

# Health Care Professionals' Perceptions of the Role of the Clinical Pharmacist and Expanded Pharmacist Coverage in Critical Care

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## ABSTRACT

**Background:** During the first wave of the COVID-19 pandemic, coverage by critical care pharmacists (CCPs) was expanded in 2 medical–surgical intensive care units at the Queen Elizabeth II Health Sciences Centre, in Halifax, Nova Scotia, from 8 hours per day, 5 days per week, excluding holidays, to 8 hours per day, 7 days per week, including holidays.

**Objectives:** To describe health care professionals' opinions about and perceived impacts of the expanded CCP coverage on patient care, as well as their opinions about the role of the CCP as a member of the critical care team.

**Methods:** An electronic 22-item survey was distributed to critical care health care professionals to capture opinions and perceived impacts of expanded CCP coverage. The perceived importance of 25 evidence-informed CCP activities was assessed using a 5-point Likert scale.

**Results:** Thirty-eight complete responses were included (15% response rate, based on distribution of the survey to 249 health care professionals). Most respondents agreed or strongly agreed with the following statements: CCPs are integral members of the critical care team (34/38 [89%]), CCPs play an important role in improving patient outcomes (34/38 [89%]), the presence of CCPs on the unit and on patient care rounds allows other health care professionals to concentrate on their own professional responsibilities (33/38 [87%]), and the expanded CCP coverage improved patient care (29/35 [83%]). Respondents most frequently categorized 23 of the 25 CCP activities as very important.

**Conclusions:** Expanded CCP coverage was perceived to have a positive effect on both patient care and members of the critical care team. Most CCP activities were perceived as very important. Given the findings of this quality project, novel staffing models are being explored to optimize CCP coverage.

**Keywords:** critical care, expanded pharmacist coverage, pharmacy practice

## RÉSUMÉ

**Contexte :** Au cours de la première vague de la pandémie de COVID-19, la couverture par les pharmaciens de soins intensifs (PSI) a été étendue dans 2 unités de soins intensifs médico-chirurgicaux du Queen Elizabeth II Health Sciences Centre, à Halifax (Nouvelle-Écosse) : de 8 heures par jour, 5 jours par semaine, hors jours fériés, la couverture est passée à 8 heures par jour, 7 jours par semaine, y compris les jours fériés.

**Objectifs :** Décrire les opinions des professionnels de la santé sur la couverture élargie des PSI et leurs perceptions des incidences de celle-ci sur les soins aux patients, ainsi que le rôle des PSI en tant que membres de l'équipe de soins intensifs.

**Méthodes :** Un sondage électronique comportant 22 questions a été distribué aux professionnels de la santé en soins intensifs pour recueillir les opinions et les impacts perçus de l'élargissement de la couverture des PSI. L'importance perçue des 25 activités des PSI fondées sur des données probantes a été évaluée à l'aide d'une échelle de Likert à 5 points.

**Résultats :** Trente-huit réponses complètes ont été incluses (taux de réponse de 15 %, basé sur une distribution de l'enquête à 249 professionnels de la santé). La plupart des répondants étaient d'accord ou fortement d'accord avec les affirmations suivantes : « les PSI font partie intégrante de l'équipe de soins intensifs » (34/38, 89 %) ; « les PSI jouent un rôle important dans l'amélioration des résultats pour les patients » (34/38, 89 %) ; « la présence des PSI dans l'unité et lors des tournées de soins aux patients permet à d'autres professionnels de la santé de se concentrer sur leurs propres responsabilités professionnelles » (33/38, 87 %) ; et « la couverture élargie des PSI a amélioré les soins aux patients » (29/35, 83 %). Les répondants ont le plus souvent classé 23 des 25 activités du PSI comme « très importantes ».

**Conclusions :** L'élargissement de la couverture des PSI était perçu comme ayant un effet positif à la fois sur les soins aux patients et sur les membres de l'équipe de soins intensifs. La plupart des activités des PSI étaient perçues comme très importantes. Compte tenu des résultats de ce projet de qualité, de nouveaux modèles de dotation en personnel sont à l'étude pour optimiser la couverture des PSI.

