to administer or store medications	27	4	13	10	7	18	2	13	0	0	11	1	2
	18%	**8%**	**28%**	**20%**	**15%**	**19%**		**46%**	**0%**	**0%**	**33%**	**4%**	**8%**
Artificial intelligence: Electronic, robotic or virtual systems that employ human-created algorithms, machine-learning or deep learning	4	0	1	3	0	3	1	0	0	0	2	2	0
	3%	**0%**	**2%**	**6%**	**0%**	**3%**		**0%**	**0%**	**0%**	**6%**	**8%**	**0%**

Base: Respondents, n = 149
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons
IV = intravenous

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H - Hot Topics in 2023/24

Spencer Tuttle and Allan Mills

The Hot Topics chapter highlights how pharmacy departments in both large and small hospitals are responding to pressing challenges related to the environment, emergency preparedness, digital transformation and disruptions in the pharmaceutical supply chain.

Increasingly, pharmacy departments are examining their operational practices through a climate-conscious lens—adopting waste reduction strategies, aligning with organizational sustainability goals and considering the environmental impact of medication use and packaging. These efforts are gaining traction as the health sector intensifies its response to climate change.

Another critical area is disaster preparedness and mitigation. Data from the 2023/24 CSHP Hospital Pharmacy in Canada Survey provide insights into how facilities are planning for natural disasters and other large-scale emergencies, including whether pharmacy services are integrated into broader emergency management strategies. Data on continuity plans and staffing models reveal important variations in preparedness across regions and facility types.

In parallel, the expanding use of artificial intelligence (AI) and heightened awareness of cyberattack risks are reshaping how hospitals approach both innovation and security. The 2023/24 survey report examines how AI is beginning to influence medication management and workflow optimization, while also exploring how facilities are safeguarding digital infrastructure and patient data from emerging cybersecurity threats.

Finally, the management of drug shortages remains a persistent concern nationally and globally. The survey data shed light on how facilities are responding to ongoing supply challenges through enhanced inventory management, collaborative procurement practices, and efforts to anticipate and mitigate disruptions. These findings illustrate both the operational pressures faced by pharmacy departments and the innovative approaches being used to maintain continuity of care.

Together, these four themes illustrate how hospital pharmacy is adapting to complex and evolving system demands; they also offer insights into current practices and future directions across the country.

Environmental Sustainability

Against a backdrop of multiple intersecting pressures, environmental sustainability has emerged as a priority area for hospital pharmacy practice. With growing recognition of the healthcare sector's contribution to environmental harm, as detailed below, facilities are examining how pharmacy operations—particularly those related to waste, packaging and energy-intensive processes—can be aligned with broader climate goals.

The Canadian healthcare system is responsible for an estimated 4.6% of national greenhouse gas (GHG) emissions, with pharmaceuticals alone contributing approximately 25% of those emissions.[1] These figures underscore the essential role of hospital pharmacy in addressing climate change. Environmental sustainability is no longer optional in healthcare, and time is of the essence. With growing recognition of the sector's carbon footprint and the burden of pharmaceutical waste, hospital pharmacy departments are increasingly expected to align their operations with organizational climate action. The 2023/24 survey report offers a snapshot of pharmacy's engagement with environmental priorities across Canada, showing how hospital pharmacies are uniquely positioned to both drive sustainability and provide environmentally responsible healthcare by influencing product selection, distribution practices, waste reduction and interdepartmental collaboration. The 2023/24 survey examined the extent to which pharmacy departments are advancing environmental priorities, seeking responses through both the large hospital survey (LHS, for facilities with at least 50 acute care beds) and the small hospital survey (SHS, for facilities with < 50 acute care beds).

Organizational Strategic Plans and Environmental Sustainability

Among the LHS respondents, 46% (68/149) reported that their organization's strategic plan included an environmental sustainability initiative, while 22% (33/149) had an environmental sustainability plan in development. Inclusion of environmental sustainability in strategic planning was highest, in terms of hospital type, among pediatric hospitals (5/6), while the leaders on a provincial basis were Québec (QC) (79%, 19/24) and British Columbia (BC) (68%, 19/28).

Among the SHS respondents, only 36% (80/220) reported integration of environmental sustainability into their organizations' strategic plans, and an additional 22% (49/220) had an environmental sustainability plan underway. Regional variation was striking: 81% (60/74) of SHS respondents in Alberta (AB) but only 18% (6/34) of those in BC had an environmental sustainability plan.

These findings reveal mixed progress. While some jurisdictions have made strong efforts in this area, a notable proportion of respondents still lack formal commitments, suggesting that policy direction at the health organization or provincial level may be a necessary key enabler.

Pharmacy Department Strategic Plans and Environmental Sustainability

Only 24% (36/149) of LHS respondents reported that their pharmacy department's strategic plan included an environmental sustainability initiative. An additional 29% (43/149) reported that plans for such an initiative were in progress, while the remaining nearly half (47%, 70/149) reported no environmental

sustainability initiatives at all. The gap was even wider among the SHS respondents: just 4% (8/222) of respondents reported pharmacy-specific sustainability initiatives within their departmental strategic plans, although an additional 23% (51/222) reported that such planning was underway.

The discrepancy between organizational and departmental planning suggests that even where environmental sustainability is a hospital-wide priority, pharmacy departments may lack the mandate, support or resources to take independent action. As previously noted, given the significant proportion of healthcare-generated GHG emissions that can be attributed to pharmacy, there is a massive opportunity to take a leadership role in this important area—a call to action for pharmacy leadership nationally.

Pharmacy Department Environmental Mitigation Strategies

Nearly every respondent to both versions of the 2023/24 survey reported that they had adopted at least one sustainability initiative, reflecting broad awareness of pharmacy's role in environmental health.

- LHS: 98% (145/148)
- SHS: 95% (212/222)

More specifically, the survey asked respondents to report on their adoption of 12 environmental mitigation strategies. Results for the LHS and SHS respondents are compared in **Table H-1**.

Nearly all respondents reported implementing at least one pharmacy-led environmental mitigation strategy.

Table H-1 Adoption of Specific Environmental Mitigation Strategies by Pharmacy Departments, 2023/24

Mitigation Strategy	Large Hospital Survey	Small Hospital Survey
Recycling programs	**86%** (126/146)	**69%** (152/221)
Reuse of returned drugs	**86%** (128/148)	**86%** (198/231)
Tamper-tape on multi-dose products	**79%** (117/148)	**70%** (154/220)
Reduction of report printing	**63%** (92/147)	**71%** (156/221)
Reusable bins or bags	**53%** (79/148)	**67%** (147/221)
Paper bags for dispensing	**41%** (61/148)	**29%** (64/220)
Green Team	**17%** (25/148)	**1%** (2/230)
Collaboration with anesthesiology	**46%** (68/148)	**17%** (37/221)
Inhaler-related initiatives (e.g., dry powder inhalers)	**40%** (59/147)	**25%** (57/229)
Reduction of transfer-related medication waste	**59%** (87/147)	**64%** (141/221)
Adjustment of inventory turns	**41%** (60/148)	**66%** (146/221)
Reuse of hazardous/sharps containers	**29%** (43/147)	**24%** (55/231)

Base: All respondents to this question in the LHS and SHS

Recycling, reuse of returned drugs and tamper-tape application were the most common strategies already adopted across both large and small hospitals. Small hospitals outperformed large hospitals in areas where environmental initiatives aligned with operational efficiency, such as reducing printing and optimizing inventory turnover. These results suggest that even resource-limited facilities can lead sustainability efforts when interventions double as cost-saving measures.

Green Teams and partnerships with anesthesiology were far less common (although a substantial proportion [16%, 24/148] of LHS respondents reported plans for a Green Team, and 21% [31/147] reported plans for inhaler-related initiatives). Yet these represent powerful opportunities for system-wide impact and pharmacy leadership in environmental sustainability. Desflurane, a widely used inhalational anesthetic, has a global warming potential more than 2,500 times that of carbon dioxide and a long atmospheric half-life.[2] Replacing desflurane with sevoflurane or total intravenous anesthesia, which have comparable clinical effectiveness, results in substantial GHG reductions with minimal clinical trade-offs.[3] Pharmacy departments have an important role in facilitating these anesthetic gas substitutions.

Although collaboration with anesthesiology is essential to eliminate the use of desflurane (an anesthetic with a global warming potential 2,500 times greater than that of CO_2), only 46% (68/148) of SGH respondents and 17% (37/221) of SPH respondents reported having such collaboration in place.

Labelling Multi-Dose Medications for Discharge

Policies mandating appropriate labelling and dispensing of multi-dose medications at the time of discharge were reported by 36% (54/148) of LHS respondents and 57% (126/222) of SHS respondents. This practice supports waste reduction and patient continuity of care at this critical transition of care. Smaller facilities may be leading in this area due to simpler discharge processes or fewer procedural barriers.

Designated Pharmacy Personnel for Environmental Sustainability

Only 24% (35/148) of LHS respondents and a meagre 2% (5/231) of SHS respondents reported the presence of pharmacy staff focused on environmental sustainability. Among those facilities with designated personnel, median weekly time reported to be spent on this type of activity was 1.5 hours by LHS respondents and 1 hour by SHS respondents.

Research suggests that dedicated leadership is a critical enabler of sustainability progress in healthcare organizations. In their recent article, MacNeill and others emphasized that institutional change is most successful when individuals or teams are explicitly empowered to lead green initiatives to transform culture towards resource stewardship.[4] Without dedicated personnel or protected time, departments are unlikely to move beyond isolated interventions or pilot projects.

Barriers to Implementation

The overarching theme of responses to a question about barriers to implementation of green initiatives was lack of resources.

- The barrier most frequently cited by respondents was lack of time (LHS, 89% [132/148]; SHS, 85% [197/232]).
- Other notable barriers were lack of funding, lack of leadership and lack of engagement.

Although resource constraints are ever-present in the Canadian healthcare system, several pharmacy-led environmental sustainability strategies may be cost-neutral or cost-saving. For example, eliminating overwrapping entirely or eliminating redundant plastic bagging during medication transport is not only environmentally sound, but also reduces staff time, material costs and waste disposal burden. In the realm of environmental sustainability, the fourth "R"—Refuse—is gaining traction. In healthcare, refusal may involve challenging unnecessary practices rather than simply recycling them.

These findings suggest that some perceived barriers may stem from outdated assumptions about cost or complexity. Targeted education and sharing of real-world examples may help to shift mindsets.

Reporting Metrics to Leadership

The 2023/24 survey asked about performance reporting related to environmental initiatives, because it is difficult to build accountability, track progress or justify investment without such data. Only 14% (21/147) of LHS respondents and 2% (5/231) of SHS respondents reported that environmental sustainability metrics

were conveyed to senior leadership or executive committees. The lack of metrics visibility may partially explain the limited allocation of resources and the slow spread of more ambitious initiatives.

Summary

Hospital pharmacies across Canada are engaged in environmental sustainability, particularly through strategies that intersect with quality, safety and cost-efficiency. However, the 2023/24 survey revealed notable gaps in departmental planning, dedicated leadership and cross-functional collaboration. Expanding pharmacy's role in climate action will require integration into formal planning processes, protected staff time, performance metrics and system-level alignment.

Disaster Preparedness

While environmental sustainability efforts aim to reduce the healthcare sector's long-term impact on the planet, disaster preparedness is intended to address the immediate and acute disruptions that can arise from both natural and human-caused crises. These two domains are inherently interconnected. With the increasing frequency and severity of climate-related disasters—such as floods, wildfires and extreme weather events—healthcare systems must not only work to minimize their environmental footprint but also build resilience to withstand and recover from such shocks. For pharmacy services, this dual imperative means designing supply chains, infrastructure and staffing models that are both sustainable and disaster-resilient.

Pharmacy departments play a critical role in ensuring medication safety and continuity of care during climate-related disasters.

Pharmacy departments across Canada face increasing demands to ensure continuity of medication management during extreme weather events and natural disasters. In recent years, Canada has witnessed a notable escalation in the frequency and severity of natural disasters, including wildfires, floods and extreme weather events. The 2023 wildfire season in Canada, for instance, was unprecedented, with fires consuming approximately 16.5 million hectares—more than double the previous record.[5] Such events have placed immense strain on healthcare infrastructure, necessitating robust disaster preparedness and resilience strategies within hospital pharmacy departments. As climate-related emergencies intensify, the development of healthcare system resilience requires proactive disaster planning and personnel preparedness within pharmacy services. The 2023/24 survey explored both the presence of disaster adaptation strategies and the extent of training activities in pharmacy departments nationwide.

- Just over half (56%, 83/148) of LHS respondents and two-thirds (67%, 149/222) of SHS respondents reported having pharmacy-specific adaptation strategies for disasters and extreme weather.
- Among LHS respondents, disaster plans were most prevalent in facilities with 201 to 500 acute care beds (66%, 31/47); among SHS respondents, BC (91%, 31/34) was the region with the highest adoption of disaster plans.
- Disaster planning was reported to be in progress by 14% (20/148) of LHS respondents and 9% (19/222) of SHS respondents.

- Routine disaster training for pharmacy staff was reported by 31% (45/147) of LHS respondents and 51% (114/222) of SHS respondents, which suggests a stronger commitment to preparedness among smaller facilities.
- Among LHS respondents, training was highest among teaching hospitals (43%, 20/47) and facilities with > 500 beds (33%, 16/48); among SHS respondents, AB (82%, 61/74) led the country.
- Despite the reported adoption of disaster planning by many respondents, a notable proportion lacked training initiatives to support preparedness. Among LHS respondents, 52% (76/147) had not implemented routine training activities, and among SHS respondents, 39% (86/222) reported no training in this area.
- Several LHS respondents, particularly in Ontario (ON) and QC, were still in the early stages of both disaster planning (31% [10/32] and 3/24 [13%], respectively) and training development (25% [8/32] and 17% [4/24], respectively), which highlights uneven provincial progress.

Taken together, these data suggest that while many respondents have recognized the need for pharmacy-specific disaster strategies, fewer have operationalized them through routine training and exercises. The gap was particularly wide among LHS respondents, whose facilities may have complex organizational structures that hinder implementation. In contrast, the facilities represented by SHS respondents, particularly those in AB and BC, may serve as models for practical and scalable preparedness, or these smaller sites could be benefiting from provincial coordination efforts related to disaster preparedness.

