Assessing Hospital Pharmacists' Scope of Clinical Practice in Ontario

Sarah Tessier, Victor Tsang, and Spencer Martin

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ABSTRACT

Background: Expansion of the scope of pharmacists' activities in hospital is associated with reductions in adverse events and drug-related readmissions. However, the breadth of hospital pharmacists' clinical activities varies widely across Ontario due to provisions in the provincial *Public Hospitals Act*. Few data exist defining expanded scope in institutions across Ontario.

Objectives: The primary objective was to describe the scope of practice of hospital pharmacists in Ontario who were undertaking expanded clinical activities based on policies or medical directives. The secondary objectives included determining benefits, limitations, facilitators, and barriers associated with implementing these activities.

Methods: A survey was sent to the pharmacy leadership of Groups A and B public hospitals across Ontario. The survey contained quantitative and qualitative questions focused on 3 domains of expanded-scope activities: adaptation, discontinuation, and renewal of medication orders; prescriptive authority; and drug monitoring.

Results: Of 56 hospitals invited, 46 (82%) submitted a survey response, with 1 exclusion (due to no response on some mandatory questions). The most common expanded-scope activity was independent performance of therapeutic drug monitoring (71%, 32/45). Pharmacists had the authority to independently adapt, discontinue, or renew inpatient medication orders in 60% (27/45) of hospitals, and could independently initiate medication orders in 20% (9/45). Barriers to implementing expanded-scope activities included limited time and staffing. Facilitators included proactive leadership, demonstrated clinical value, and strong rapport with other health care providers.

Conclusions: Many institutions in Ontario have established polices to expand pharmacists' clinical activities, but there is a great deal of variability in scope of practice. Advocacy at the provincial level to unify scope of practice will help to optimize patient outcomes.

Keywords: pharmacist scope of practice, hospital pharmacy, expanded scope, Ontario

RÉSUMÉ

Contexte : L'expansion du champ d'activité des pharmaciens à l'hôpital est associée à une réduction des événements indésirables et des réadmissions liées aux médicaments. Cependant, l'étendue des activités cliniques des pharmaciens d'hôpitaux en Ontario varie considérablement en raison des dispositions de la *Loi sur les hôpitaux publics* de l'Ontario. Il existe peu de données définissant une portée élargie dans les établissements de l'Ontario.

Objectifs : L'objectif principal consistait à décrire le champ d'exercice des pharmaciens d'hôpitaux en Ontario qui entreprenaient des activités cliniques élargies en fonction de politiques ou de directives médicales. Les objectifs secondaires comprenaient la définition des avantages, des limites, des facilitateurs et des obstacles associés à la mise en œuvre de ces activités.

Méthodes : Un sondage a été envoyé aux responsables des pharmacies des hôpitaux publics des groupes A et B de l'Ontario. Il comprenait des questions quantitatives et qualitatives axées sur 3 domaines d'activités liés à une portée élargie : l'adaptation, l'interruption et le renouvellement des ordonnances de médicaments; le pouvoir prescriptif; et la surveillance des médicaments.

Résultats : Sur 56 hôpitaux invités, 46 (82 %) ont soumis une réponse au sondage, avec 1 exclusion (en raison de l'absence de réponse à certaines questions obligatoires). L'activité à portée élargie la plus courante était la réalisation indépendante de la surveillance thérapeutique des médicaments (32/45, 71 %). Les pharmaciens avaient la capacité d'adapter, d'interrompre ou de renouveler de manière indépendante les ordonnances de médicaments pour les patients hospitalisés dans 60 % (27/45) des hôpitaux, et pouvaient les initier de manière indépendante dans 20 % (9/45) des hôpitaux. Les obstacles à la mise en œuvre d'activités à portée élargie comprenaient le manque de temps et de personnel. Les éléments facilitant la mise en œuvre d'activités à portée élargie comprenaient le leadership proactif, la valeur clinique démontrée et les relations solides avec les autres prestataires de soins de santé.

