LISA M. GUIRGUIS

While evidence demonstrates that pharmacists can provide effective asthma management, we wanted to learn more about current pharmacists' care for Albertans with asthma. We also explored the influence of a practice tool, Chat, Check and Chart, as well as pharmacists' familiarity with it, to gauge a local strategy to close potential practice gaps.

Même si les données probantes montrent que les pharmaciens peuvent offrir une prise en charge efficace de l'asthme, nous voulions en apprendre davantage sur les soins qu'ils dispensent actuellement aux Albertains atteints de cette maladie. Nous avons également examiné l'utilité d'un outil axé sur la pratique, Chat, Check and Chart, et la connaissance qu'en avaient les pharmaciens, afin d'évaluer une stratégie locale visant à combler les lacunes potentielles de la pratique.

Assessing the knowledge to practice gap: The asthma practices of community pharmacists

Lisa M. Guirguis, BScPharm, PhD, on behalf of the Asthma Working Group of the Respiratory Health Strategic Clinical Network

ABSTRACT

Background: Community pharmacists are well positioned to identify patients with poorly controlled asthma and trained to optimize asthma therapy. Yet, over 90% of patients with asthma live with uncontrolled disease. We sought to understand the current state of asthma management in practice in Alberta and explore the potential use of the Chat, Check and Chart (CCC) model to enhance pharmacists' care for patients with asthma.

Methods: An 18-question survey was used to examine pharmacists' monitoring of asthma control and prior use of the CCC tools. Descriptive statistics were used to characterize the response rate, sample demographics, asthma management and CCC use. Survey validity and reliability were established.

Results: One hundred randomly selected pharmacists completed the online survey with a 40% (100/250) response rate. A third of responding pharmacists reported talking to most patients about asthma symptoms and medication, with a greater focus on talking with patients on new prescriptions over those with ongoing therapies. Fewer than 1 in 10 pharmacists routinely talked to most patients about asthma action plans (AAPs). The majority of pharmacists (76%) were familiar with the CCC model, and 83% of those reported that the CCC model influenced their practice anywhere from somewhat (45%) to a great deal (38%). Both scales had good reliability, and factor analysis provided support for scale validity.

Conclusions: There was considerable variability in pharmacists' activities in monitoring asthma. Pharmacists rarely used AAPs. The CCC model had a high level of self-reported familiarity, use and influence among pharmacists. *Can Pharm J (Ott)* 2018;151:62-70.

Background

Over 2.5 million Canadian adults have asthma.¹ A 2016 survey reported that 9 in 10 Canadians with asthma do not have it under control, and 3 in 10 miss school, work or other social activities due to asthma.² Poor asthma control increases emergency room visits, hospitalizations and time away from work while decreasing a patient's quality of life.³ Written asthma action plans (WAAPs) provide patients with direction to monitor their asthma symptoms and modify their medication and take specific action to

maintain asthma under control. WAAP, in combination with self-management education, has been shown to reduce hospitalizations, reduce emergency room visits and increase quality of life.⁴ Yet less than 2% of patients in Alberta had documented evidence of a WAAP in physicians' records,⁵ and only 3% of Canadians reported a WAAP when presenting to an emergency department.⁶

Community pharmacists are well positioned to identify patients with poorly controlled asthma and are trained to optimize asthma

therapy. Multiple research projects have established that pharmacist services improve the health of patients with asthma.⁷⁻⁹ Research also suggests that pharmacists can increase the use of WAAPs.^{10,11} Yet research in other jurisdictions suggests that pharmacists rarely assess asthma control outside of research studies, as pharmacy workflow is often focused on dispensing medications.^{12,13} While the uptake of WAAPs by Alberta pharmacists is not known, based on research with other Albertan health care professionals,^{5,6} we anticipated a substantial gap in the use of WAAPs in pharmacy practice.

In Canada, there has been a call to ensure that evidence-based practices, such as the use of WAAPs, are adopted in practice.¹⁴ This is accomplished through implementation science, a relatively new field of practice-based research, where researchers examine strategies to move knowledge into practice.¹⁵ Implementation science recognizes that knowledge is contextual and translation models must meet the needs of local knowledge users. Therefore, our goal is not only to identify gaps in asthma care but to explore the application of a local implementation strategy.