Table H-2 Adaptation and Preparedness Strategies, 2023/24

Preparedness Strategy	Large Hospital Survey	Small Hospital Survey
Heat and/or humidity monitoring of medications/equipment during heat waves	**63%** (93/147)	**61%** (135/222)
Medication management plan during heat waves for drugs affected by body temperature	**11%** (17/148)	**30%** (67/222)
Increasing medication inventory due to natural disasters/extreme weather	**54%** (80/147)	**64%** (143/222)

Base: All respondents to this question in the LHS and SHS

Responses concerning additional preparedness strategies, as shown in **Table H-2**, offer further insight into the disaster readiness landscape among hospital pharmacies nationally. Actions to address heat-related medication concerns, such as monitoring environmental conditions and planning for pharmacokinetic changes, were inconsistently addressed **(Table H-2)**. Inventory augmentation strategies saw greater uptake among SHS respondents than among LHS respondents, suggesting potentially greater risk perception or agility in supply chain management at smaller sites.

As climate-related disasters continue to test healthcare system resilience, these findings highlight the essential role of pharmacy in disaster mitigation planning. From formal preparedness protocols to practical inventory strategies, continued momentum toward comprehensive emergency readiness is necessary.

Artificial Intelligence and Cybersecurity Readiness

As pharmacy operations increasingly rely on interconnected technologies, the risk of cyberattacks and the need for robust digital infrastructure have become central to healthcare system resilience. At the same time, AI is gaining ground as a transformative force, offering opportunities to automate tasks, enhance clinical decision-making and address workforce pressures. This section explores the state of cybersecurity preparedness and the adoption of AI-based technologies in hospital pharmacy practice, as indicated by the 2023/24 survey results.

Table H-3 Artificial Intelligence Utilization, 2023/24

AI Use Category	Large Hospital Survey	Small Hospital Survey
AI not in use	**86%** (128/148)	**91%** (210/231)
AI used for administrative activities	**8%** (12/148)	**5%** (12/231)
AI used for drug distribution activities	**3%** (5/148)	**6%** (13/231)
AI used for clinical activities	**3%** (4/148)	**6%** (14/231)

Base: All respondents to this question in the LHS and SHS

Across both LHS and SHS respondents, AI use remains limited, with a large majority of respondents reporting no current utilization **(Table H-3)**. Administrative activities represent the primary entry point, likely due to the lower complexity and cost of implementing AI in non-clinical contexts. These findings underscore the limited adoption of AI by Canadian hospital pharmacies at the time this survey was conducted.

Table H-4 Cybersecurity Preparedness, 2023/24

Cybersecurity Strategy/Incidence	Large Hospital Survey	Small Hospital Survey
Cyberattack response plan in place	**59%** (87/147)	**44%** (100/228)
Plan reviewed/tested annually	**23%** (20/87)	**53%** (52/99)
Participation in cybersecurity training	**62%** (91/147)	**71%** (163/230)
Facility previously affected by a cyberattack	**14%** (21/147)	**4%** (9/231)
Facility had downtime plan at time of attack	**70%** (14/20)	**89%** (8/9)

Base: All respondents to this question in the LHS and SHS

Relative to LHS respondents, SHS respondents were less likely to report having detailed cyberattack plans, but those that did have such plans were more diligent in testing them regularly **(Table H-4)**. Participation in cybersecurity training was reported by more SHS respondents (71%, 163/230) than LHS respondents (62%, 91/147). The higher incidence of cyberattacks reported by LHS respondents may reflect both greater digital complexity and larger target profiles in large facilities. Encouragingly, many affected departments had a downtime plan in place, which emphasizes the importance of readiness planning. These results suggest that developing a cybersecurity strategy is an area of opportunity for most survey respondents in Canada.

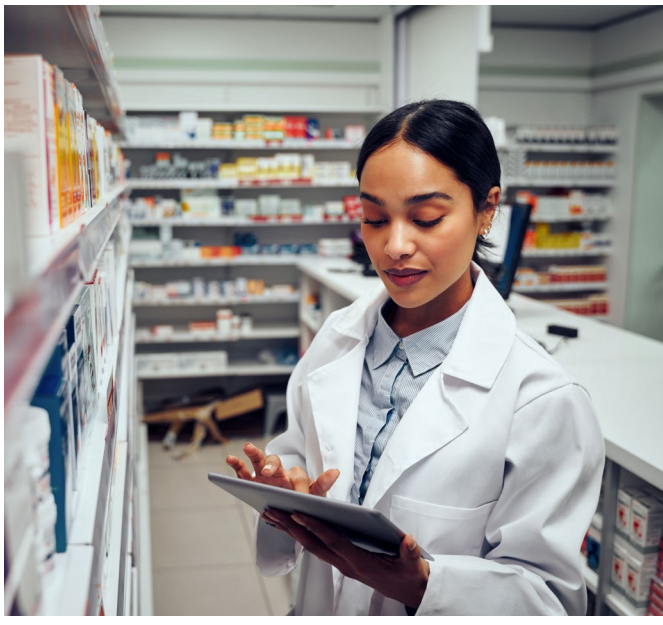
Drug Shortage Mitigation Strategies

Medication shortages have continued to challenge both LHS and SHS respondents, requiring them to draw on a wide range of mitigation strategies. These shortages have stemmed from a combination of global manufacturing disruptions, demand surges and fragile pharmaceutical supply chains. Hospital pharmacy teams across Canada have demonstrated strong coordination and adaptability, implementing both proactive and reactive approaches to protecting patient care and minimizing system strain.

The 2023/24 survey data revealed near-universal adoption of the following core mitigation strategies:

- Sharing medications with or borrowing medications from other facilities was reported by 100% (149/149) of LHS respondents and 99% (230/233) of SHS respondents.
- Converting patients to alternative or non-formulary therapies of similar efficacy was reported by 96% (143/149) of LHS respondents and 97% (226/233) of SHS respondents.
- Changing the format of a product was reported by 93% (138/149) of LHS respondents and 92% (215/233) of SHS respondents.
- Prioritizing high-risk patients was reported by 93% (139/149) of LHS respondents and 91% (213/233) of SHS respondents.

These strategies were used with remarkable consistency across all regions and facility sizes. Their widespread adoption reflects the profession's capacity to adapt quickly to shortages while maintaining clinical integrity. Specifically, borrowing and substitution have become standard operational norms—an expected part of practice, rather than exceptions. This underscores the integration of drug shortage management into routine pharmacy workflows.



Beyond these strategies, several additional mitigation strategies had greater variability in uptake:

- Importing medications from outside Canada was reported by 97% (144/149) of LHS respondents and 86% (200/233) of SHS respondents.

- Increasing minimum inventory levels of essential medications was reported by 84% (125/149) of LHS respondents and 81% (188/233) of SHS respondents.
- Compounding medications in short supply was reported by 83% (123/149) of LHS respondents and 66% (154/233) of SHS respondents.
- Diversifying the supplier base was reported by 77% (115/149) of LHS respondents and 72% (168/233) of SHS respondents.

These responses highlight how resource capacity and infrastructure influenced mitigation decisions. LHS respondents were more likely than SHS respondents to report compounding and pre-emptive inventory increases—likely due to higher staffing levels, greater technical capabilities and more readily available infrastructure. Notably, SHS respondents from AB reported particularly high use of supplier diversification and government-facilitated allocations (93%, 69/74 for both).

LHS respondents were more likely than SHS respondents to report compounding medications and increasing inventory levels as mitigation strategies.

Less common but still clinically significant strategies were also reported:

- Using less effective medications was reported by 43% (64/149) of LHS respondents and 53% (124/233) of SHS respondents.
- Scheduling concurrent treatments to reduce wastage was reported by 44% (65/149) of LHS respondents and 36% (83/233) of SHS respondents.
- Increasing public and patient awareness about medication shortages was reported by 36% (53/149) of LHS respondents and 40% (93/233) of SHS respondents.
- Reducing pharmacy services was reported by 17% (25/149) LHS respondents and by 24% (57/233) of SHS respondents.
- Cancelling or delaying treatments was reported by 29% (43/149) of LHS respondents and 29% (67/233) of SHS respondents.

More than half of SHS respondents reported the use of less effective therapies during drug shortages.

Overall, these findings serve as a reminder that certain mitigation strategies may have unintended consequences. The use of less effective alternatives and reductions in the provision of pharmacy services signal escalating pressure points—situations where standard mitigation efforts may not have been sufficient. Facilities facing severe shortages may have been forced to make difficult clinical trade-offs, potentially exposing patients to suboptimal therapy.

The literature validates these concerns. A systematic review by Canada's Drug Agency (formerly known as CADTH) found that drug shortages, when poorly mitigated, were associated with various adverse

outcomes, including disease progression, adverse events and increased mortality.[6] Nevertheless, when mitigation was well executed, most substitute products were considered safe and effective. A comparative analysis published in 2024 in JAMA further found that Canada's structured, collaborative approach to managing drug shortages made meaningful supply interruptions 40% less likely than in the United States.[7] This finding likely reflects the high degree of national coordination and collaboration among hospital pharmacy personnel and the early institutionalization of shortage protocols in Canadian hospital practice.

In summary, the 2023/24 survey data affirm that Canadian hospital pharmacies have developed a layered and responsive framework for managing drug shortages. Foundational strategies such as inter-facility collaboration, therapeutic substitution and product adaptation are now standard practice. Meanwhile, higher-resource strategies like compounding and inventory expansion are deployed variably across institutions, depending on local capacity. With drug shortages expected to remain a persistent feature of pharmaceutical care, Canada's experience offers important insights into building resilient systems capable of maintaining patient safety under pressure.

Alternative Methods of Providing Care

During the pandemic, there was a move toward using alternative methods of providing patient care. Various technologies were seen as tools that organizations could use during the pandemic primarily to reduce infection risk, maintain continuity of care and expand access. At the time, the approach was seen as generally effective, with outcomes often comparable to in-person care but noted limitations for specific patients.[8] Given widespread uptake of these alternatives during the pandemic, there was interest in learning whether facilities had continued or expanded their use of these options.

As shown in **Table H-5**,

- 53% (79/148) of LHS respondents and 78% (182/233) of SHS respondents reported never having used telehealth solutions during the COVID-19 pandemic.
- Of those who did report using telehealth technology during the COVID-19 pandemic, 22% (15/69) of LHS respondents and 37% (19/51) of SHS respondents reported that they are no longer using it.
- Of the LHS respondents who reported continuing use of telehealth, 72% (39/54) used it for patient assessment, 72% (39/54) for patient education and 65% (35/54) for monitoring and follow-up.
- Of the SHS respondents who reported continuing use of telehealth, 66% (21/32) used it for patient assessment, 44% (14/32) for patient education and 69% (22/32) for patient monitoring and follow-up.
- Although the practice of using telehealth technology has not been abandoned completely, the data from the 2023/24 survey do not indicate more widespread adoption.

Table H-5 Use of Telehealth Technology During and Since COVID-19 Pandemic, 2023/24

Use of Telehealth Technology	Large Hospital Survey	Small Hospital Survey
Used telehealth, but no longer using	**22%** (15/69)	**37%** (19/51)
Using for patient assessment	**72%** (39/54)	**66%** (21/32)
Using for patient education	**72%** (39/54)	**44%** (14/32)
Using for patient monitoring and follow-up	**65%** (35/54)	**69%** (22/32)
Never used telehealth	**53% (79/148)**	**78% (182/233)**

Base: Respondents who reported using telehealth (during or since the pandemic)

Table H-6 shows the frequency of contracting for various services from remote providers by large and small hospitals. The service most frequently contracted by large hospitals was on-call coverage (7%, 11/148), whereas the service most frequently contracted by small hospitals was daytime coverage when pharmacists were not available (17%, 38/226).

Table H-6 Services Contracted from Remote Pharmacy Service Providers, 2023/24

Contracted Service	Large Hospital Survey	Small Hospital Survey
On-call coverage	**7%** (11/148)	**8%** (17/226)
After-hours medication order entry/ verification coverage	**7%** (10/148)	**8%** (17/226)
Daytime coverage when pharmacists are not available (set number of days per week)	**5%** (8/148)	**17%** (38/226)
To check pharmacy technicians or pharmacy assistants because a pharmacist is not available	**1%** (2/148)	**7%** (15/226)
Other remote services not listed above	**3%** (4/148)	**7%** (15/226)
Do not use remote pharmacy services	**83%** (123/148)	**73%** (165/226)

Base: Respondents who reported contracting services from remote pharmacy service providers

Table H-7 highlights the reported use of pharmacy technicians and/or pharmacy assistants, in addition to pharmacists, for on-call coverage, during fiscal year 2023/24. Among facilities that did not have 24/7 coverage by pharmacy technicians and assistants, at least a third used pharmacy technicians and/or pharmacy assistants for on-call coverage: 33% (43/131) of LHS respondents and 40% (92/232) of SHS respondents.

Table H-7 On-Call Coverage by Pharmacy Technicians and/or Pharmacy Assistants (in Addition to Pharmacist Coverage), 2023/24

Use of Pharmacy Technicians and/or Pharmacy Assistants for On-Call Coverage	Large Hospital Survey	Small Hospital Survey
(Net) Pharmacy technician/assistant	**33%** (43/131)	**40%** (92/232)
Pharmacy technicians only	**17%** (22/131)	**33%** (77/232)
Pharmacy assistants only	**5%** (6/131)	**2%** (4/232)
Both pharmacy technicians and pharmacy assistants	**11%** (15/131)	**5%** **(11/232)**
No use of pharmacy technicians or pharmacy assistants	**67%** (88/131)	**60%** (140/232)
Not applicable (facility has 24/7 pharmacy technician and/or pharmacy assistant coverage)	**11%** (17/148)	**< 1%** (1/233)

Base: Respondents whose facilities did not have 24/7 pharmacy technician or pharmacy assistant coverage. "(Net) Pharmacy technician/assistant" represents the total of all responses for pharmacy technicians and pharmacy assistants.

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I - Small Hospital Survey

Shannan Neubauer and Sammu Dhaliwall

The Small Hospital Survey (SHS), which was instituted following an appeal from a group of hospital leaders in the Prairies and Ontario (ON), was first included and presented in the 2020/21 CSHP Hospital Pharmacy in Canada Survey and Report. From the first Hospital Pharmacy in Canada Survey, conducted in 1985/86 there was no limit on acute care bed numbers for potential respondents. In the 1990s, a minimum of 50 acute care beds became the size criterion determining eligibility to respond to the survey. As a result, for nearly two decades, national data concerning pharmacy practice in small hospitals were not collected. However, the desire to better understand the challenges and opportunities associated with small hospital practice, married with the established history of the large hospital survey asking serial trend-identifying questions of a consistent set of respondents each cycle, made it clear that a separate survey of small hospitals was needed. Small hospitals, defined in this survey as facilities with fewer than 50 acute care beds, now account for 304 (50.5%) of the 602 Canadian hospitals documented by the Canadian Institute for Health Information in 2022/23.[1] While small hospitals in Canada account for just over 6% of acute care beds,[1] pharmacy leaders are responsible for ensuring that the pharmacists, pharmacy technicians and pharmacy assistants who practise directly or remotely at these sites adhere to provincial regulatory hospital legislation and standards, the Accreditation Canada Medication Management Standards[2] and the CSHP Hospital Pharmacy Practice Standards,[3] regardless of bed counts.