Conclusions : De nombreux établissements en Ontario ont établi des politiques liées à l'expansion des activités cliniques des pharmaciens, mais il existe une grande variabilité dans le champ d'exercice. Le plaidoyer au niveau provincial pour unifier le champ de pratique contribuera à optimiser les résultats pour les patients.

Mots-clés : champ d'exercice des pharmaciens, pharmacie hospitalière, champ d'exercice

INTRODUCTION

The role of the pharmacist is evolving globally, and Canada is no exception.[1,2] To meet the needs of an overburdened and underfunded Canadian health care system, hospital pharmacists have left behind the conventional model of drug distribution to embrace an expanded scope of practice. Updated regulations have authorized pharmacists in many jurisdictions to independently perform therapeutic drug monitoring, write new medication orders, and adapt existing prescriptions. Preliminary data have shown that this shift has increased access to and quality of care by optimizing the role of the pharmacist as the medication expert.[3] For example, a study in the United States found that hospitals with 7 pharmacist-led clinical activities, including adverse drug monitoring and drug-use evaluation, had significantly lower adjusted mortality rates relative to hospitals without these activities.[4] A randomized controlled trial conducted in a Swedish hospital found that pharmacist interventions decreased health care costs by reducing drug-related readmissions.[5]

Despite these clear benefits, the breadth of expanded-scope clinical activities undertaken by pharmacists in Canada varies widely by province/territory and area of care. This lack of standardization is due to health care activities being governed primarily at provincial/territorial levels rather than federally.[6] The current gold standard in this regard is Alberta, where pharmacists can independently initiate prescriptions for any Schedule I medications, order laboratory tests for drug and disease state monitoring, perform therapeutic substitutions, and administer any drug or vaccine by injection.[7-10] Furthermore, because the province is governed by a single health authority, pharmacists' scope of practice is the same in both community and hospital settings.[11]

In contrast, pharmacists' expanded-scope activities in Ontario are limited to adapting existing prescriptions, renewing prescriptions for continuity of care, and initiating prescriptions for smoking cessation and 19 minor ailments.[12,13] These expanded-scope activities are restricted to pharmacists practising in the community setting unless otherwise set out by an individual hospital's medical advisory committee, in the form of a policy or medical directive, as per Ontario's *Public Hospitals Act*.[14] This situation has led to differences in clinical activities undertaken by hospital pharmacists across Ontario.

A literature search was conducted to determine the current state of pharmacists' expanded-scope activities in hospitals across Ontario. Most studies pertained to the scope of prescribing by pharmacists, including a 2019 provincial survey by Vuong and others[15] assessing the readiness for, barriers to, and facilitators of prescription modification by hospital pharmacists. The Canadian Society of Hospital Pharmacists routinely publishes data collected from surveys on pharmacist practice in the hospital setting. The most recently available report, from a survey conducted in 2021, included a section on the profile of clinical pharmacy activities in hospitals, but no information was collected on the policies and medical directives that made these activities possible.[16] To our knowledge, no single source has tried to define the expanded scope of practice activities occurring in the various hospitals in Ontario.

To fill this gap in the literature, a province-wide survey was conducted with the primary objective of categorizing the types of expanded-scope activities being performed by hospital pharmacists in Ontario on the basis of policies or medical directives. Secondary objectives were to gather data regarding benefits, limitations, facilitators, and barriers related to expanded-scope pharmacist practice activities.

METHODS

A link to a web-based survey was sent to the clinical coordinators of hospital pharmacy departments across Ontario. In centres where the role of clinical coordinator did not exist, the pharmacy manager or director was enlisted to complete the survey. Hospitals were reached by telephone to determine the name and contact information of the pharmacy clinical coordinator, manager, or director if this information was not publicly available online. The initial invitation to participate was extended by email and included a link to the online research platform used to design and administer the survey, REDCap (Research Electronic Data Capture). To encourage participation, pharmacy departments that completed the survey were eligible to receive a $200 Tim Hortons gift certificate, funded by the study investigators and selected at random. Responses were gathered from May 2 to July 6, 2022. Reminder emails were sent at the 2- and 5-week time points, as well as 2 days before the deadline. A follow-up phone call was made at the 7-week mark to the pharmacy department of any hospitals that had not yet completed the survey to provide a reminder, as well as an opportunity to ask questions and ascertain barriers to survey completion.