In Alberta, the Chat, Check and Chart (CCC) model was developed as a local implementation strategy to help pharmacists apply the standards for professional practice.¹⁶ The CCC model has been shown to increase pharmacists' positive role beliefs and self-efficacy toward patient care, which are key to making a practice change.¹⁷ The CCC model illustrates the Alberta College of Pharmacists' (ACP's) Standards for Pharmacy Practice with a flexible approach to patient care. The ACP website provides links to 8 unique CCC tools, including tool cards, research reports and vital behaviours for the CCC model.¹⁸ The CCC tools have been adapted for prescribing, vital behaviours for success and opioid monitoring. The CCC tools may also be adapted to asthma and partnered with an implementation strategy to increase pharmacist use of WAAPs. This research represents the first step to understand the current state of asthma management in practice and explore the familiarity and use of CCC tools as a part of a potential implementation strategy.

Research objectives

The overall research objective was to characterize the level of care pharmacists provide for patients

KNOWLEDGE INTO PRACTICE

- Over 9 out of 10 Canadians with asthma do not have it well controlled, and most do not have an asthma action plan. In research studies, pharmacists' care has been shown to improve outcomes for patients with asthma.
- In Alberta, fewer than 1 in 10 pharmacists routinely talked to patients about asthma action plans. About 3 in 10 pharmacists reported talking with most patients about asthma symptoms or medications.
- Three-quarters of pharmacists were familiar with the Chat, Check and Chart model, and of those, 8 in 10 pharmacists reported that it influenced their practice.
- We propose using the Chat, Check and Chart model to enhance pharmacists' care for patients with asthma.

with asthma and use of CCC tools in Alberta. Specific objectives were to characterize the

1. extent to which pharmacists were currently monitoring asthma control, discussing inhaled corticosteroid use with patients or using AAPs (i.e., written or verbal);
2. extent to which pharmacists were familiar with and influenced by the CCC model and tools;
3. extent to which pharmacists were using the CCC model and tools; and
4. psychometric properties of the survey scales (reliability and validity).

Research design

An 18-question survey was used to examine pharmacists' use of CCC tools and monitoring of asthma control (sample questionnaire provided in Appendix 1, available in the online version of the article). The Population Research Lab (PRL), at the University of Alberta, was contracted to conduct the survey. The research was reviewed and approved by the Health Ethics Research Board B at the University of Alberta.

Sample

We sampled community pharmacists from the ACP's clinical registry who had agreed to share their information for research and listed primary work address as a community pharmacy (i.e., not hospitals, clinics or long-term care). Community pharmacists will be referred to as pharmacists throughout the article. Based on a population of 4590 pharmacists registered in Alberta in 2014, we expected a sample of 100

MISE EN PRATIQUE DES CONNAISSANCES

- Parmi les Canadiens atteints d'asthme, plus de neuf sur dix présentent un asthme mal maîtrisé et la plupart n'ont pas de plan d'action pour leur maladie. Des études montrent que les soins dispensés par les pharmaciens améliorent les résultats chez les patients atteints d'asthme.
- En Alberta, moins d'un pharmacien sur dix discute régulièrement avec les patients de plans d'action pour l'asthme. Environ trois pharmaciens sur dix disent discuter des symptômes de l'asthme ou des médicaments pour l'asthme avec la plupart des patients.
- Les trois quarts des pharmaciens connaissent l'outil *Chat, Check and Chart* et, parmi eux, huit sur dix ont indiqué que cet outil avait influencé leur pratique.
- Nous proposons d'utiliser le modèle *Chat, Check and Chart* pour améliorer les soins dispensés par les pharmaciens aux patients atteints d'asthme.

pharmacists would provide a 10% margin of error with a 95% confidence level. To obtain a sample of 100 pharmacists, we randomly sampled 250 pharmacists.

The presurvey letters were sent by post to 250 pharmacists in Alberta on February 12, 2016, a week before an email invitation was sent. The presurvey letters contained information about the study, a link with a unique password to start the 5-minute survey immediately and a randomly assigned \$2 or \$5 Tim Horton's gift receipt as an appreciation for their time and consideration of participating in the study. This randomization allowed the researcher to evaluate the impact of the size of the survey incentives.