In the early 2000s, the literature on rural and remote pharmacy focused mainly on drug distribution activities and telepharmacy technology to improve coverage for staffing vacancies in rural North American settings.[4-9] Before publication of the 2020/21 survey report, groups of researchers in Canada and the United States reported the results of surveys of rural pharmacy distributive and clinical services. For example, in April 2019, 24 of 27 pharmacy administrators of hospitals in ON, Québec (QC) and Saskatchewan (SK) that had fewer than 50 acute care beds and were using third-party telepharmacy services responded to a comprehensive survey.[10] They reported on models of care, patient care programs, clinical activities and performance indicators, as well as pharmacy distribution services.[10] Lanier and others[11] described a prospective, cross-sectional survey of rural hospital pharmacy in North Carolina. Clinical services reported included conversion from intravenous to oral administration, anticoagulation monitoring, pharmacokinetic monitoring and antimicrobial stewardship. More recent mixed-methods literature has covered hospital pharmacy practice in Australia and the Middle East, with a focus on remote/virtual care technology innovations by pharmacists aimed at supporting clinical practice in the rural setting.[12-15]

McGinnis and others[16] reported on virtual completion of best possible medication histories by pharmacy technicians in the Emergency Department setting. Groppi and others[17] described a large visiting clinical pharmacy specialist team who became professional coaches and mentors to those in specialized areas of clinical care in rural settings. Despite these examples, there is a trend toward fewer Canadian and US practice publications overall, as well as a paucity of practice-based research in the small hospital setting from locations with on-site, direct care pharmacy professionals, emphasizing the value of the SHS.

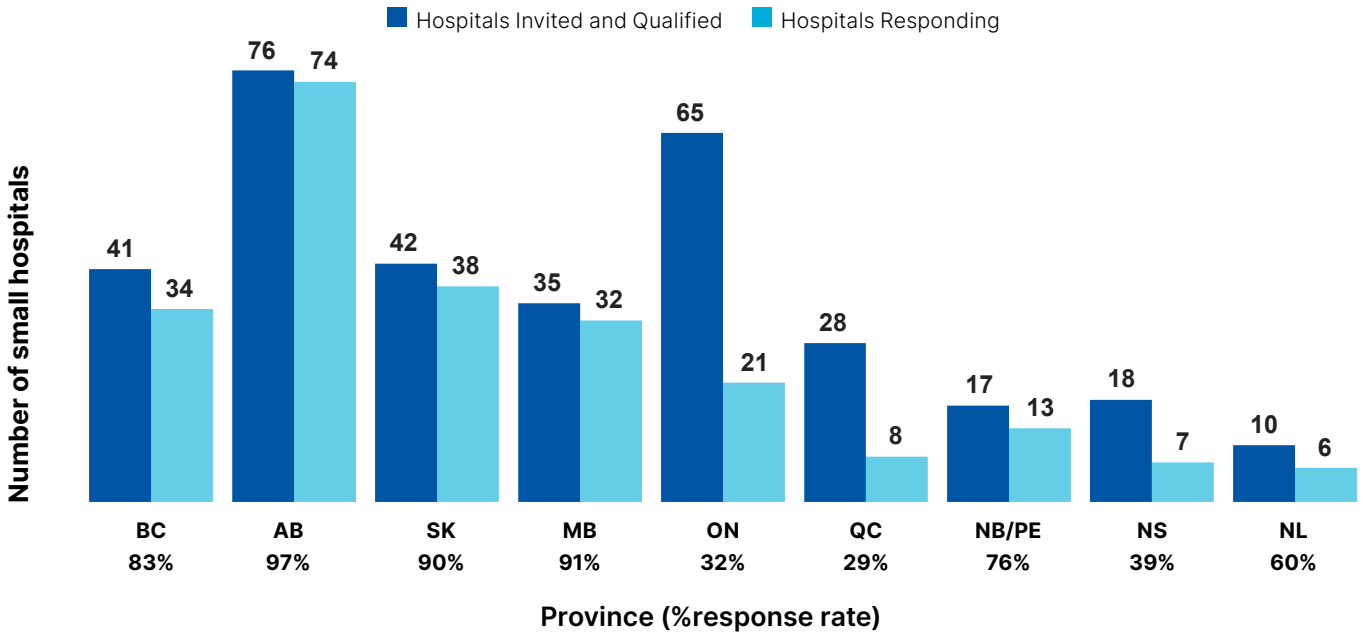
Demographics

The response rate for the 2023/24 SHS was 70% (223/332) **(Figure I-1)**, up from 59% (150/254) in the 2020/21 report. One possible reason for this increase in participation by small hospitals could be the presence of Alberta (AB), with 58 small hospitals, in the 2023/24 survey. AB did not participate in the 2020/21 survey because of province-wide implementation of a standardized clinical information system at the time. For reporting purposes, AB is treated as a region distinct from the combination of SK and Manitoba (MB). Of the 223 SHS respondents, 29% (6/21) of those in ON and 16% (11/70) of those in SK/MB provided data for more than one small hospital, because their administrative responsibilities encompassed multiple small facilities.

Respondents reported a total of 8,837 beds, specifically 4,613 acute care beds and 4,224 non-acute care beds **(Table I-1)**. The average numbers of acute and non-acute care beds per facility were 20 and 36, respectively. These data represent reductions for both bed types from the 2020/21 SHS, when the average numbers were 21 and 44, respectively.

- Respondents in AB reported the largest total numbers of beds, both acute care (n = 1,452) and non-acute care (n = 2,058).
- Respondents in QC reported the smallest total number of acute care beds (n = 239), whereas those in British Columbia (BC) reported the smallest total number of non-acute care beds (n = 216).
- The number of respondents from QC was less than in 2020/21 possibly due to some LHS multi-facility respondents including the small hospital information in their LHS responses.
- The average occupancy rate for small hospitals with acute care beds was 74% overall but varied widely on a regional basis, from 57% in QC to 104% in the Atlantic region (ATL, consisting of the four eastern provinces, specifically New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE] and Newfoundland and Labrador [NL]). In fiscal year 2020/21, the corresponding average occupancy rate for acute care beds was lower, at 58%. As such, there has been an increase of 16 percentage points in the average occupancy rate for acute care beds over the past three years. Even so, the average occupancy rate for acute care beds in small hospitals was still much lower than the 93% rate for hospitals with 50–200 beds (see A - Demographics).

Figure I-1 Response to the Small Hospital Survey, by Province, 2023/24



Note: Total number of respondents = 233 (70%, 233/332)

Table I-1 Small Hospital Demographic Data - Acute Care and Non-acute Care Beds, 2023/24

	All	Region					
		BC	AB	SK/MB	ON	QC	ATL
Acute Care Beds (n=)	**(233)**	**(34)**	**(74)**	**(70)**	**(21)**	**(8)**	**(26)**
Total Beds - acute care	4613	601	1452	1225	510	239	586
Average Beds - acute care	**20**	**18**	**20**	**18**	**24**	**30**	**23**
Base: All respondents, n = 233							
Non-acute Care Beds (n=)	**(117)**	**(12)**	**(55)**	**(15)**	**(18)**	**(7)**	**(10)**
Total Beds - non-acute care	4224	216	2058	436	527	685	302
Average Beds - non-acute care	**36**	**18**	**37**	**29**	**29**	**98**	**30**
Base: All respondents with > 0 non-acute care beds, n = 117							
Occupancy Rate (acute care beds) (n=)	(220)	(34)	(74)	(60)	(21)	(5)	(26)
	74%	**84%**	**75%**	**60%**	**65%**	**57%**	**104%**
Base: All respondents who provided patient days, n = 220							
Occupancy Rate (non-acute care beds) (n=)	(100)	(12)	(55)	(3)	(18)	(4)	(8)
	85%	**93%**	**86%**	**65%**	**74%**	**74%**	**109%**
Base: All respondents with non-acute care beds who provided patient days, n = 100							

Human Resources

The SHS 2023/24 results **(Table I-2)** reveal reductions from 2020/21 in the average number of budgeted full-time equivalent (FTE) positions for pharmacists, pharmacy technicians and pharmacy assistants in small hospitals.

Staffing vacancies reported by small hospital respondents to the 2022 workforce survey of the American Society of Health-System Pharmacists (ASHP) revealed shortages of entry-level and experienced pharmacists in 28.4% and 55.6% of facilities, respectively, and shortages of entry-level and experienced pharmacy technicians in 62.8% and 86.3% of facilities, respectively.[18] The SHS survey for fiscal year 2023/24 posed an FTE vacancy-related question, which showed reported average vacancies of 0.2 FTE (standard deviation [SD] 0.5) for both pharmacists and pharmacy technicians.

Table I-2 Small Hospital Budgeted Full-Time Equivalent (FTE) Positions, 2023/24

Staff position		All	Region					
			BC	AB	SK/MB	ON	QC	ATL
Pharmacist	(n=)	(193)	(20)	(70)	(64)	(12)	(7)	(20)
	Average	**1.0**	**1.4**	**0.9**	**0.7**	**1.7**	**2.3**	**1.5**
	SD	0.9	1.1	0.6	0.5	1.6	1.2	1.3
	Median	**1.0**	**1.0**	**1.0**	**0.5**	**1.0**	**2.8**	**1.0**
	Range	0.0-6.4	0.0-3.4	0.0-3.0	0.1-2.2	0.5-6.4	0.4-3.8	0.4-5.0
Pharmacist manager	(n=)	(109)	(14)	(53)	(26)	(7)	(2)	(7)
	Average	**0.3**	**0.5**	**0.1**	**0.6**	**0.6**	**0.9**	**0.4**
	SD	0.4	0.5	0.0	0.4	0.4	0.1	0.3
	Median	**0.1**	**0.3**	**0.1**	**0.5**	**0.5**	**0.9**	**0.2**
	Range	0.0-1.3	0.1-1.3	0.0-0.2	0.0-1.0	0.0-1.0	0.8-1.0	0.2-1.0
Pharmacy technician manager	(n=)	(68)	(7)	(52)	(0)	(5)	(0)	(4)
	Average	**0.2**	**0.9**	**0.1**		**0.8**		**0.2**
	SD	0.4	0.8	0.0		0.4		0.0
	Median	**0.1**	**1.0**	**0.1**		**1.0**		**0.2**
	Range	0.0-2.0	0.1-2.0	0.0-0.2		0.0-1.0		0.2-0.2
Pharmacy assistant manager	(n=)	(17)	(2)	(15)	(0)	(0)	(0)	(0)
	Average	**0.0**	**0.1**	**0.0**				
	SD	0.1	0.1	0.1				
	Median	**0.0**	**0.1**	**0.0**				
	Range	0.0-0.1	0.0-0.1	0.0-0.1				
Pharmacy Technician	(n=)	(147)	(21)	(63)	(28)	(15)	(0)	(20)
	Average	**1.5**	**2.8**	**1.0**	**0.9**	**2.6**		**1.9**
	SD	1.5	2.5	0.7	0.7	1.9		1.5
	Median	**1.0**	**1.0**	**1.0**	**0.8**	**2.0**		**1.7**
	Range	0.0-7.4	0.4-7.4	0.0-4.0	0.1-3.0	0.6-6.1		0.3-5.0
Pharmacy Assistant	(n=)	(107)	(2)	(57)	(30)	(5)	(7)	(6)
	Average	**1.0**	**2.0**	**0.7**	**0.6**	**1.2**	**4.4**	**1.0**
	SD	1.2	0.0	0.4	0.7	1.0	2.2	0.8
	Median	**0.6**	**2.0**	**0.6**	**0.5**	**1.0**	**4.8**	**0.8**
	Range	0.0-7.1	2.0-2.0	0.0-2.0	0.1-3.8	0.2-3.0	1.0-7.1	0.2-2.0

Base: All respondents providing staffing information, n = 193

- BC had increases in average budgeted FTE positions for pharmacists (by 17%, from 1.2 to 1.4), pharmacy technicians (by 27%, from 2.2 to 2.8) and pharmacy assistants (by 67%, from 1.2 to 2.0).
- ON also had an increase in average budgeted FTEs for pharmacy assistants (by 20%, from 1.0 to 1.2).
- Respondents in QC reported no budgeted FTEs for pharmacy technicians but 4.4 FTEs, on average, for pharmacy assistants. At the time of the survey, QC was just starting to introduce the pharmacy technician role into hospitals.
- Across the country, the total number of budgeted hours per FTE followed a bimodal pattern, with approximately one-third of respondents reporting totals of 1950 or 2022 hours per FTE.

Pharmacy Service and Practice Models

Small hospital personnel and service provider models were variable, in contrast to the consistent on-site provider model in hospitals with 50 or more acute care beds. The consolidation trend away from separate facility leadership toward broader networks, zones, regions and provincial authorities has made way for at least some small hospitals to be serviced by shared pharmacy personnel. Moreover, in some facilities, the provider service model may differ depending on day of the week (weekday vs. weekend) or time of day (daytime vs. nighttime hours), making it challenging for respondents to report their budgeted FTEs. Furthermore, some jurisdictions in Canada divide service provision to acute and non-acute care beds by hospital and community pharmacy, respectively. All of these factors must be considered when comparing regional data on service and practice models.

Three-quarters (75%, 173/232) of SHS respondents reported the use of an on-site hospital pharmacy, an increase from 63% (95/150) reported in 2020/21.

Given this variability and often a combination of service provision models in small hospitals, respondents were asked to specify all practice models used to service their beds. Notably, 61% (142/232) of respondents reported using more than one service model in their facilities **(Table I-3)**.

- Three-quarters (75%, 173/232) of respondents reported that services were provided by an on-site hospital pharmacy, and 62% (143/232) reported service provision by an off-site hospital pharmacy.
- In ON, 90% (18/20) of respondents reported receiving pharmacy services from a remote telepharmacy service.
- In AB, 92% (68/74) of respondents reported receiving pharmacy services from an off-site hospital pharmacy provider.
- Data shows that 87% (201/232) of small hospital respondents used off-site hospital, off-site community and/or telepharmacy service models, at least some of the time. This is an important factor to consider in the Canadian healthcare landscape.