Only institutions classified as Group A or Group B according to Ontario's *Public Hospitals Act* were eligible for the survey, as they most closely reflected the size and function of London Health Sciences Centre, the institution conducting the survey. Group A hospitals are defined as facilities where training is provided to medical students, and Group B hospitals are centres with at least 100 acute care beds.[14] A total of 56 hospitals meeting the study inclusion criteria were identified from data published by the Ontario Ministry of Health and Long-term Care: 16 institutions meeting the criterion for Group A and 40 meeting the criterion for Group B.[17] For hospitals with multiple sites, a single response was collected. From the total of 56 centres identified, a sample size of 48 was calculated to be representative for purposes of the survey, with a confidence

interval of 95% and a margin of error of 5%. Hospitals were excluded if they were not classified as Group A or Group B under the *Public Hospitals Act*.

No existing validated survey could be identified for use. A survey was therefore developed specifically for the purposes of this study, containing a mix of quantitative and qualitative questions. The final survey tool was divided into 8 sections with a total of 25 questions (Appendix 1). In the first section, eligibility was confirmed by means of an unnumbered question. The second section gathered relevant information about the hospital, including bed count, employment numbers, and pharmacy practice model. Based on our literature review, 4 pharmacy practice models were listed and described: the distributive model, in which pharmacists primarily perform drug distribution tasks; the generalist model, in which pharmacists have both distributive and clinical responsibilities during each shift; the separate model, in which pharmacists exclusively perform either distributive or clinical tasks; and the clinical model, in which pharmacists perform primarily clinical activities, with few to no distribution tasks. The subsequent sections gathered data about the types of expanded-scope activities available to pharmacists. Based on our literature review, 3 domains of pharmacist activity were listed: adaptation, discontinuation, and renewal of inpatient medication orders; prescriptive authority; and drug and disease state monitoring.[10,18] Within each domain, an initial question assessed whether the activity was currently performed by pharmacists in the institution. Follow-up questions were used to further define the extent of activities allowed. A Likert-type scale was used to gather answers to questions about anticipated facilitators of and barriers to expansion of the pharmacist's scope of practice activities, along with open-ended qualitative questions. Of the 25 questions, 6 were mandatory, and responses were excluded from analysis if one or more of the mandatory questions were not completed. The study was approved by the Lawson Ethics Board. By submitting responses to the survey questionnaire, participants implied their free and informed consent.

Validity of the survey was assessed by a variety of methods. Five pharmacy professionals (4 hospital pharmacists and 1 pharmacy researcher) were identified from existing contacts as subject matter experts. They were asked to complete the survey and provide feedback on length, organization, and user-friendliness of the questions. On the basis of their initial review, 2 questions were added in the hospital information section (about numbers of full- and part-time pharmacists employed per hospital). An additional question was added to the "pharmacist prescriptive authority" section to ascertain whether pharmacists could independently prescribe any schedule I drug versus only selected medications/drug classes. A similar addition was made in the "pharmacist drug and disease state monitoring" section to ascertain the scope of prescribing laboratory tests. The survey was then sent to the clinical coordinators at the London Health Sciences Centre and the St Thomas Elgin General Hospital to test the terminology, relevance, and completeness of the questions. Open-ended questions regarding facilitators and barriers were rewritten, and the overall number of questions was reduced to decrease the response burden.

The response rate for the survey was calculated by dividing the number of responses gathered by the total number of eligible hospitals. The Likert-scale responses were converted to numeric values for data analysis. Descriptive statistics were used to analyze the results. For all mandatory survey questions, Group A and Group B hospitals were analyzed separately, to gauge differences in practice associated with teaching centre affiliation. Responses to the open-ended questions were reviewed by a single member of the study team (S.T.), and key ideas were grouped into themes. A thematic analysis was not conducted, given the limited amount of data obtained from responses to the open-ended questions.