Survey

The survey was designed to capture a snapshot of pharmacist awareness of, and use of, CCC tools and care for patients with asthma. It included 5 questions about pharmacist familiarity with CCC tools, 6 about pharmacists' care for patients with asthma and 7 demographic questions (Appendix 1). These questions have been adapted from prior research on pharmacist prescribing behaviours.¹⁹ This brief survey was not designed to examine barriers or facilitators to practice, which have been documented through previous studies, but instead to gather information on the uptake and current usage of the CCC model and asthma care in community pharmacy practice. The survey was reviewed by 2 community pharmacists.

Analysis

Descriptive statistics were used to characterize the response rate, sample demographics, asthma management and CCC use. Asthma care and CCC intensity scores were calculated by taking the mean of 4 questions for asthma management and 3 questions for the CCC model. An exploratory factor analysis was used to establish evidence for the validity of the survey tool. The factor analysis was performed on the correlation matrix with a direct oblimin rotation (i.e., factors were theorized to be related). Cronbach's alpha was calculated and scores greater than 0.70 were considered to have good scale reliability. To establish criterion validity, pharmacists' asthma care intensity and CCC intensity scores were compared between pharmacists who did and did not have additional prescribing authorization and asthma training, as well as across duration of licensure. Appropriate chi-square, *t* test or analysis of variance was used, with $p < 0.05$ considered significant.

Results

One hundred pharmacists completed the online survey. The response rate was 40% (100/250). Ten pharmacists completed the survey before the electronic invitation went out using a link and their password provided in the mailed presurvey letter. Four email reminders were sent to those who had not completed or started a survey. They had a positive effect on the level of participation by pharmacists (spikes in completed surveys on all but 1 reminder day). There was no difference in response rate between the pharmacists who received a \$5.00 card (41.6%) or \$2.00 card (38.5%) (chi-square, $p = 0.61$). The pharmacist demographics (Table 1) appeared similar to data from a 2013 survey (e.g., training, gender and current position).¹⁹

Pharmacy staff was more likely to ask most/all patients with asthma if they had any questions or concerns about a new prescription (74.3%) in comparison to a refill (40.3%) (Figure 1). Approximately a third of pharmacists reported that pharmacy staff ask patients with refills few or no questions (Figure 1). Nearly a third of pharmacists (28%) stated that they asked most/all patients about their asthma symptoms, while 19% asked few to no patients (Figure 2). Over a third of pharmacists asked most/all patients about their use of short-acting bronchodilators or inhaled corticosteroids, while less than 20%

TABLE 1 Pharmacist demographics

Characteristic	% (N = 100)
Sex (n = 100)	
Male	39
Pharmacist training (n = 100)	
Certified asthma/respiratory educator	1
Asthma-specific training	14
PharmD/residency	4
Additional prescribing authorization (n = 100)	19
Initial practice degree in Alberta (n = 100)	57
Year of Canadian license (n = 98), n (%)	
≤1979	10 (10.2)
1980-89	11 (10.2)
1990-99	8 (8.2)
2000-9	32 (32.7)
2010-16	37 (37.8)
Current position (n = 100)	
Management	34
Staff	61
Other (consultant, relief)	5
Pharmacist perception of “busyness” (n = 76*), n (%)	
Slow	0
Slow with busy times	8 (10.5)
Busy with slow times	20 (26.3)
Busy	22 (28.9)
Very busy	22 (28.9)
Frantic	4 (5.3)
Percentage of time in medication preparation** (n = 100)	
0%-20%	6
21%-40%	15
41%-60%	17
61%-80%	39
81%-100%	23

*Question V6 on “busyness” was offered only if a pharmacist was familiar with the Chat, Check and Chart model.

**Medication preparation activities include dispensing medication, processing or explaining third-party claims and checking for accuracy, compounding.

asked few to no patients. Pharmacists were far less likely to talk about an AAP (i.e., written or verbal), with only 7% of pharmacists doing this for most/all patients, while 57% of pharmacists reported doing this for few to no patients.