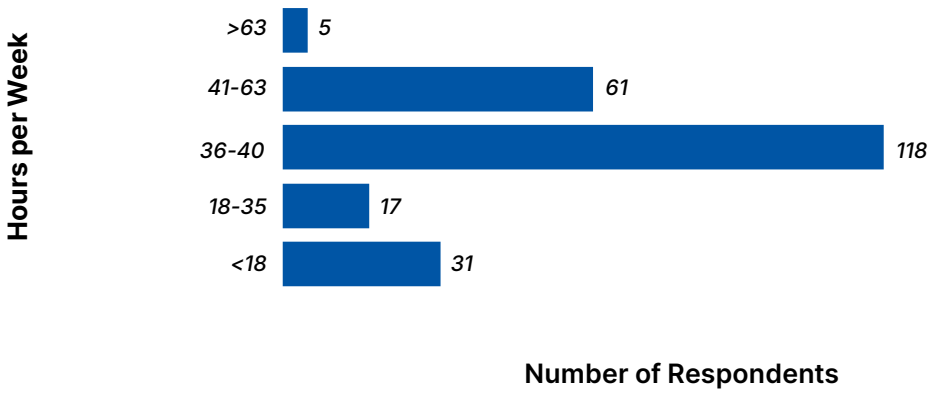
The reported use of telepharmacy services increased to 18% (42/232) in the 2023/24 SHS, up from 11% in 2020/21.

Table I-3 Small Hospital Pharmacy Service Models, 2023/24

How are pharmacy services provided in your facility? (Multiple options allowed)	All	Region					
		BC	AB	SK/MB	ON	QC	ATL
(n=)	(232)	(34)	(74)	(70)	(20)	(8)	(26)
Services are provided by an on-site hospital pharmacy	173	20	69	37	19	7	21
	75%	**59%**	**93%**	**53%**	**95%**		**81%**
Services are provided by an off-site hospital pharmacy	143	18	68	44	2	1	10
	62%	**53%**	**92%**	**63%**	**10%**		**38%**
Services are provided by an off-site community pharmacy provider	16	0	2	8	5	0	1
	7%	**0%**	**3%**	**11%**	**25%**		**4%**
Services are provided by a remote telepharmacy service	42	0	13	5	18	0	6
	18%	**0%**	**18%**	**7%**	**90%**		**23%**

Base: n = 232 respondents
Where the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Figure I-2 Small Hospital On-Site Hours of Service, 2023/24



Base: All respondents providing on-site hours of service, n=232

Most small hospitals (87%, 201/232) reported using some form of remote servicing at least some of the time in practice.

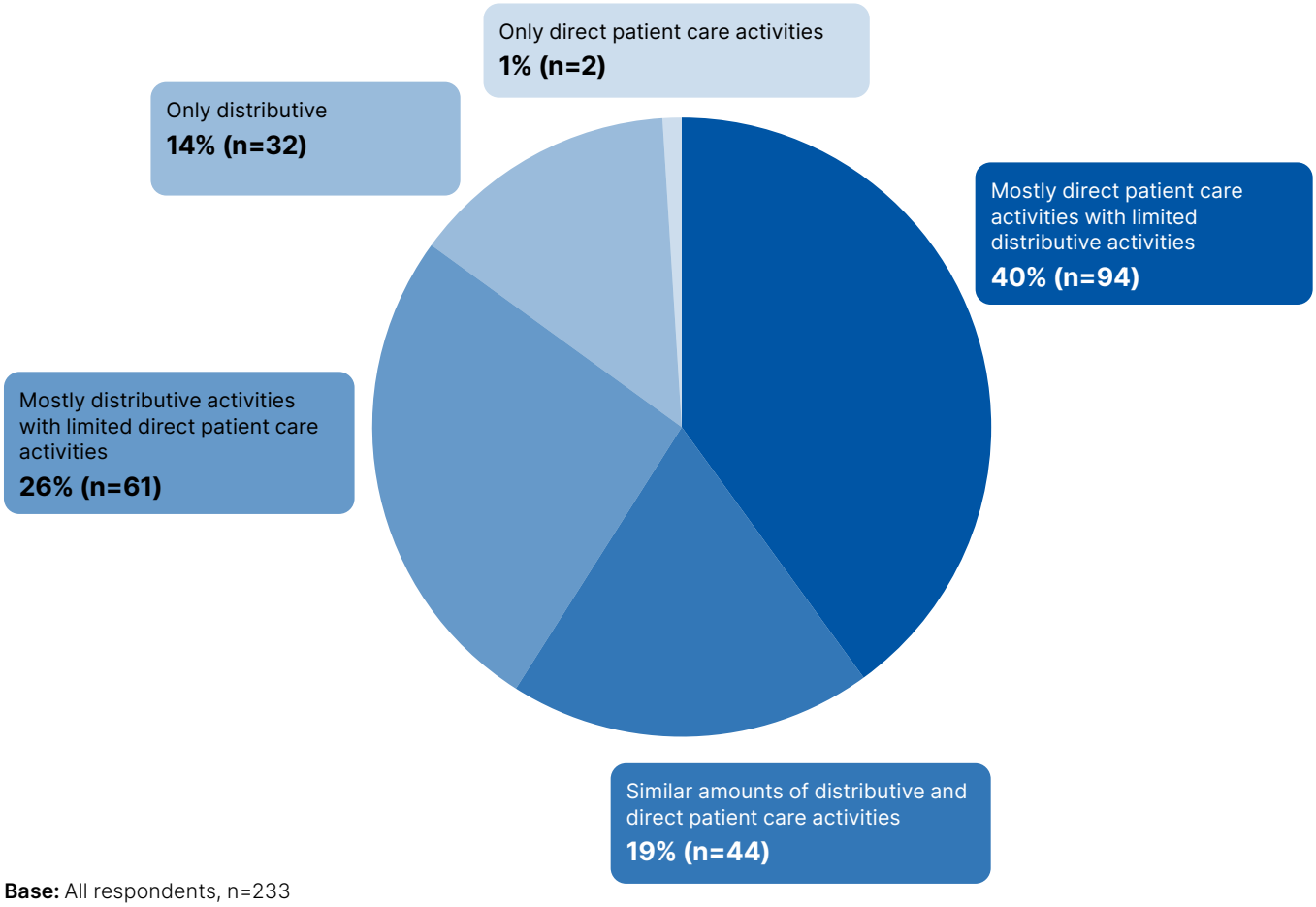
Each respondent was asked to report the number of hours per week their facility's pharmacy was open **(Figure I-2)**, where "a hospital pharmacy is deemed to be 'open' when pharmacy personnel are on the premises to dispense medications and a pharmacist is reviewing, verifying and/or entering medication orders, in person or remotely."

More than half (58%, 135/232) of respondents reported that their pharmacies were open 18–40 hours per week (likely weekdays only), 28% (66/232) reported being open more than 40 hours per week, and 13% (31/232) reported less than 18 hours per week. The majority of small hospitals may need to rely on remote servicing options for off-service pharmacy hours if the Accreditation Canada standard of medication order review by a pharmacist before drug administration for every prescription is to be achieved.

- Nearly all respondents (94%, 218/233) reported that a pharmacist reviewed 95% of medication orders for appropriateness during hours of operation.
- Less than one-third (28%, 66/232) of respondents reported hours of operation that might have included evening and weekend service hours.
- More than one-third (83/233) and about one-quarter (23%, 54/232) of respondents reported that pharmacists in their facility reviewed at least 95% of medication orders before drug removal from wardstock or from automated dispensing cabinets (ADCs), respectively.

Pharmacists may continue to share distribution roles and functions with pharmacy technicians and pharmacy assistants, or their role may have evolved into the provision of solely clinical, direct patient care work. Forty percent (93/233) of small hospital respondents reported that pharmacists in their facilities provided mostly or only distributive services **(Figure I-3)**. Nineteen percent (44/233) reported that pharmacists performed similar amounts of distributive and direct patient care functions, whereas 41% (96/233) reported direct patient care either solely or as the majority of pharmacists' practice. By comparison, in the 2021 ASHP survey of clinical services and workforce, 57.3% (89/155) of respondents from facilities with fewer than 50 beds reported that their pharmacists were performing direct patient care responsibilities for at least 40 hours per week.[19]

Figure I-3 Small Hospital Pharmacist Practice Models, 2023/24

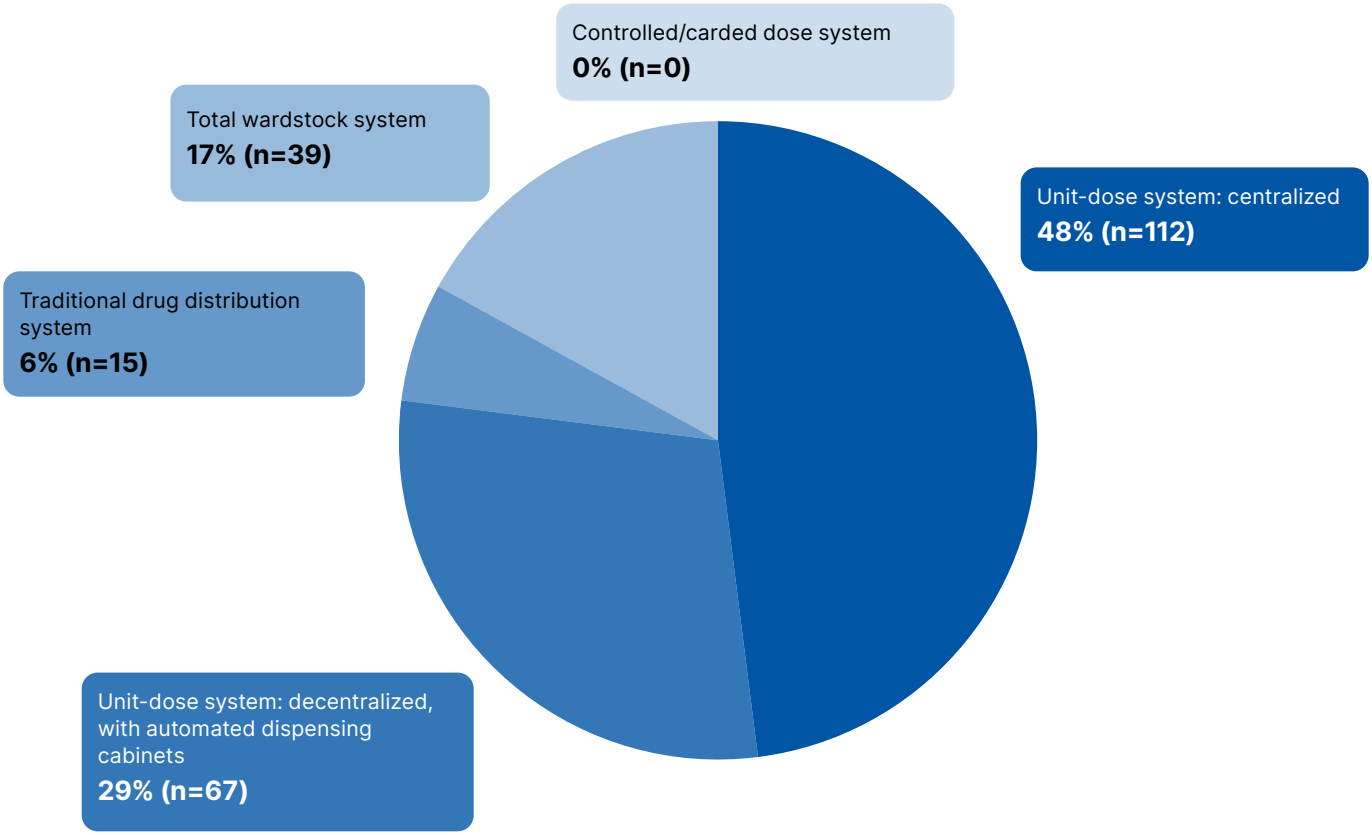


Base: All respondents, n=233

Drug Distribution Systems

Nearly half (48%, 112/233) of respondents reported using a centralized unit-dose system **(Figure I-4)**. In particular, this distribution system was highly prevalent among AB small hospitals (89%, 66/74). Decentralized unit-dose distribution was reported by 29% (67/233) of SHS respondents; however, 86% (18/21) of small hospitals in ON reported using a decentralized model. In 2020/21, approximately one-third (31%, 47/150) of respondents reported using traditional or total wardstock systems for drug distribution to acute care beds. This proportion decreased to 23% (54/233) in 2023/24, a positive trend toward improved medication safety.

Figure I-4 Small Hospital Drug Distribution Systems, 2023/24



Base: All respondents, n=233

In small hospitals participating in the 2023/24 survey, the medication order entry function was performed mainly by pharmacists. More specifically, 84% (188/223) of respondents reported that pharmacy assistants were not involved in the order entry process, and 70% (158/227) reported that pharmacy technicians were not involved.

Most small hospitals responding to the SHS (86%, 200/232) reported not offering non-hazardous sterile compounding services on site.

Implementation of the sterile compounding standards of the National Association of Pharmacy Regulatory Authorities (NAPRA)[20,21] has begun to change the roles and duties of pharmacy technician personnel in hospital pharmacy practice. As these standards become adopted across Canada, it will be important to interpret changes in on-site sterile production with consideration of how products are prepared and distributed (centralized vs. decentralized) for both central intravenous admixture programs and oncology services in various regions. Other considerations that may affect these data include the increasing

frequency of pharmaceutical manufacturers/vendors preparing batches of sterile compounds for purchase by hospitals. These outsourced sterile products represent an appealing option for facilities with consistently vacant pharmacy technician positions. **Table I-4** depicts consistent reductions (for 2023/24, relative to 2020/21) in on-site sterile compounding of non-hazardous drugs in small hospitals. By contrast, sterile compounding of hazardous products has remained similar to the situation in 2020/21, with the exception of the ATL region, where reported on-site compounding of hazardous products declined from 45% (10/22) of facilities in 2020/21 to 27% (7/26) of facilities in 2023/24. In 2023/24, AB had the lowest reported prevalence of on-site sterile compounding of non-hazardous drugs (3%, 2/74) and hazardous drugs (4%, 3/74) in small hospitals, perhaps due to logistical challenges and compounding by non-pharmacy personnel in clinical areas.