RESULTS

Of the 56 institutions surveyed, 46 (82%) responded, but 1 response was excluded from the data analysis due to failure to complete all mandatory questions. Thirteen (81%) of the 16 Group A hospitals and 32 (80%) of the 40 Group B hospitals completed the survey, which indicates that the results were highly representative for both groups.

Among respondents from both Group A and Group B hospitals, the most frequently reported pharmacy practice model was the generalist model (62% and 53%, respectively), followed by the clinical model (38% for both groups) (Table 1). Only Group B hospitals (9%) reported using the separate model. Most Group A respondents had more than 500 acute care beds, whereas most Group B

TABLE 1. Baseline Characteristics of Responding Institutions

Characteristic	Hospital Group; No. (%) of Respondents	
	Group A (*n* = 13)	Group B (*n* = 32)
No. of acute care beds		
100–200	3 (23)	11 (34)
201–500	3 (23)	17 (53)
> 500	7 (54)	4 (13)
Pharmacy practice model		
Distributive	0 (0)	0 (0)
Generalist	8 (62)	17 (53)
Clinical	5 (38)	12 (38)
Separate	0 (0)	3 (9)

TABLE 2. Pharmacists' Expanded-Scope Activities

Pharmacist Activity, by Survey Section	Hospital Group; No. (%) of Respondents		
	All (*n* = 45)	Group A (*n* = 13)	Group B (*n* = 32)
Adaptation, discontinuation, and renewal of inpatient medication orders, as per policies or medical directives	27 (60)	7 (54)	20 (63)
Changing dose, dosage form, route of administration for any medication order	16 (36)	3 (23)	13 (41)
Performing dose adjustments based on renal function	23 (51)	4 (31)	19 (59)
Performing dose adjustments based on age and weight	13 (29)	3 (23)	10 (31)
Renewing patient's home medications	8 (18)	3 (23)	5 (16)
Discontinuing patient's home medications	15 (33)	3 (23)	12 (38)
Discontinuing duplicate therapy	13 (29)	2 (15)	11 (34)
Other[a]	13 (29)	5 (38)	8 (25)
Adapting antibiotic orders	5 (11)	1 (8)	4 (13)
Adapting warfarin orders	2 (4)	1 (8)	1 (3)
Adapting dose, dosage form, or route of administration for patient's home medications	1 (2)	0 (0)	1 (3)
Adapting any medication order based on therapeutic drug levels	1 (2)	0 (0)	1 (3)
Discontinuing and renewing any medication order pre- or post-operatively	2 (4)	2 (15)	0 (0)
Discontinuing any non-essential medication order	1 (2)	1 (8)	0 (0)
Discontinuing orders for complementary and alternative medicines	2 (4)	0 (0)	2 (6)
Prescribing of new inpatient medication orders, as per policies or medical directives	9 (20)	5 (38)	4 (13)
Independently writing new medication orders for any Schedule I medication	0 (0)	0 (0)	0 (0)
Independently writing new medication orders for only selected medications or drug classes	9 (20)	5 (38)	4 (13)
Specific drug classes independently prescribed by pharmacists			
Antibiotics	3 (7)	0 (0)	3 (9)
Anticoagulants	4 (9)	3 (23)	1 (3)
Antidepressants	0 (0)	0 (0)	0 (0)
Contraceptives	0 (0)	0 (0)	0 (0)
Other[a]	5 (11)	3 (23)	2 (6)
Select Schedule II medications	1 (2)	1 (8)	0 (0)
Zoledronic acid	2 (4)	2 (15)	0 (0)
Oseltamivir	1 (2)	1 (8)	0 (0)
Heart failure medication (for titration)	1 (2)	0 (0)	1 (3)
Nicotine replacement therapy	1 (2)	0 (0)	1 (3)
Therapeutic drug monitoring, as per policies or medical directives	32 (71)	6 (46)	26 (81)
Vancomycin monitoring	30 (67)	5 (38)	25 (78)
Aminoglycoside monitoring	29 (64)	5 (38)	24 (75)
Warfarin monitoring	17 (38)	5 (38)	12 (38)
Other[a]	7 (16)	3 (23)	4 (13)
Any medication requiring therapeutic drug monitoring	2 (4)	1 (8)	1 (3)
Any medication requiring renal or hepatic dose adjustment	1 (2)	1 (8)	0 (0)
Anti-epileptics	3 (7)	1 (8)	2 (6)
Heart failure medications	1 (2)	0 (0)	1 (3)
Disease state monitoring, as per policies or medical directives	8 (18)	3 (23)	5 (16)
Independently ordering and interpreting any laboratory test	4 (9)	2 (15)	2 (6)
Independently ordering and interpreting only selected laboratory tests	3 (7)	0 (0)	3 (9)
Specific laboratory tests			
Electrolytes	2 (4)	0 (0)	2 (6)
Serum creatinine	3 (7)	0 (0)	3 (9)
Other[a]	1 (2)	0 (0)	1 (3)
Complete blood count	1 (2)	0 (0)	1 (3)
Albumin	1 (2)	0 (0)	1 (3)
C-reactive protein	1 (2)	0 (0)	1 (3)