The majority of pharmacists (76%) were familiar with the CCC model (Figure 3), with only 3% of pharmacists not having heard of it. When pharmacists familiar with the model were asked how it influenced their day-to-day

FIGURE 1 Pharmacist staff interactions with patients with asthma

In the past month, what proportion of patients with **asthma** did pharmacy staff ask if they had any questions or concerns:

FIGURE 2 Pharmacist self-reported care activities for patients with asthma

In the past month, what proportion of patients with asthma did you talk to about:

pharmacy practice, 17% responded not much, 45% responded somewhat and 38% responded a great deal. No pharmacists indicated that CCC did not influence their practice at all. All pharmacists who were familiar with the CCC model used it to some degree in daily practice. Pharmacists were much more likely to report using “Chat” (76%) and “Check” (72%) a great deal in their daily practice over “Chart” (33.3%) (Figure 4).

The asthma care intensity score was 3.93 (SD = 1.36, $n = 99$) on a scale from 1 to 7, with 1 being “no patients receive care activities” and 7 being “all patients receive care activities” (Figure 2). The CCC model intensity score was 3.48 (SD = 0.51, $n = 75$) on a scale from 1 to 4, with 1 being “not at all” and 4 being “a great deal” (Figure 4). An exploratory factor analysis found that the 7 questions formed 2 separate factors (Table 2). Both had good reliability (Cronbach’s alpha >0.70) (Table 2). There was a significant

difference ($p < 0.01$) in the asthma intensity scores for pharmacists with asthma training ($M = 4.95$, SD = 1.30) and without training ($M = 3.75$, SD = 1.30), providing evidence for validity. There was a significant difference ($p = 0.03$) in the CCC model intensity scores for pharmacists with additional prescribing authorization (APA) ($M = 3.73$, SD = 0.39) and without APA ($M = 3.41$, SD = 0.52). As anticipated, there were no significant differences in asthma intensity scores for pharmacists based on APA ($p = 0.58$) and year of licensure ($p = 0.48$) or the CCC model intensity scores for pharmacists based on asthma training ($p = 0.06$) and year of licensure ($p = 0.78$).

Discussion

Overall, pharmacists in Alberta reported a wide range of asthma care practices. Pharmacists were more likely to focus on patients with new prescriptions over monitoring therapy for those

FIGURE 3 Pharmacists' familiarity with the Chat, Check and Chart model

Which of the following best describes your familiarity with the CCC Model?

FIGURE 4 Pharmacists' use of the Chat, Check and Chart model in daily practice

In your day-to-day practice, to what extent have you used the following parts of the Chat Check and Chart model?

with a refill. Pharmacists' bias for providing more counselling on new versus refill prescriptions has been well documented in research.^{20,21} Similarly, pharmacists report that it is easier to engage new inhaler users in an inhaler technique assessment than experienced users.²² If pharmacists believe their role is to provide patients with medication information, they will focus on a new prescription when patients may be most receptive to medication information.²³ Asking patients with asthma about refills may challenge pharmacists' and patients' sense of competency, creating discomfort that pharmacists seek to avoid, particularly in a busy pharmacy practice.²⁴ Pharmacists are faced with balancing the desire for harmonious patient relationships with the reality that 90% of Canadians with asthma have poor symptom control.⁸

About 2 in 10 pharmacists reported talking with few patients about asthma symptoms and medications, while about 3 in 10 pharmacists reported talking to most patients. No appreciable difference was identified in the rate of talking about asthma symptoms or medications. In contrast, over 90% of pharmacists in Australia were more likely to identify their role in asthma as discussing medication use (90%), over asking about symptoms and asthma control (60%).²⁵

Fewer than 1 in 10 pharmacists routinely talked to most patients about AAPs (i.e., either written or verbal). Pharmacists were not specifically asked about creating written asthma action plans, as these would be expected to be infrequent and similar to prior work with family physicians.^{5,6} Research suggests that both health care professionals and patients may perceive

TABLE 2 Summary of survey properties: Exploratory factor analysis, variation explained and Cronbach's alpha

	Factor loadings		Percent variance explained	Cronbach's alpha
	1	2		
In the past month, what proportion of patients with ASTHMA did you talk to about their asthma control/symptoms?	0.85	0.43	44.59	0.89
In the past month, what proportion of patients with ASTHMA did you talk to about their use of short acting beta2 agonists?	0.91	0.41		
In the past month, what proportion of patients with ASTHMA did you talk to about their use of inhaled corticosteroids?	0.86	0.27		
In the past month, what proportion of patients with ASTHMA did you talk to about an asthma action plan?	0.62	0.22		
In your day-to-day practice, to what extent have you used the following parts of the Chat, Check and Chart model: Chat?	0.28	0.85	17.64	0.72
In your day-to-day practice, to what extent have you used the following parts of the Chat, Check and Chart model: Check?	0.31	0.75		
In your day-to-day practice, to what extent have you used the following parts of the Chat, Check and Chart model: Chart?	0.49	0.55		