Table I-4 Small Hospital On-Site Non-Hazardous and Hazardous Compounding, 2023/24 vs. 2020/21

	All	All	Region											
			BC		AB		SK/MB		ON		QC		ATL	
	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21
On-Site Non-hazardous Compounding, 2023/24 vs 2020/21														
(n=)	(232)	(150)	(34)	(42)	(74)		(70)	(58)	(20)	(16)	(8)	(12)	(26)	(22)
YES	32	51	9	19	2		8	10	4	8	3	7	6	7
Percent	**14%**	**34%**	**26%**	**45%**	**3%**		**11%**	**17%**	**20%**	**50%**		**58%**	**23%**	**32%**
On-Site Hazardous Compounding, 2023/24 vs 2020/21														
(n=)	(233)	(150)	(34)	(42)	(74)		(70)	(58)	(21)	(16)	(8)	(12)	(26)	(22)
YES	44	50	12	15	3		11	12	7	6	4	7	7	10
Percent	**19%**	**33%**	**35%**	**36%**	**4%**		**16%**	**21%**	**33%**	**38%**		**58%**	**27%**	**45%**

Base: All respondents for 2023/24; n = 232 for non-hazardous compounding question and n = 233 for hazardous compounding question.
For 2020/21, n = 150 for non-hazardous compounding and hazardous compounding questions
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Technology

Information and medication-related technologies are features that improve patient safety at the bedside. As Canadian hospitals move toward a closed-loop medication system, data about these technologies may help guide us toward technological systems and tools that have yet to be implemented in small hospitals. In this regard, since 2020/21, the use of smart pump technology has increased in most regions (**Table I-5)**.

- Seventy-six percent (174/230) of respondents from small hospitals reported employing smart pump technology, compared to 100% (52/52) of hospitals with 50–200 beds (see G - Technology).
- Reports of barcoding during preparation in the pharmacy and during dispensing (loading into ADCs) increased from less than one-quarter of respondents for each function in 2020/21 to 44% (102/230) and 45% (103/231) of respondents, respectively, in 2023/24.

Table I-5 Small Hospital Use of Technologies, 2023/24

Does your facility employ the use of ...	All	Region					
		BC	AB	SK/MB	ON	QC	ATL
Smart Pumps (n=)	(230)	(34)	(74)	(68)	(21)	(8)	(25)
Yes	174	33	39	54	19	4	25
	76%	**97%**	**53%**	**79%**	**90%**		**100%**
No	56	1	35	14	2	4	0
	24%	3%	47%	21%	10%		**0%**
Barcoding during drug preparation (n=)	(230)	(34)	(74)	(69)	(20)	(7)	(26)
Yes	102	7	69	1	14	3	8
	44%	**21%**	**93%**	**1%**	**70%**		**31%**
No	128	27	5	68	6	4	18
	56%	79%	7%	99%	30%		69%
Barcoding during drug dispensing (n=)	(231)	(34)	(74)	(69)	(21)	(7)	(26)
Yes	103	4	74	1	13	3	8
	45%	**12%**	**100%**	**1%**	**62%**		**31%**
No	128	30	0	68	8	4	18
	55%	88%	0%	99%	38%		69%
Barcoding during medication administration to patients (n=)	(232)	(34)	(74)	(69)	(21)	(8)	(26)
Yes	92	4	74	0	14	0	0
	40%	**12%**	**100%**	**0%**	**67%**		**0%**
No	140	30	0	69	7	8	26
	60%	88%	0%	100%	33%		100%
Operational computerized provider order entry (CPOE) system (n=)	(231)	(34)	(74)	(69)	(20)	(8)	(26)
Yes	90	2	72	0	12	0	4
	39%	**6%**	**97%**	**0%**	**60%**		**15%**
No	141	32	2	69	8	8	22
	61%	94%	3%	100%	40%		85%

Base: All respondents providing information on the use of technologies; n = 232
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

The use of barcoding for pharmacy/dispensing by 44% (102/230) of SHS respondents is comparable to the 37% (19/52) reported by hospitals with 50–200 beds (see G - Technology). The use of technologies for prescribing (e.g., computerized prescribe order entry [CPOE]) and medication administration (e.g., barcoding of the patient identification band and drug product at the bedside) are components of the system that require engagement of leadership, as well as information technology and clinical team members outside of pharmacy services. The results of the 2023/24 SHS showed an increase in the use of these technologies overall (relative to 2020/21), mostly due to inclusion of AB data, along with increases in ON. Interestingly, small hospitals were slightly ahead of hospitals with 50–200 beds when it came to these more integrated technologies, with CPOE implementation reported by 39% (90/231) of SHS respondents compared to 29% (15/52) of respondents from hospitals with 50–200 beds, and patient barcoding reported by 40% (92/232) vs. 33% (17/52) by hospitals with 50-200 beds, respectively (see G - Technology). In other regions, the implementation of these more interdisciplinary components of the medication system was similar between small hospitals and those with 50–200 beds.

Clinical Pharmacy Services

The 2023/24 survey asked three questions about clinical pharmacy services in small hospitals, specifically regarding reactive vs. proactive activities, performance indicators, and practice research.

In small hospital practice, the split between reactive and proactive clinical pharmacy activities was 48% (91/189) and 52% (98/189), respectively. This finding can be related to the results for questions about the split between distributive and patient care activities, whereby 40% (93/233) of respondents reported that pharmacists' time was spent primarily in the dispensary, reacting to medication orders written in the patient care areas **(Figure I-3)**. Proactive services occur when pharmacists are present in the patient care areas, proactively reviewing and assessing patients' pharmacotherapy, developing care plans, and interacting with patients and the interdisciplinary care teams.

The collection of clinical pharmacy key performance indicators (cpKPIs) in small hospitals appears to be increasing in Canada: 49% (92/188) of respondents reported that their facilities were collecting cpKPI data in 2023/24, compared to 37% (55/150) in 2020/21 **(Table I-6)**. Although collection of cpKPI data in BC remained virtually unchanged, at 63% (10/16), in both SK/MB and the ATL region the number of facilities that reported collecting cpKPI data in 2023/24 approximately doubled relative to 2020/21.

Table I-6 Small Hospitals Collecting Data for Clinical Pharmacy Key Performance Indicators (cpKPIs), 2023/24 vs. 2020/21

	All	All	Region											
			BC		AB		SK/MB		ON		QC		ATL	
	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023/24	2020/21	2023 24	2020/21	2023/24	2020/21
(n=)	(188)	(150)	(16)	(42)	(73)		(57)	(58)	(17)	(16)	(5)	(12)	(20)	(22)
YES	92	55	10	26	32		32	15	5	9	2	0	11	5
Percent	**49%**	**37%**	**63%**	**62%**	**44%**		**56%**	**26%**	**29%**	**56%**		**0%**	**55%**	**23%**

Base: Respondents answering the question about cpKPI data collection; n = 188 in 2023/24 and n = 150 in 2020/21
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Practice-based research conducted by small hospital pharmacy staff was rare, with only 6% (14/228) of respondents reporting involvement in research activities. Consistent with prior work, research activity and published initiatives are concentrated in academic and larger urban hospitals, while community and rural hospitals in both Canada and the United States remain underrepresented in the peer-reviewed literature.[22,23] Among respondents who did report research as part of their activities, 64% (9/14) and 50% (7/14) did so through collaboration with other small hospitals and with regional/provincial hospital residency programs, respectively **(Table I-7)**. These data should further encourage the reporting of the impact of innovation, technology, quality and safety improvements and expanded scope of practice in small hospitals, particularly for the 75% (173/232) of facilities with on-site hospital pharmacies.

Table I-7 Small Hospital Participation in Practice-Based Research, 2023/24

	All	Region					
		BC	AB	SK/MB	ON	QC	ATL
(n=)	(14)	(2)	(2)	(8)	(1)	(0)	(1)
Collaboratively with other small hospital pharmacies	9 **64%**	1	0	8	0	0	0
Collaboratively as part of a regional or provincial pharmacy residency program	7 **50%**	0	1	5	0	0	1
Collaboratively with a nearby regional or tertiary hospital(s)	4 **29%**	0	0	3	0	0	1
Collaboratively with other healthcare disciplines	3 **21%**	1	1	0	0	0	1

Base: n = 14 respondents
Whenever the n value was less than 10, percentages were not calculated to avoid potentially misleading comparisons

Conclusion

The regional response rates for this second SHS were very high (83%–91%) in the western provinces and remained unchanged from 2020/21 (about 30%) in central Canada, for an overall rate of 70% (233/332) **(Figure I-1)**.

The SHS data for 2023/24 show that small hospitals are transitioning away from less robust drug distribution systems (i.e., traditional and wardstock), a trend that will support safer care provision. The NAPRA sterile compounding standards are changing hospital pharmacy technicians' duties nationwide, with some reduction in on-site preparation of non-hazardous products, while hazardous product preparation remains a stable component of small hospital practice. There appear to be advances in technology implementation in small hospitals since the 2020/21 survey. These technologies offer patients improved safety, and some provinces have made the decision to implement barcoding and CPOE in hospitals of all sizes.

There is room for small hospital practice to evolve toward greater participation in clinical work at the bedside. Two SHS questions, concerning distributive vs. clinical functions and reactive vs. proactive clinical service provision, have revealed that many pharmacists working in small hospitals spend their time performing activities that other pharmacy personnel are capable of providing. It is encouraging to see an increase in the number of facilities collecting and reporting cpKPIs, activities that are associated with improved healthcare utilization and patient care outcomes. Continued effort toward a pharmacist presence on the clinical team and working with patients is required.

The publication of North American studies detailing small hospital practice experience and improvements, which were more common in the early 2000s, is waning. There remains an important opportunity to contribute to the literature by reporting on the value of technology implementation, collaboration with pharmacy technicians and assistants, and quality improvement strategies that may assist in increasing direct patient care activities and interdisciplinary work in small hospitals.

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Appendix I

List of Tables and Figures

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Appendix II

Recognition List

We wish to recognize all of the healthcare facilities in the list below for their willingness to contribute to the success of the 2023/24 Hospital Pharmacy in Canada Survey Report. Respondents from hospitals that appear in this list participated, or attempted to participate, in the survey by submitting data from their respective facility on or before January 6, 2025. A special thank you to the 233 respondents from facilities with less than 50 acute care beds that responded to our second edition of the Small Hospital Survey. Please note that data from some respondents were not included in the analysis if the data provided were incomplete, insufficient or inconsistent with answers given to previous questions.

Small Hospital Survey Respondents - less than 50 acute care beds

Hospital	City	Province
100 Mile District General Hospital	100 Mile	BC
All Nations' Healing Hospital	Fort Qu'Appelle	SK
Altona Community Memorial Health Centre	Altona	MB
Arborg and Districts Health Centre	Arborg	MB
Arcola Health Centre	Arcola	SK
Arrow Lakes	Nakusp	BC
Assiniboia Union Hospital	Assiniboia	SK
Athabasca Healthcare Centre	Athabasca	AB
Atikokan General Hospital	Atikokan	ON
Barrhead Healthcare Centre	Barrhead	AB
Bassano Health Centre	Bassano	AB
Beausejour Health Centre	Beausejour	MB
Beaverlodge Municipal Hospital	Beaverlodge	AB
Bella Coola General Hospital	Bella Coola	BC
Big Country Hospital	Oyen	AB
Biggar and District Health Centre	Biggar	SK
Boissevain Health Centre District	Boissevain	MB
Bonnyville Healthcare Centre	Bonnyville	AB
Boundary Hospital	Grand Forks	BC
Bow Island Health Centre	Bow Island	AB
Broadview Union Hospital	Broadview	SK
Brooks Health Centre	Brooks	AB
Buchanan Memorial Community Health Centre	Neils Harbour	NS
Bulkley Valley District Hospital	Smithers	BC
Burin Peninsula Health Care Centre	Burin	NL
Canmore General Hospital	Canmore	AB
Canora Hospital	Canora	SK
Carberry Plains Health Centre	Carberry	MB
Cardston Health Centre	Cardston	AB
Cariboo Memorial Hospital	Burnaby	BC
Carman Memorial Hospital	Carman	MB
Central Peace Health Complex	Spirit River	AB
Centre de santé communautaire de Lamèque	Lamèque	NB
Charles S. Curtis Memorial Hospital	St. Anthony	NL
Charlotte County Hospital	St. Stephen	NB

** indicates a pediatric hospital respondent

Small Hospital Survey Respondents - less than 50 acute care beds (Continued)

Hospital	City	Province
CISSS de la Montérégie-Ouest - Barrie Memorial Hospital	Ormstown	QC
CISSS de la Montérégie-Ouest - Kateri Memorial Hospital	Kahnawake	QC
CISSS de l'Outaouais - Hôpital de Maniwaki	Maniwaki	QC
CISSS de l'Outaouais - Hôpital Mémorial de Wakefield	Wakefield	QC
CISSS de l'Outaouais - Hôpital Mémorial du Pontiac	Pontiac	QC
CISSS des Iles - Hôpital de l'Archipel	Cap-aux-meules	QC
CISSS des Laurentides - Centre multiservices de santé et services sociaux d'Argenteuil	Lachute	QC
CIUSSS de la Mauricie-et-du-Centre-du-Québec - Hôpital de La Tuque	La Tuque	QC
Claresholm General Hospital	Claresholm	AB
Cold Lake Healthcare Centre	Cold Lake	AB
Consort Hospital and Care Centre	Consort	AB
Coronation Hospital and Care Centre	Coronation	AB
Creston Valley Hospital	Creston	BC
Crowsnest Pass Health Centre	Blairmore	AB
Davidson Health Centre	Davidson	SK
Dawson Creek and District Hospital	Dawson Creek	BC
Daysland Health Centre	Daysland	AB
Deloraine Health Centre	Deloraine	MB
DeSalaberry District Health Centre	St-Pierre-Jolys	MB
Devon General Hospital	Devon	AB
Didsbury District Health Services	Didsbury	AB
Dr. Charles Legrow Health Centre	Port aux Basques	NL
Dr. G. B. Cross Memorial Hospital	Clarenville	NL
Dr. Helmcken Memorial Hospital and Health Center	Clearwater	BC
Drayton Valley Hospital and Care Centre	Drayton Valley	AB
Drumheller Health Centre	Drumheller	AB
E. M. Crowe Memorial Hospital	Eriksdale	MB
Edson Healthcare Centre	Edson	AB
Elk Point Healthcare Centre	Elk Point	AB
Elk Valley Hospital	Fernie	BC
Emmanuel Care - St. Anthony's Hospital	Esterhazy	SK
Emmanuel Care - St. Joseph's Hospital [Estevan]	Estevan	SK
Emmanuel Care - St. Joseph's Hospital/Foyer d'Youville	Gravelbourg	SK
Emmanuel Care - St. Peter's Hospital [Melville]	Melville	SK
Englehart Hospital	Englehart	ON
Espanola General Hospital	Espanola	ON
Fairview Health Complex	Fairview	AB
Fishermen's Memorial Hospital	Lunenburg	NS
Flin Flon General Hospital	Flin Flon	MB
Fort Nelson General Hospital	Fort Nelson	BC
Fort Saskatchewan Community Hospital	Fort Saskatchewan	AB
Fox Creek Healthcare Centre	Fox Creek	AB
G. R. Baker Memorial Hospital	Quesnel	BC
George McDougall - Smoky Lake Healthcare Centre	Smoky Lake	AB
Gimli Community Health Centre	Gimli	MB
Glace Bay General Hospital	Glace Bay	NS
Glenboro Health Centre	Glenboro	MB
Golden and District General Hospital	Golden	BC
Grande Cache Community Health Complex	Grande Cache	AB
Grandview Hospital	Grandview	MB
Haida Gwaii Hospital and Health Centre	Daajing Giids	BC
Halton Healthcare - Georgetown Hospital	Georgetown	ON
Hamiota Health Centre	Hamiota	MB
Hanna Health Centre	Hanna	AB
Heiltsuk (Bella Bella) Hospital	Bella Bella	BC
Herbert and District Integrated Health Facility	Herbert	SK
High Prairie Health Complex	High Prairie	AB
High River General Hospital	High River	AB
Hinton Healthcare Centre	Hinton	AB
Hôpital de l'Enfant-Jésus de Caraquet	Caraquet	NB