[a]Respondents could enter multiple answers in the "Other" category.

hospitals had between 201 and 500 beds. The mean number of full-time pharmacists in Group A institutions was 37 (range 9–100), whereas the mean number of part-time pharmacists was 9 (range 2–25). For Group B institutions, means of 19 (range 1–65) full-time and 8 (range 0–35) part-time pharmacists were employed.

Overall, 60% of respondents had policies or medical directives in place allowing for independent adaptation, renewal, or discontinuation of inpatient medication orders by pharmacists (Table 2). This proportion was similar between Group A and Group B hospitals (54% and 63%, respectively). The most frequently reported activity for Group B hospitals was renal dose adjustment (59%) followed by changes to the dose, dosage form, or route of administration for any medication order (41%). In contrast, only 23% of Group A hospitals had policies in place allowing pharmacists to change the dose, dosage form, or route of administration. Overall, 20% of the hospitals reported that pharmacists could independently write new inpatient medication orders. This proportion was higher for Group A than Group B hospitals (38% and 13%, respectively). In all hospitals, pharmacists could only write orders for selected classes of medications, most commonly antibiotics for Group B hospitals (9%) and anticoagulants for Group A hospitals (23%). Other medications that could be prescribed included nicotine replacement therapy, vaccines, selected Schedule II products, zoledronic acid, oseltamivir, and agents used for the optimization of heart failure therapy. Pharmacists in 71% of responding institutions could independently order laboratory tests for drug monitoring, most commonly vancomycin and aminoglycosides. This number was driven mostly by Group B hospitals (81%), with a much lower proportion for Group A hospitals (46%). Thirty-eight percent of hospitals had policies/medical directives in place allowing pharmacists to independently order testing for international normalized ratio for purposes of warfarin monitoring. Other classes of medications covered by policies were anti-epileptics and digoxin. Eighteen percent of the hospitals had policies/medical directives to help pharmacists with independent disease state monitoring. Of these, half allowed pharmacists to independently order any laboratory test. The remaining centres had policies in place only for specific tests, such as electrolytes, serum creatinine, C-reactive protein, albumin, and complete blood count.

Information on the number and types of ambulatory care clinics was gathered to characterize pharmacists' expanded-scope practices in hospital outpatient care. Group A centres had a mean of 34 clinics, and Group B centres had a mean of 7 clinics. Oncology ambulatory care clinics were supported by policies/medical directives expanding pharmacists' scope of practice in 36% (16/45) of centres; nephrology clinics were the second most common (24%, 11/45).