Rotation method: Oblimin. **Bold items** indicate which questions load on each factor.

low value in WAAPs and thus plans are not kept up-to-date, further enforcing their current low relevance.^{26,27} In Alberta, the provincial health services plan reimburses pharmacists for creating care plans for patients with 2 or more chronic diseases/risk factors (\$100-\$125) or 1 chronic disease and 3 or more prescription medications (\$60-\$75), with subsequent funding for follow-ups (\$25).²⁸ WAAPs should be part of the patient care plan service, allowing pharmacists to be reimbursed for their time. Future research may consider exploring the rate of WAAP usage in pharmacists' care plans. Primary health care practitioners, including pharmacists, provide opportunities to dramatically shift the demand for acute services by offering better care in the community. There is a gap between our knowledge of best practices in asthma and routine care by community pharmacists, suggesting the need for a strategy to improve knowledge translation.

Researchers and decision makers have long faced challenges in enhancing health care, including pharmacy practice. Our results indicate that the CCC model had a high level of familiarity and self-reported influence. This may be due to the integration of CCC tools into existing ACP practices through workshops, education programs, practice tools, newsletters and coaching with the practice consultants. It is not

clear how the CCC model influenced pharmacists' care, nor does this research evaluate the effectiveness of the CCC model. However, the CCC model could be considered a facilitator of change in practice, particularly when partnered with strategies addressing practice barriers.²⁹

Little work has been conducted evaluating broad-based knowledge translation strategies in pharmacy. Truong et al.³⁰ confirmed that passive mailing does not facilitate the translation of evidence-based changes in major pharmacy practice by Canadian pharmacy organizations. A recent literature review in the allied health field found 15 studies that used a combination of education materials and meetings, as well as financial strategies to improve knowledge translation.³¹ Studies were described as having low methodological quality, and only 2 found a clear benefit.^{32,33} A second literature review by Patwardhan et al.³⁴ identified 21 studies with interventions to influence pharmacists' provision of cognitive services. Over two-thirds of researchers used multiple interventions, including didactic lectures, written pharmacist materials, patient education materials and follow-up contacts. Interventions were often compared to a group with no intervention; thus, comparisons between interventions were not possible. There is a need for a robust study that evaluates how

implementation strategies affect pharmacists' care and subsequent patient outcomes.

Strengths and Limitations

This project adapted known survey tools and used a robust recruitment strategy to recruit a representative sample of pharmacists. A random sample of 100 pharmacists was recruited, which would allow for a 10% margin of error 95 times out of 100, a margin of error acceptable for this exploratory survey. The question on busyness was inadvertently only offered if a pharmacist was familiar with the CCC model; thus, data on busyness were missing for 24 pharmacists not familiar with the CCC model.

Pharmacists may have overreported socially desirable activities such as level of patient care and use of the CCC model. The first 2 questions on the survey were designed to reduce this social desirability by allowing pharmacists to report on frequently occurring activities (i.e., asking patients if they had questions at the time of new or refill prescriptions). Social desirability would

result in an underreporting of practice gaps, yet substantial gaps were found. There was strong evidence for scale validity and reliability. As theorized, pharmacists with asthma education and additional prescribing rights had increased self-reported levels of patient care.

Conclusions

While a third of pharmacists reported talking with patients about asthma medication and control, 20% reported speaking to few or no patients. Pharmacists rarely used AAPs (verbal or written). The CCC model had a high level of self-reported familiarity, use and influence among pharmacists, suggesting that the CCC model is a feasible tool to help pharmacists envision best practices in asthma management. We believe that by working in partnership with asthma and pharmacy organizations, pharmacists can improve the health of Albertans with asthma. Pharmacists are an integral part of the primary health care team that is working together to improve the health of Albertans with asthma. ■

From the Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta, Edmonton, Alberta. Contact lisa.guirguis@ualberta.ca.

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