** indicates a pediatric hospital respondent

Small Hospital Survey Respondents - less than 50 acute care beds (Continued)

Hospital	City	Province
Hôpital Général de Grand-Sault (Grand-Falls General Hospital)	Grand Falls	NB
Hôpital Glengarry Memorial Hospital	Alexandria	ON
Hôpital Notre-Dame Hospital	Hearst	ON
Hôpital Stella-Maris-de-Kent	Sainte-Anne-de-Kent	NB
Hornepayne Community Hospital	Hornepayne	ON
Hôtel-Dieu Saint-Joseph de Saint-Quentin	Saint-Quentin	NB
Humboldt District Health Complex	Humboldt	SK
Indian Head Union Hospital	Indian Head	SK
Innisfail Health Centre	Innisfail	AB
Invermere and District Hospital	Invermere	BC
Kamsack Hospital and Nursing Home	Kamsack	SK
Kelvington Hospital	Kelvington	SK
Kerrobert and District Health Centre	Kerrobert	SK
Killam Health Care Centre	Killam	AB
Kindersley and District Health Centre	Kindersley	SK
Kings County Memorial Hospital	Montague	PE
Kipling Integrated Health Centre	La Roche	SK
Kirkland Lake Hospital	Kirkland Lake	ON
Kitimat Regional Hospital (KGH)	Kitimat	BC
Kootenay Lake Hospital	Kootenay	BC
La Loche Community Health Centre - St Joseph's Hospital	La Loche	SK
La Ronge Health Centre	La Ronge	SK
Labrador Health Centre	Happy Valley-Goose Bay	NL
Labrador West Health Centre	Labrador City	NL
Lacombe Hospital and Care Centre	Lacombe	AB
Lady Minto Gulf Islands Hospital	Spring Island	BC
Lakes District Hospital and Health Centre	Burns Lake	BC
Lakeshore Hospital	Ashern	MB
Lanigan Hospital	Lanigan	SK
Leader and District Health Centre	Leader	SK
Lennox and Addington County General Hospital	Napanee	ON
Lillooet Hospital and Health Centre	Lillooet	BC
Listowel Memorial Hospital	Listowel	ON
Manning Community Health Centre	Manning	AB
Mayerthorpe Healthcare Centre	Mayerthorpe	AB
Meadow Lake Hospital	Meadow Lake	SK
Melfort Hospital	Melfort	SK
Melita Health Centre	Melita	MB
Mineral Springs Hospital	Banff	AB
Minnedosa Health Centre	Minnedosa	MB
Morris General Hospital	Morris	MB
Neepawa Health Centre (Memorial Hospital)	Neepawa	MB
New Waterford Consolidated Hospital	New Waterford	NS
Nicola Valley Health Centre	Merritt	BC
Nipawin Hospital	Nipawin	SK
Nipigon District Memorial Hospital	Nipigon	ON
North of Superior Healthcare Group	Marathon	ON
North Shore Health Network	Blind River	ON
Northside General Hospital	North Sydney	NS
Northern Haida Gwaii Hospital and Health Centre	Masset	BC
Northwest Health Centre	High Level	AB
Notre Dame Health Centre	Notre-Dame-de-Lourdes	MB
O'Leary Community Hospital	O'Leary	PE
Oilfields General Hospital	Black Diamond	AB
Olds Hospital and Care Centre	Olds	AB
Oromocto Public Hospital	Oromocto	NB
Our Lady of the Rosary Hospital	Castor	AB
Outlook and District Health Centre	Outlook	SK
Parkland Integrated Health Centre	Shellbrook	SK
Peace River Community Health Center	Peace River	AB
Pinawa Hospital	Pinawa	MB

** indicates a pediatric hospital respondent

Small Hospital Survey Respondents - less than 50 acute care beds (Continued)

Hospital	City	Province
Pincher Creek Health Centre	Pincher Creek	AB
Pine Falls Health Complex	Powerview-Pine Falls	MB
Ponoka Hospital and Care Centre	Ponoka	AB
Porcupine Carragana Hospital	Porcupine Plain	SK
Port McNeill and District Hospital	Port McNeill	BC
Prince Rupert Regional Hospital	Prince Rupert	BC
Princeton General Hospital	Princeton	BC
Provost Health Centre	Provost	AB
Qathet Hospital	Powell River	BC
Queen Elizabeth II Health Sciences Centre NSHA - Abbey Lane Hospital	Halifax	NS
Queen Victoria Hospital	Revelstoke	BC
Queens General Hospital	Liverpool	NS
Raymond Health Centre	Raymond	AB
Red Lake Margaret Cochenour Memorial Hospital	Red Lake	ON
Redvers Health Centre	Redvers	SK
Redwater Health Centre	Redwater	AB
Rimbey Hospital and Care Centre	Rimbey	AB
Riverside Health Complex	Turtleford	SK
Roblin Health Centre	Roblin	MB
Rock Lake Hospital	Crystal City	MB
Rocky Mountain House Health Centre	Rocky Mountain House	AB
Rosetown Health Centre	Rosetown	SK
Rosthern Hospital	Rosthern	SK
Russell Health Centre	Russell	MB
Sackville Memorial Hospital	Sackville	NB
Sacred Heart Community Health Centre	McLennan	AB
Sante Manitouwadge Health	Manitouwadge	ON
Sechelt Hospital	Sechelt	BC
Sensenbrenner Hospital	Kapuskasing	ON
Seton - Jasper Healthcare Centre	Jasper	AB
Shaunavon Hospital and Care Centre	Shaunavon	SK
Shuswap Lake General Hospital	Salmon Arm	BC
Slave Lake Healthcare Centre	Slave Lake	AB
Souris Health Centre	Souris	MB
Souris Hospital	Souris	PE
South Huron Hospital	Exeter	ON
South Okanagan General Hospital	Oliver	BC
Southeast Integrated Care Centre - Moosomin	Moosomin	SK
St Joseph's General Hospital	Vegreville	AB
St. John Hospital	Fort St. John	BC
St. Theresa General Hospital	Fort Vermilion	AB
St. Therese-St. Paul Healthcare Centre	St. Paul	AB
Ste. Anne Hospital	Ste-Anne	MB
Stettler Hospital and Care Centre	Stettler	AB
Stonewall and District Health Centre	Stonewall	MB
Strathmore District Health Services	Strathmore	AB
Sundre Hospital and Care Centre	Sundre	AB
Sussex Health Centre	Sussex	NB
Swan Hills Health Care Centre	Swan Hills	AB
Taber Health Centre	Taber	AB
Saint Anthony's General Hospital - The Pas Health Complex	The Pas	MB
Three Hills Health Centre	Three Hills	AB
Tiger Hills Health Centre	Treherne	MB
Tisdale Hospital	Tisdale	SK
Tofield Health Centre	Tofield	AB
Tofino General Hospital	Tofino	BC
Tri-Lake Health Centre	Killarney	MB
Trillium Health Partners - Queensway Health Centre	Mississauga	ON
Two Hills Health Centre	Two Hills	AB
Unity and District Health Centre	Unity	SK
Valleyview Health Centre	Valleyview	AB

** indicates a pediatric hospital respondent

Small Hospital Survey Respondents - less than 50 acute care beds (Continued)

Hospital	City	Province
Vermilion Health Centre	Vermilion	AB
Viking Health Centre	Viking	AB
Virden Hospital	Virden	MB
Vulcan Community Health Centre	Vulcan	AB
Wabasca/Desmarais Healthcare Centre	Wabasca-Desmarais	AB
Wadena Hospital	Wadena	SK
Wainwright Health Centre	Wainwright	AB
Weeneebayko Area Health Authority	Moose Factory	ON
West Nipissing General Hospital	Sturgeon Falls	ON
Western Hospital	Alberton	PE
Westlock Healthcare Centre	Westlock	AB
WestView Health Centre	Stony Plain	AB
Weyburn General Hospital	Weyburn	SK
Whitecourt Healthcare Centre	Whitecourt	AB
William J. Cadzow - Lac La Biche Healthcare Centre	Lac la Biche	AB
Wingham and District Hospital	Wingham	ON
Wrinch Memorial Hospital	Hazelton	BC
Wynyard Hospital	Wynyard	SK

50 to 200 beds

Hospital	City	Province
Aberdeen Regional Hospital ↔ Aberdeen Regional Hospital ↔ Sutherland Harris Memorial Hospital	New Glasgow	NS
Alberta Children's Hospital**	Calgary	AB
Battlefords Union Hospital	North Battleford	SK
Bethesda Regional Health Centre	Steinbach	MB
Boundary Trails Health Center	Winkler	MB
Carbonear General Hospital	Carbonear	NL
Central NL Regional Health Care Center	Grand Falls-Windsor	NL
CHEO (Children's Hospital of Eastern Ontario)**	Ottawa	ON
Colchester East Hants Health Authority ↔ Colchester East Hants Health Centre ↔ Lillian Fraser Memorial Hospital	Truro	NS
Collingwood General and Marine Hospital	Collingwood	ON
Concordia Hospital	Winnipeg	MB
Cumberland Regional Health Care Centre ↔ Cumberland Regional Health Care Centre ↔ North Cumberland Memorial Hospital ↔ South Cumberland Community Care Centre ↔ Bayview Memorial Health Centre ↔ All Saints Springhill Hospital	Amherst	NS
Cypress Regional Hospital	Swift Current	SK
Dartmouth General Hospital	Dartmouth	NS
Dauphin General Hospital	Dauphin	MB
Delta Hospital	Delta	BC
East Kootenay Regional Hospital	Cranbrook	BC
Dr FH Wigmore Regional Hospital	Moose Jaw	SK
Fort St. John Hospital and Health Centre	Fort St John	BC
Georgian Bay General Hospital	Midland	ON
Guelph General Hospital	Guelph	ON
Halton Healthcare - Milton District Hospital	Milton	ON
Hôpital régional d'Edmundston	Edmundston	NB
Huron Perth Healthcare ↔ Stratford General Hospital ↔ St. Mary's Memorial Hospital ↔ Seaforth Community Hospital ↔ Clinton Public Hospital	Stratford	ON
Institut de cardiologie de Montréal	Montréal	QC
James Paton Memorial Hospital	Gander	NL
Janeway Children's Health and Rehabilitation Centre**	St. John's	NL
Kootenay Boundary Regional Hospital	Trail	BC
Leduc Community Hospital	Leduc	AB

** indicates a pediatric hospital respondent

50-200 beds (Continued)

Hospital	City	Province
Lloydminster Hospital	Lloydminster	SK
Mills Memorial Hospital	Terrace	BC
Miramichi Regional Hospital	Miramichi	NB
Northern Lights Regional Health Centre	Fort McMurray	AB
Portage District General Hospital (Southern Health-Santé Sud)	Portage la Prairie	MB
Victoria Hospital	Prince Albert	SK
Prince County Hospital	Summerside	PE
Selkirk Regional Health Centre	Selkirk	MB
South Shore Regional Hospital	Bridgewater	NS
St Mary's Hospital	Camrose	AB
St. Clare's Mercy Hospital	St. John's	NL
St. Joseph's General Hospital [Elliot Lake]	Elliot Lake	ON
Sturgeon Community Hospital	St. Albert	AB
The North Island Hospital Campbell River and District Campus	Campbell River	BC
The North Island Hospital Comox Valley Campus	Courtenay	BC
Thompson General Hospital	Thompson	MB
Timmins & District Hospital - L'Hopital de Timmins et du district	Timmins	ON
Valley Regional Hospital	Kentville	NS
Victoria General Hospital	Winnipeg	MB
West Coast General Hospital	Port Alberni	BC
Western Memorial Regional Hospital	Corner Brook	NL
Wetaskiwin Hospital and Care Centre	Wetaskiwin	AB
Yorkton Regional Health Centre	Yorkton	SK

201 to 500 beds

Hospital	City	Province
Brandon Regional Health Centre	Brandon	MB
Brantford General Hospital	Brantford	ON
Burnaby Hospital LMPS	Burnaby	BC
Cape Breton Regional Hospital	Sydney	NS
Centre hospitalier universitaire Sainte-Justine**	Montréal	QC
Children's & Women's Health Centre of BC** ↔ BC Children's Hospital ↔ BC Women's Hospital and Health Center	Vancouver	BC
Chilliwack General Hospital ↔ Fraser Canyon ↔ Heritage Village	Chilliwack	BC
Chinook Regional Hospital	Lethbridge	AB
CHU Dr-Georges-L.Dumont Hospital ↔ Centre Hospitalier Universitaire Dr. George-L-Dumont ↔ Centre de sante des anciens combattants	Moncton	NB
CISSS de la Montérégie-Ouest- Hôpital Anna-Laberge	Châteauguay	QC
Cowichan District Hospital ↔ Cowichan District Hospital ↔ Chemainus Health Care Center ↔ Cairnsmore Place	Duncan	BC
Dr. Everett Chalmers Regional Hospital (DECRH)	Fredericton	NB
Grace Hospital	Winnipeg	MB
Grand Prairie Regional Hospital	Grande Prairie	AB
Grey Nuns Community Hospital	Edmonton	AB
Halton Healthcare - Oakville Trafalgar Memorial Hospital	Oakville	ON
Health Sciences Centre	St. John's	NL
Hôpital Montfort	Ottawa	ON
Hôpital Régional de Campbellton ↔ Hôpital Régional de Campbellton ↔ Centre Hospitalier Restigouche	Campbellton	NB
Institut universitaire de cardiologie et de pneumologie de Québec	Québec	QC
IWK Health Centre**	Halifax	NS
Joseph Brant Hospital	Burlington	ON
Langley Memorial Hospital	Langley	BC
Medicine Hat Regional Hospital	Medicine Hat	AB