A total of 43 respondents completed the benefits and limitations section of the survey. Of these, 35 (81%) "strongly agreed" that expanded-scope activities allowed pharmacists to improve outcomes for patients, and 29 (67%) "strongly agreed" that expanded-scope activities allowed pharmacists to perform their job more efficiently by decreasing medication turnaround time. This perception of improved efficiency is likely related to various factors such as decreased need to page or call other health care providers during order verification. Another benefit was a decrease in adverse effects, which 29 respondents (67%) "strongly agreed" were prevented by pharmacists' expanded-scope activities. Policies expanding pharmacists' scope of practice can prevent adverse effects through discontinuation of duplicate medication orders, correct ordering of home medications, adjustment of medications for renal or hepatic function, and provision of close monitoring for drugs with a narrow therapeutic window. Beyond these patient care benefits, increased job satisfaction was also reported (27 [63%] "strongly agreed"). Furthermore 23 (53%) of respondents "disagreed" that communication and collaboration with other health care providers was reduced by expansion of pharmacists' scope of activities, and many respondents (34 [79%]) "agreed" that expansion of the pharmacist's role was supported by other health care providers.

Qualitative, open-ended questions were used to gather data about facilitators of and barriers to the expansion of pharmacists' scope of practice using policies/medical directives. The presence of a clinical pharmacist on the unit was reported as a factor that facilitated policy implementation because it demonstrates the value of a pharmacist's intervention and facilitates the building of strong rapport. Other reported facilitators were strong communication with involved stakeholders, appropriate pharmacist training, and proactive leadership. Support from physician colleagues was frequently reported as a driving factor in policy development. Hesitancy on the part of both pharmacists and physicians was among the most frequently listed barriers. Other reported issues included lack of resources in terms of staffing and time required for policy development.

DISCUSSION

Responses to this survey provided valuable insight into the current scope of expanded pharmacist activities across hospitals in Ontario. An overall response rate of 82% (46 hospitals) means the results were highly representative of Group A and Group B hospitals in Ontario. Although the survey did not reach the target sample size of 48, this sample exceeded the response rate in the most recent Hospital Pharmacy in Canada Survey, conducted in 2021, which was 53% for Ontario.[16] Several factors set this study apart and helped to enable the high number of responses. First, the survey targeted individuals in clinical pharmacy leadership positions, many of whom were involved in the development of expanded-practice policies. Second, the follow-up phone

calls helped in fostering interest in the survey and resolving unanticipated issues, such as incorrectly transcribed email addresses or links sent to the wrong person.

Responses to the quantitative questions revealed differences in expanded-scope clinical activities between Group A and Group B hospitals. Group A hospitals tended to have policies for independent pharmacist prescribing and ordering of laboratory tests. In contrast, Group B hospitals tended to have policies for pharmacist-led therapeutic drug monitoring, as well as for medication adaptation and discontinuation. These differences could be due to a variety of factors; for example, teaching hospitals have well-delineated academic mandates that are focused on learner education, which may have resulted in the development of broad prescribing and laboratory ordering policies in Group A hospitals. Conversely, Group B hospitals tend to have fewer specialized clinical services, which may explain their tendency to have general policies such as those related to dose/route adaptation, discontinuation of duplicate home medications, and therapeutic drug monitoring. The variability in types of policies found across hospitals in Ontario reinforces the need for standardization, to ensure that patients admitted to any hospital in Ontario receive similar expanded-scope clinical services. Hospital pharmacy advocacy groups in Ontario should look to Alberta as an example, where expanded-scope policies are implemented provincially, hence ensuring consistent quality of care. Using a similar provincial approach, hospital pharmacy advocacy groups in Ontario could facilitate policy development through resource sharing. In the meantime, these data also serve as a benchmark allowing individual hospitals to assess their current practice in relation to similar institutions and helping them to identify high-value practice changes.

The responses to qualitative questions highlighted several facilitating factors, including an overwhelming expression of perceived support from other health care providers, which have likely contributed to the drive for role optimization through the expansion of pharmacists' scope of activities. Recognizing the importance of developing those interprofessional relationships can help institutions to drive policy change, particularly when the effort is combined with strong communication that highlights the recognized success of pharmacists in areas such as renal dose adjustment and therapeutic drug monitoring. Learning from the successes of various institutions can help in the development of a plan with actionable items for next steps in policy development.