** indicates a pediatric hospital respondent

201-500 beds (Continued)

Hospital	City	Province
Misericordia Community Hospital	Edmonton	AB
Mount Sinai Hospital - Sinai Health System	Toronto	ON
Nanaimo Regional General Hospital	Nanaimo	BC
Oak Valley Health ↔ Markham Stouffville Hospital ↔ Uxbridge Hospital ↔ Reactivation Centre	Markham	ON
Penticton Regional Hospital	Penticton	BC
Peterborough Regional Health Centre	Peterborough	ON
Queen Elizabeth Hospital	Charlottetown	PE
Queen Elizabeth II Health Sciences Centre NSHA - Victoria General Hospital	Halifax	NS
Queensway Carleton Hospital	Ottawa	ON
Red Deer Regional Hospital Centre	Red Deer	AB
Richmond General Hospital	Richmond	BC
Ridge Meadows Hospital	Maple Ridge	BC
Ross Memorial Hospital	Lindsay	ON
Royal Inland Hospital	Kamloops	BC
Saanich Peninsula Hospital	Saanichton	BC
Sault Area Hospital	Sault Ste Marie	ON
Seven Oaks General Hospital	Winnipeg	MB
South Health Campus	Calgary	AB
St. Boniface Hospital	Winnipeg	MB
The Moncton Hospital	Moncton	NB
University Health Network - Toronto General Hospital	Toronto	ON
University Health Network - Toronto Western Hospital	Toronto	ON
University Hospital of Northern BC (UHNBC)	Prince George	BC
Vernon Jubilee Hospital	Vernon	BC
Victoria General Hospital	Victoria	BC

500+ beds

Hospital	City	Province
Centre hospitalier de l'Université de Montréal (CHUM)	Montréal	QC
Centre universitaire de santé McGill (CUSM) ↔ Hôpital général de Montréal ↔ The Royal Victoria Hospital ↔ Le Neuro ↔ Hôpital de Montréal pour enfants	Montréal	QC
CHU de Quebec-Université Laval ↔ CHUL ↔ Hôtel-Dieu de Québec ↔ Hôpital du Saint-Sacrement ↔ Hôpital Saint-François d'Assise ↔ Hôpital de l'Enfant-Jésus	Québec	QC
CISSS de la Gaspésie ↔ Hôpital de Gaspé ↔ Hôpital de Maria ↔ Hôpital de Chandler ↔ Hôpital de Sainte-Anne-des-Monts	Gaspé	QC
CISSS de la Montérégie-Centre	Greenfield Park	QC
CISSS de la Montérégie-Est ↔ Hôpital Pierre-Boucher ↔ Hôpital Honoré-Mercier ↔ Hôtel-Dieu de Sorel	Longueuil	QC
CISSS de la Montérégie-Ouest- Hôpital du Suroît ↔ Hôpital du Suroît ↔ CHSLD Coteau-du-Lac (CDL) ↔ CHSLD Laurent Bergevin (LB) ↔ CHSLD de Rigaud ↔ CHSLD de Vaudreuil-Dorion ↔ CHSLD Docteur-Aimé-Leduc (DAL) ↔ CHSLD Cécile-Godin (CG) ↔ CHSLD d'Ormstown (CHO) ↔ CHSLD du Comté-de-Huntingdon (CHCH)	Châteauguay	QC
CISSS de Lanaudière ↔ Centre Hospitalier de Lanaudière ↔ Hôpital Pierre-Le Gardeur	Joliette	QC
CISSS de Laval ↔ Centre intégré de santé et de services sociaux de Laval (CISSS Laval)	Laval	QC

** indicates a pediatric hospital respondent

500+ beds (Continued)

Hospital	City	Province
CISSS de l'Outaouais ↔ Hôpital de Gatineau ↔ Hôpital de Hull ↔ Centre hospitalier Pierre-Janet ↔ CHSLD Lionel-Émond ↔ Maison des Aînés et alternative Parc-de-la-Montagne ↔ CHSLD Aylmer ↔ CHSLD La Pieta ↔ CHSLD de Gatineau ↔ Établissement de détention de Hull ↔ Centre réadaptation en dépendance de l'Outaouais ↔ Centre de réadaptation en déficience physique de l'Outaouais ↔ Hôpital et CHSLD de Papineau ↔ CHSLD Vallée-de-la-Lièvre ↔ CHSLD Petite-Nation ↔ CHSLD Champlain-de-Gatineau	Gatineau	QC
CISSS des Laurentides ↔ Hôpital de Mont-Laurier ↔ Centre multiservices de santé et de services sociaux de Rivière-Rouge ↔ Hôpital Laurentien ↔ Hôpital de Saint-Jérôme ↔ Hôpital de Saint-Eustache ↔ Centre d'hébergement Drapeau-Deschambault (Thérèse-de-Blainville)	Saint-Jérôme	QC
CISSS du Bas-Saint-Laurent ↔ Hôpital Notre-Dame-de-Fatima ↔ Hôpital Notre-Dame-du-Lac ↔ Hôpital régional Grand Portage ↔ Centre de santé et de services sociaux des Basques ↔ Hôpital régional Rimouski ↔ Hôpital de La Mitis ↔ Hôpital d'Amqui ↔ Hôpital de Matane	Rimouski	QC
CIUSSS de la Mauricie-et-du-Centre-du-Québec ↔ Hôtel-Dieu d'Arthabaska ↔ Hôpital Sainte-Croix ↔ Centre hospitalier affilié universitaire regional de Trois-Rivières ↔ Hôpital du Centre-de-la-Mauricie	Trois-Rivieres	QC
CIUSSS de l'Est-de-l'Ile-de-Montréal ↔ Maisonneuve-Rosemont ↔ Santa-Cabrini ↔ Institut Universitaire de santé mentale de Montréal	Montréal	QC
CIUSSS de l'Ouest de l'Ile de Montréal ↔ Hôpital général du Lakeshore ↔ Hôpital LaSalle ↔ Centre hospitalier de St-Mary	Montréal	QC
CIUSSS du Centre-Ouest-de-l'Ile-de-Montréal ↔ Hôpital général juif	Montréal	QC
CIUSSS du Centre-Sud-de-l'Ile-de-Montréal ↔ Institut Universitaire de Gériatrie de Montréal ↔ Centre de réadaptation en déficience physique Irglm ↔ Hôpital Notre-Dame ↔ Hôpital de Verdun	Montréal	QC
CIUSSS du Nord-de-l'Ile-de-Montréal ↔ Hôpital du Sacré-Coeur de Montréal ↔ Hôpital Jean-Talon ↔ Hôpital Fleury ↔ Centre d'hébergement Notre-Dame-de-la-Merci ↔ Centre multiservices de santé et de services sociaux Rivière-des-Prairies	Montréal	QC
CIUSSS du Saguenay-Lac-St-Jean ↔ Hôpital de La Baie ↔ Hôpital de Chicoutimi ↔ Hôpital de Jonquière et centre de réadaptation de Jonquière ↔ Hôpital d'Alma ↔ Hôpital de Dolbeau-Mistassini ↔ Hôpital de Roberval	Chicoutimi	QC
CIUSSS Estrie-CHUS	Sherbrooke	QC
Foothills Medical Centre	Calgary	AB
Health Sciences Centre Winnipeg	Winnipeg	MB
Health Sciences North / Horizon Santé-Nord	Sudbury	ON
Humber River Hospital	North York	ON
Kelowna General Hospital	Kelowna	BC
Lakeridge Health ↔ Ajax Pickering ↔ Bowmanville ↔ Oshawa ↔ Port Perry ↔ Whitby	Oshawa	ON

** indicates a pediatric hospital respondent

500+ beds (Continued)

Hospital	City	Province
Lions Gate Hospital	Vancouver	BC
London Health Sciences Centre ↔ University Hospital ↔ Victoria Hospital and Children's Hospital ↔ Verspeeten Family Cancer Centre	London	ON
Mackenzie Health ↔ Cortellucci Vaughan Hospital ↔ Mackenzie Richmond Hill ↔ Reactivation Centre MH	Richmond Hill	ON
Michael Garron Hospital - Toronto East Health Network	Toronto	ON
Niagara Health System	St. Catharines Niagara Falls Welland Fort Erie Port Colborne	ON
North York General Hospital	Toronto	ON
Peace Arch Hospital	White Rock	BC
Peter Lougheed Centre	Calgary	AB
Queen Elizabeth II Health Sciences Centre NSHA - Halifax Infirmary	Halifax	NS
Regina Hospitals ↔ Regina General Hospital ↔ Pasqua Hospital	Regina	SK
Rockyview General Hospital	Calgary	AB
Royal Alexandra Hospital	Edmonton	AB
Royal Jubilee Hospital	Victoria	BC
Saint John Regional Hospital ↔ Saint John Regional Hospital ↔ Centracare ↔ Riverside ↔ Grand Manan Hospital	Saint John	NB
Southlake Health	Newmarket	ON
St. Joseph's Healthcare Hamilton ↔ Charlton Campus ↔ West 5th Campus ↔ King Street Campus	Hamilton	ON
St. Paul's Hospital ↔ St. Paul's Hospital ↔ Mount St. Joseph's Hospital	Vancouver	BC
Sunnybrook Health Sciences Centre ↔ Bayview campus ↔ Orthopedic and Arthitis Centre ↔ St John's Rehab, RCC Church site	Toronto	ON
Surrey Memorial Hospital	Surrey	BC
The Ottawa Hospital ↔ General ↔ Civic ↔ Riverside	Ottawa	ON
Trillium Health Partners - Credit Valley Health	Mississauga	ON
Trillium Health Partners - Mississauga Hospital	Mississauga	ON
University of Alberta Hospital ↔ University of Alberta Hospital ↔ Stollery Children's Hospital ↔ Mazankowski Alberta Heart Institute	Edmonton	AB

** indicates a pediatric hospital respondent

Appendix III

Key Ratios

The key ratios tabulated below can be used to carry out a high-level comparison of a participating pharmacy department to those in similar hospitals across Canada, specifically for comparing pharmacy staffing, staffing ratios (specifically inpatient pharmacy technical staff to inpatient pharmacist Full Time Equivalents, [FTE's]) and inventory turnover rates. The ratios represent the average (or mean) of the results for the respondents in each subgroup (by teaching status or bed size) to allow pharmacy managers to compare their department to their closest peer group. Please note that unlike reports up to 2020/21, the ratios for acute care drug costs per patient day and non-acute care drug costs per non-acute care patient day are not included in this report. The responses provided for drug costs in E – Benchmarking were too low to create these ratios for this report. Hopefully in future surveys there will be more robust data and we can again provide these ratios. New with this survey report are the ratios for average FTE's per 100 acute care beds for various pharmacy staff.

Key Ratios 2023/24	All Hospitals	Pediatric Hospitals	Adult Hospitals					
			All Adult Hospitals	Bed Size			Teaching Status	
				50-200	201-500	>500	Teaching Hospitals	Non-teaching Hospitals
(n=)	(145)	(6)	(139)	(48)	(46)	(45)	(48)	(91)
Inpatient budgeted hours per acute patient day	**1.08**	**2.46**	**1.02**	**1.02**	**1.05**	**1.00**	**1.06**	**1.00**
(n=)	(145)	(6)	(139)	(48)	(46)	(45)	(48)	(91)
Inpatient budgeted hours per total (acute + non-acute) patient day	**0.86**	**2.38**	**0.79**	**4.59**	**5.71**	**4.16**	**5.35**	**4.02**
(n=)	(145)	(6)	(139)	(48)	(46)	(45)	(48)	(91)
Total (inpatient + outpatient) budgeted hours per acute patient day	**1.24**	**2.75**	**1.18**	**1.15**	**1.18**	**1.21**	**1.25**	**1.14**
(n=)	(145)	(6)	(139)	(48)	(46)	(45)	(48)	(91)
Total (inpatient + outpatient) budgeted hours per total (acute + non-acute) patient day	**0.98**	**2.67**	**0.91**	**0.97**	**0.97**	**0.77**	**1.00**	**0.86**

(n=)	(145)	(6)	(139)	(47)	(45)	(47)	(47)	(92)
Inpatient pharmacy technicians and pharmacy assistants to inpatient pharmacists (staff + advanced)	**1.51**	**1.18**	**1.53**	**1.72**	**1.38**	**1.48**	**1.43**	**1.58**

Key Ratios 2023/24	**All Hospitals**	**Pediatric Hospitals**	**Adult Hospitals**					
			All Adult Hospitals	**Bed Size**			**Teaching Status**	
				50-200	**201-500**	**>500**	**Teaching Hospitals**	**Non-teaching Hospitals**
(n=)	(132)	(6)	(126)	(43)	(43)	(40)	(42)	(84)
Pharmacist* vacancy rates (non-LOA)	**6.2%**	**4.2%**	**6.3%**	**12.7%**	**6.4%**	**5.4%**	**5.9%**	**6.8%**
(n=)	(132)	(6)	(126)	(43)	(43)	(40)	(42)	(84)
Pharmacist* vacancy rates (including LOA)	**9.3%**	**8.0%**	**9.3%**	**15.2%**	**7.1%**	**9.5%**	**8.1%**	**10.8%**
(n=)	(120)	(6)	(114)	(36)	(36)	(42)	(43)	(71)
Inventory turnover rate	**7.4**	**6.8**	**7.4**	**6.4**	**6.8**	**8.8**	**7.6**	**7.3**
(n=)	(147)	(6)	(141)	(50)	(49)	(48)	(48)	(93)
Average #FTEs per 100 acute care beds **Pharmacists (Staff + Advanced)**	**8.4**	**14.8**	**8.2**	**8.0**	**9.0**	**8.3**	**9.2**	**7.6**
(n=)	(145)	(6)	(139)	(50)	(48)	(47)	(47)	(92)
Average #FTEs per 100 acute care beds **Pharmacy technicians + pharmacy assistants**	**11.2**	**17.3**	**10.9**	**12.1**	**10.6**	**10.8**	**11.5**	**10.6**
(n=)	(148)	(6)	(142)	(51)	(49)	(48)	(48)	(94)
Average #FTEs per 100 acute care beds **All Pharmacy staff combined**	**20.7**	**33.9**	**20.2**	**21.2**	**20.7**	**20.3**	**21.9**	**19.3**

LOA = leave of absence; *Pharmacist vacancy rates includes both staff pharmacists and advanced practice pharmacists

**Average FTEs per 100 acute care beds is calculated using inpatient and outpatient FTEs combined, and using the number of acute care beds reported (not occupied beds).