This study had several limitations. As with any survey, there was a risk of response bias. Respondents who completed the questionnaire may have been working in hospitals that had more expanded-scope activities for pharmacists, which might have increased their willingness to participate. We attempted to minimize this risk of response bias by providing consistent and frequent follow-up with every surveyed hospital. Additionally, the online list published by the Ontario Ministry of Health defining Group A and Group B institutions used in this study was last updated in 2012. It is possible that the number of hospitals in each group has changed over the years through an expansion in the number of acute care beds and the development of teaching programs. Although the survey did not gather information about the impact of pharmacists' expanded-scope activities on measurable patient care outcomes, the primary goal was to gather much-needed data on the current state of hospital pharmacy in Ontario. We recognize this limitation in the design; however, without first understanding the current landscape of hospital pharmacy practice in Ontario, data on measurable patient outcomes would be limited to the authors' institution. Lastly, the survey included open-ended questions to ask about facilitators and barriers; this approach resulted in broad responses, limiting the insight and actionability of the data collected.

CONCLUSION

The majority of the survey respondents reported having policies to expand pharmacists' clinical activities. There was a great deal of variability in scope at each institution due to differing policy development and human resources. Our data reinforce the need for advocacy at the provincial level to broaden and unify the scope of hospital pharmacist practice, which will in turn ensure equitable care for all patients and thus improve outcomes. Future studies should look at the specific impact of pharmacists' expanded-scope activities on measurable patient care outcomes in Ontario, such as length of stay and incidence of adverse effects. Such data may assist in identifying vital clinical practices where advocacy for standardization would be appropriate.

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Sarah Tessier, BSc, PharmD, ACPR, RPh, is with The Ottawa Hospital, Ottawa, Ontario.

Victor Tsang, BScPharm, PharmD, ACPR, RPh, is with St Joseph's Health Care London, London, Ontario.

Spencer Martin, BSc, PharmD, ACPR, RPh, is with the London Health Sciences Centre, London, Ontario.

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Address correspondence to:
Dr Sarah Tessier
The Ottawa Hospital
501 Smyth Road
Ottawa ON K1H 8L6

email: satessier@toh.ca

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APPENDIX 1 (part 1 of 3): Survey questions.

Eligibility

I am currently a licensed pharmacist practicing in a hospital in Ontario in a pharmacy clinical leadership position.

Demographic information

1. What is the name of your institution?
2. What is the approximate bed size of your institution?
   - 100 to 200 acute care beds
   - 201 to 500 acute care beds
   - Greater than 500 acute beds
3. What is the approximate number of full-time pharmacists employed by your institution?
4. What is the approximate number of part-time/casual pharmacists employed by your institution?
5. What hospital pharmacy practice model is most used by your institution?
   - Distributive model (pharmacists primarily perform drug distribution)
   - Generalist model (pharmacists have both distributive and clinical responsibilities during their shift)
   - Separate model (pharmacists are either distributive or clinical)
   - Clinical model (pharmacists primarily perform clinical duties)
   - Other (please specify)

Pharmacist adaptation, discontinuation, and renewal of inpatient medication orders

6. My hospital has a policy or medical directive allowing pharmacists to independently adapt, discontinue or renew existing medication orders. Yes or No?

Under the prescription adaptation, discontinuation, or renewal policies/medical directives, pharmacists are allowed to (select all that apply):

- Change the dose, dosage form, route of administration for any medication order
- Perform dose adjustments based on renal function
- Perform dose adjustments based on age and weight
- Renew patient home medications for the management of chronic conditions or continuity of care
- Discontinue a home medication that has been ordered but that the patient no longer takes or that is no longer required
- Discontinue duplicate therapy (e.g., discontinuing a low-molecular weight heparin when an oral anticoagulant is initiated)
- Other (please specify):

Pharmacist prescriptive authority

7. My hospital has a policy or medical directive allowing pharmacists to independently initiate new medication orders. Yes or No?

Under the prescriptive authority policy/medical directive, pharmacists are allowed to:

- Independently write a new medication order for any Schedule I medication under their own name
- Independently write a new medication order for only selected medications or drug classes under their own name

For which of the following medication classes are pharmacists allowed to independently write a medication order under their own name (select all that apply)?

- Antibiotics
- Anticoagulants
- Antidepressants
- Contraceptives
- Other (please specify):

APPENDIX 1 (part 2 of 3): Survey questions.