Appendix IV

Definitions

Term	Definition
0.2 Full-Time Equivalent (FTE)	Assignment of a pharmacist to a program for a minimum of one day per week or for shorter periods that combine to the equivalent of one day per week, on average. For example, 0.2 FTE is equivalent to one pharmacist working one full day per week or two half-days per week.
Acute care	Provision, to a patient who has been formally admitted to a bed in a facility, of the necessary treatment for a disease or severe episode of illness for a short period. Patients are discharged from acute care as soon as they are healthy and their condition is stable. Note: Palliative care beds and alternate level of care (ALC) beds may be classified as acute or non-acute, according to how they are designated within a given facility.
Advanced Practice Pharmacist	A pharmacist who has advanced training beyond entry-to-practice requirements (e.g., post graduate PharmD, Clinical Master's [Quebec], Accredited Canadian Pharmacy Residency [ACPR or ACPR2] and/or certification [such as certification in pharmacotherapy from the Board of Pharmacy Specialties or from the Association des pharmaciens des établissements de santé du Québec]) and who spends most of their time addressing more complex clinical questions or working through more complex patient care challenges than typically handled by staff pharmacists. This designation may not be formally recognized in labour agreements.

Alternate level of care (ALC)	Care provided to a patient who is occupying a bed in a facility but does not require the intensity of resources/services usually provided in that care setting (whether acute care, chronic or complex continuing care, mental health care or rehabilitation). In this situation, the patient must be designated "ALC" by the most appropriate care team member (physician, long-term care [LTC] assessor, patient care manager, discharge planner or other care team member). For a patient with "ALC" designation in an acute care setting, discharge/transfer destinations may include but are not limited to: • home (with/without services); • designated/specialized mental health treatment facility; • chronic or complex continuing care (facility/bed within or outside reporting facility); and • long-term care (LTC) home. * The discharge or transfer destination need not be known at the time of ALC designation.
Automated dispensing cabinet (ADC)	A computer-driven mechanical system (e.g., Pyxis, Omnicell Technologies) located in a patient care area, which stores medications, controls their release to authorized personnel and captures all transaction information.
Best Possible Medication History (BPMH)	A complete medication history created using (1) a systematic process of interviewing the patient and/or the patient's family and (2) a review of at least one other reliable source of information to obtain and verify all of the patient's medication use (prescribed and non-prescribed). Complete documentation includes drug name, dosage, route and frequency (https://www.ismp-canada.org/medrec). Once generated, the BPMH is an important reference tool for reconciling medications at care transitions.
Budgeted hours	All staffing hours that are funded in the budget. If relief hours (e.g., for vacation or illness) are included in the budget, they should be counted as budgeted hours.
Centralized unit-dose system	A unit-dose system in which most medications for a specified time frame (e.g., 24 hours) are dispensed to the patient care unit from the central pharmacy.
Clinical decision support system	Feature of a computer program that provides automatic reminders, advice or interpretation as data are entered for a specific patient and/or a specific medication order. A clinical decision support system uses patient-specific data and evidence-based practice guidelines to generate alerts and/or suggested courses of action.

Closed loop electronic medication management system	A fully electronic medication management process, in which all relevant information is documented seamlessly, encompassing prescribing, pharmacy verification, smart infusion pumps, automated dispensing cabinets, barcoded medication administration (BCMA), and anything that has electronic or digital medicine datasets or encompasses medication management processes.
Complex continuing care	The delivery of medically complex, specialized services (e.g., ventilation therapy) to patients of any age, over extended periods of time.
Computerized provider order entry (CPOE)	Process whereby a healthcare provider enters medication orders or other instructions electronically, rather than on paper charts
Controlled/carded dose system	A drug distribution system in which most medications are packaged in blister cards containing up to a one- month supply of medication. A pharmacist usually reviews and approves the medication order before a patient-specific label is applied to the card and the card is delivered to the patient.
Decentralized unit-dose system	A unit-dose system in which most medications are distributed from either an automated dispensing cabinet (ADC) or a satellite pharmacy located on the patient care unit.
Electronic Health Record (EHR, also referred to as EMR)	A longitudinal electronic record of patient health information generated as a result of one or more encounters in any care delivery setting. Included in this record are patient demographic characteristics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. The EHR system has the ability to generate a complete record of a clinical patient encounter, as well as supporting other care- related activities, directly or indirectly, through the interface, including evidence-based decision support, quality management and outcomes reporting.
Full-Time Equivalent (FTE)	A standardized counting unit, whereby the annual number of budgeted hours for a full-time employee (e.g., 2,015 hours) is equivalent to 1 FTE. For example, if the total number of budgeted hours for all pharmacists in a given fiscal year is 20,150, and the number of hours budgeted for a full-time pharmacist is 2,015, the number of FTEs would be 10. Budgeted casual and relief hours should be included in the calculation of FTEs.

Healthcare Information and Management Systems Society (HIMSS) classification	The HIMSS Analytics Electronic Health Record Adoption Model (EMRAM) incorporates methodology and algorithms to automatically score hospitals around the world relative to their electronic health record (EHR) capabilities. This eight-stage model (in which stages are designated from 0 to 7) measures the adoption and utilization of various EHR functions. **Stage 7** Complete EHR; external electronic health information exchange (HIE); data analytics, governance, disaster recovery, privacy and security **Stage 6** Technology-enabled medication, blood products and human milk administration; risk reporting; full clinical decision support **Stage 5** Physician documentation using structured templates; intrusion/device protection **Stage 4** CPOE with clinical decision support; nursing and allied health documentation; basic business continuity **Stage 3** Nursing and allied health documentation; electronic medication administration record (eMAR); role-based security **Stage 2** Clinical data repository; internal interoperability; basic security **Stage 1** Ancillaries: laboratory, pharmacy and radiology/cardiology information systems; picture archiving and communication system; Digital non-DICOM image management **Stage 0** Ancillaries not installed
Home Hospital Virtual Care	A virtual inpatient unit that allows eligible patients to receive the care and treatment they would receive in a hospital, but now provided within a personal or family residence.
Hospital Information System (HIS)	A hospital information system (HIS) refers to an electronic system designed to manage healthcare data generated during a patient's hospital encounter. It is a comprehensive information system used to collect, store, process, retrieve, and communicate patient care and administrative information for all hospital-affiliated activities and to satisfy the functional requirements of all authorized users in the healthcare setting.
Inventory turnover ratio	A measure of a facility's efficiency of inventory management, calculated as follows: total annual drug expenses / average inventory value. If only a single inventory count is done in a year, efforts should be made to ensure that the inventory count is as representative as possible of the average inventory value.
IV workflow management systems	A technology system that identifies medications for compounding typically through bar code scanning, standardized compounding processes, photo capture (volumetric) or measurement of specific gravity or density (gravimetric) documentation for verification.

Long-term care (LTC)	Care to address the needs of patients who require nursing and personal care on a continuing basis. These patients usually have disabilities or chronic care needs, with a range of medical and/or social services being offered. The services are generally provided in residential facilities (e.g., nursing homes or assisted living facilities).
Medication counselling	A process involving direct interaction between the patient and an appropriate caregiver, during which the patient's medications are reviewed and the patient is provided with education concerning the safe and appropriate use of all medications.
Medication reconciliation	A formal process of (1) obtaining a complete and accurate list of each patient's current home medications, including name, dosage, route and frequency; (2) using that list when writing admission, transfer and/or discharge orders; and (3) comparing the list against the patient's admission, transfer and/or discharge orders, identifying any discrepancies, bringing them to the attention of the prescriber and, if appropriate, making changes to the orders. Any resulting changes in orders are documented.
Mental health care	Care to address the needs of patients with mental illness. In the mental health care setting, the focus is on observing and providing care and treatment for patients who are experiencing; mental health disorders. *Do not include mental health beds if they are in a separate, designated psychiatric facility.*
Monitoring	Ongoing review of all pertinent patient data (e.g., diagnoses, laboratory values, medications) and evaluation of the patient's response to therapy. The routine drug profile review that pharmacists perform at the time of order entry or order review does not, on its own, fulfill the criteria for monitoring.
National Association of Pharmacy Regulatory Authorities (NAPRA) and Ordre des pharmaciens du Québec (OPQ) standards	Model Standards for Pharmacy Compounding of Non-hazardous Sterile Preparations and Model and Standards for Pharmacy Compounding of Hazardous Sterile Preparations, which have been endorsed by NAPRA, or the standards of the OPQ (Norme 2014.01, for sterile compounding of non-hazardous products; Norme 2014.02, for sterile compounding of hazardous products).
Night cabinet or cupboard	A secured medication storage area that is used to support medication distribution when the pharmacy is closed.
Non-acute care	Inpatient care that is not of an acute nature, encompassing the following types of care: long-term care (LTC), rehabilitation, chronic care and complex continuing care. Note: Palliative care beds and alternate level of care (ALC) beds may be classified as acute or non-acute, according to how they are designated within a given facility.

Palliative care	Care to address the needs of patients with life-limiting conditions. In the palliative care setting, the focus is on improving quality of life for the patient and their family/ loved ones. Improving quality of life begins with identifying, assessing and alleviating pain and other physical, psychosocial and spiritual issues.
Patient care program	Healthcare delivery that is formally structured to service a group of patients with similar healthcare needs (e.g., child health program, mental health program, critical care program). A formal patient care program will usually have a physician and/or nurse as the leader or director. This can include off-site services.
Pharmacist Manager	A pharmacist who is responsible for managing one or more sites or functional areas and who is responsible for hiring, performance reviews, discipline and dismissal of designated staff members who report directly.
Pharmacy Assistant	An individual who is not "registered", "listed" or "licensed" by a provincial regulatory body (college), who works under the direct supervision of a pharmacist or a pharmacy technician to assist with various functions.
Pharmacy Assistant Manager	A pharmacy assistant who is responsible for managing one or more sites or functional areas and who is usually responsible for hiring, performance reviews, discipline and dismissal of designated staff members who report directly.
Pharmacy information system (PIS)	A computer system (e.g., BDM, Cerner, Meditech, EPIC) that is used by the pharmacy to maintain an accurate record of drug dispensing activity, patient medication profiles and other relevant patient information. Reports generated from a PIS are used to track drug costs by patient or patient care unit, drug utilization patterns, and other pertinent data.
Pharmacy Manager (neither a pharmacist nor a pharmacy technician nor a pharmacy assistant)	A manager who is not a pharmacist or a pharmacy technician or a pharmacy assistant, but who has the same scope of responsibilities as a pharmacist manager (i.e., is responsible for managing one or more sites or functional areas and is responsible for hiring, performance reviews, discipline and dismissal of designated staff members who report directly).
Pharmacy Practice model	The method by which pharmacy department resources are used to provide patient care services and the outcomes that are intended to be achieved as a result of that model of resource utilization. A pharmacy department's practice model specifies the roles played by pharmacists, pharmacy technicians, pharmacy assistants and students, as well as the application of information technologies and automation technologies.

Pharmacy Technician	For the purposes of this survey, the term "Pharmacy Technician" means those who are "registered", "listed" or "licensed" by a provincial regulatory body (college). In Quebec this definition includes those who have completed the Diploma of Collegial Studies (Diplôme d'études collégiales, DEC) Pharmacy Technician.
Pharmacy Technician Manager	A pharmacy technician who is responsible for managing one or more sites or functional areas and who is usually responsible for hiring, performance reviews, discipline and dismissal of designated staff members who report directly.
Practice Leader / Coordinator	A pharmacist who possesses a high level of content expertise in a particular clinical practice area and who supervises, trains and acts as a clinical resource for other pharmacists and/or technicians who work in the particular clinical area (e.g., Practice Leader – Pediatrics, Coordinator – Clinical Pharmacy Services).
Rehabilitation	Care to address the needs of patients who have been disabled by disease or injury. In the rehabilitation setting, patients receive combined and coordinated care through the provision of medical, social, educational and vocational measures for training or re-training, in an effort to restore the patients to their highest possible level of functional ability.
Repeater pump or automatic syringe filler	A peristaltic pump that is used for accurately transferring aliquots of fluid from one container to another (e.g., from a bag to a syringe).
Robotic automation	An automated system (e.g., Robot-Rx, PillPick, BoxPicker) in which a robotic arm selects the correct drug from racks holding pre-packaged unit-dose medications in the form of tablets, capsules, syringes, pre- packaged liquids, vials, ampoules or patches. Barcoding systems are used to verify items that have been selected from the shelving racks by the robotic arm.
Segregated ISO Class 7 clean room	A clean room is an environment with a controlled level of contamination that is described in terms of the concentration of non-viable particles per cubic meter at a specified particle size. A Class 7 clean room has a maximum number of particles (≥ 0.5 µm in size) of 352,000/m3.
Segregated ISO Class 8 ante-room	An ante-room is a buffer room between a normal room and a clean room. Like a clean room, an ante-room has a controlled level of contamination that is described in terms of the concentration of non-viable particles per cubic meter at a specified particle size. A Class 8 ante-room has a maximum number of particles (≥ 0.5 µm in size) of 3,520,000/m3. For hazardous product preparation, the Anteroom needs to meet ISO Class 7 requirements.
Smart pump	Infusion pump with a programmable drug library, including clinical alerts related to drug dose and rate, as well as the ability to store and download usage data for quality assurance, education and safety purposes.

Staff Pharmacist	A pharmacist who holds a licence to practice pharmacy and who participates in the delivery of drug distribution and/or clinical services (excluding pharmacists in management positions and any pharmacists who have been designated as Advanced Practice Pharmacists).
Support Personnel (Clerical / Porter / Aide)	Individuals who perform clerical duties, deliver medications and supplies, and perform similar duties that do not involve direct participation in the selection, re-packaging, labelling and inventory management of pharmaceuticals.
TALLman lettering	The use of uppercase letters (capitalization) to enhance the unique letters of a medication's generic drug name (e.g., DOXOrubicin, HYDROmorphone, OXYcodone, inFLIXimab, NIFEdipine, DULoxetine) to reduce errors caused by potential confusion between drug products with look-alike drug names.
Total wardstock system	A drug distribution system in which most medications are stocked on the patient care unit in bulk containers, from which medications can be removed and administered to patients without a pharmacist having to first review and approve the medication order for each specific patient.
Traditional drug distribution system	A drug distribution system in which most medications are labelled and dispensed in multi-dose, patient- specific vials or similar medication containers, after a pharmacist has reviewed and approved the medication and dosage ordered for each specific patient.
Unit-dose system	A drug distribution system in which medications are packaged and dispensed to the patient care unit in a single-dose, ready-to-administer form. A unit-dose system may be centralized or decentralized.

Appendix V

Survey Questions

Hospital Pharmacy in Canada Survey 2023/24 :
https://www.cshp.ca/HPCS-Qs-ENG