Pharmacist drug and disease state monitoring

8. My hospital has a policy or medical directive allowing pharmacists to order, receive, and interpret laboratory tests for the purpose of therapeutic drug monitoring. Yes or No?

Under the therapeutic drug monitoring policy/medical directive, pharmacists are allowed to (select all that apply):
- Independently order and interpret laboratory tests related to therapeutic monitoring for vancomycin
- Independently order and interpret laboratory tests related to therapeutic monitoring for aminoglycosides (gentamicin, tobramycin, and amikacin)
- Independently order and interpret laboratory tests related to therapeutic monitoring for warfarin
- Other (please specify):

9. My hospital has a policy, procedure or medical directive allowing pharmacists to order and interpret laboratory tests for the management of chronic or acute medical conditions. Yes or No?

Under the ordering of laboratory tests policy/medical directive, pharmacists are allowed to:
- Independently order and interpret any laboratory test
- Independently order and interpret only a limited number of specific laboratory tests

Which of the following laboratory tests are pharmacists allowed to independently order and interpret (select all that apply)?
- Electrolyte levels
- Serum creatinine levels
- Hemoglobin A1C
- Electrocardiograms for QT prolongation
- Other (please specify):

Ambulatory care

10. What is the approximate number of ambulatory care clinics in your institution?

11. Which of the following ambulatory care clinics at your institution have implemented policies or medical directives to expand pharmacist scope of practice? (select all that apply):
    - Anticoagulation clinic (e.g., warfarin monitoring and dose adjustments)
    - Nephrology/dialysis clinic
    - Oncology clinic
    - Psychiatry clinic (e.g., outpatient service to monitor therapeutic lithium or clozapine levels)
    - Other (please specify below):

Benefits and limitations

Please indicate the degree to which you either disagree or agree with the following statements.

12. Pharmacists' expanded-scope activities allow pharmacists to have a greater impact on patient care:
    Strongly disagree, Disagree, Neutral, Agree, Strongly agree

13. Pharmacists' expanded-scope activities decrease medication turnaround times:
    Strongly disagree, Disagree, Neutral, Agree, Strongly agree

14. Pharmacists' expanded-scope activities prevent potential adverse drug events from occurring:
    Strongly disagree, Disagree, Neutral, Agree, Strongly agree

15. Pharmacists' expanded-scope activities are supported by other health care providers:
    Strongly disagree, Disagree, Neutral, Agree, Strongly agree

16. Pharmacists' expanded-scope activities lead to decreased communication between pharmacists and other health care providers:
    Strongly disagree, Disagree, Neutral, Agree, Strongly agree

APPENDIX 1 (part 3 of 3): Survey questions.

17. Pharmacists' expanded-scope activities decrease key learning opportunities for medical students and residents:
Strongly disagree, Disagree, Neutral, Agree, Strongly agree
18. Pharmacists' expanded-scope activities lead to increased job satisfaction:
Strongly disagree, Disagree, Neutral, Agree, Strongly agree
19. My institution has sufficient resources and time to develop policies or medical directives related to pharmacists' expanded-scope activities:
Strongly disagree, Disagree, Neutral, Agree, Strongly agree
20. What facilitated the implementation of pharmacists' expanded-scope activities in your institution? If your institution has not implemented any expanded-scope activities, please answer based on anticipated facilitators (for example, support from management, guidance from professional pharmacy associations).
21. What were some of the barriers to implementing pharmacists' expanded-scope activities in your institution? If your institution has not implemented any expanded-scope activities, please answer based on anticipated barriers (for example, insufficient time to develop new policies).
22. What strategies do you believe could be used to help overcome barriers to implementing pharmacists' expanded-scope activities?
23. What steps were taken to gain support from other key stakeholders (i.e., physicians, nurses, hospital management) during the implementation of pharmacists' expanded-scope activities?

Implementation

24. Please list the policies or medical directives related to pharmacists' expanded-scope activities that exist in your institution. For example, "Medical Directive – Pharmacist Management of Anticoagulation Therapy".