**Mots-clés :** soins intensifs, couverture élargie des pharmaciens, pratique pharmaceutique

## INTRODUCTION

At the Queen Elizabeth II Health Sciences Centre (QEII HSC) in Halifax, Nova Scotia, critical care pharmacists (CCPs) provide clinical services to 2 medical–surgical intensive care units (ICUs) 8 hours per day, 5 days per week. The CCPs are integrated members of the critical care team who have specialized training and experience in critical care. They provide pharmaceutical patient care, attend patient care rounds, and provide drug information, education, and support to patients, families, and other health care professionals. On weekends there is no dedicated CCP coverage; instead, pharmacists in the hospital dispensary, who may or may not have critical care training or experience, provide medication distribution services and are available for consultation.

In preparation for a potential increase in the number of patients admitted to the ICUs during the first wave of the COVID-19 pandemic, CCP coverage was expanded to 8 hours per day, 7 days per week, for the period from April 16 to May 31, 2020. This expansion was achieved by having 2 CCPs dedicated to providing clinical coverage to each ICU. The CCPs were not responsible for distribution services during this period.

This project aimed to describe health care professionals' opinions about and the perceived impacts of the expanded CCP coverage on patient care, as well as their opinions about the role of the CCP in critical care.

## METHODS

### Development of Survey Questionnaire

A 22-question electronic survey, based on previous research<sup>1</sup> and the expertise of team members, was created and built using SelectSurvey (Alberta Health Services). Questions were designed to capture opinions about and the perceived impact of expanded CCP coverage, as well as the perceived importance of various activities within the CCP role. Questions pertaining to the role of the CCP were based on the Society of Critical Care Medicine (SCCM) joint task force position paper on critical care pharmacy services,<sup>2</sup> which delineates the activities of a CCP and the scope of pharmacy services within the critical care unit. The project team created 25 statements based on activities outlined in the position paper to include in the survey. Priority was given to activities relating to the individual role of the CCP (i.e., not system-based) and patient care. Activities were excluded if they were not feasible to offer because of limits on resources available at the time (e.g., bar coding) or would not be changed by the results of the survey (e.g., CCP would continue to use the medical record to communicate with other health care professionals, regardless of the perceived importance of this activity). In addition, several related activities were combined into single statements to minimize the length of the survey. The survey was assessed for

face validity and readability by 5 non–critical care health care professionals. The complete survey is available upon request to the corresponding author.

### Distribution of Survey Questionnaire

A link to the survey was distributed by email to all health care professionals working in the study ICUs; the distribution included medical residents who completed rotations during the study period. The online survey was open from August 28 to September 25, 2020. Completion of the survey was considered to represent implied consent.

## RESULTS

The survey was distributed to 249 health care professionals. Thirty-eight complete responses were received, for an overall response rate of 15%. Incomplete responses were not included in the analysis. Respondents' characteristics are shown in Table 1.

### Perceived Impact of Expanded Clinical Pharmacist Coverage

Thirty-five (92%) of the 38 respondents reported working with a CCP during the study period. These respondents

TABLE 1. Characteristics of Respondents

Characteristic	No. (%) of Respondents (n = 38)
Health care professional	
Physician	9 (24)
Medical fellow	2 (5)
Medical resident	5 (13)
Nurse	20 (53)
Other <sup>a</sup>	2 (5)
Primary ICU site	
MSNICU	14 (37)
MSICU	7 (18)
Both MSNICU and MSICU	17 (45)
Length of time working in critical care at the QEII HSC (years)	
0–2	10 (26)
3–5	10 (26)
6–10	5 (13)
> 10	13 (34)
Proportion of time spent working clinically in critical care	
≤ 25%	8 (21)
26% to 50%	1 (3)
51% to 75%	2 (5)
> 75%	27 (71)

ICU = intensive care unit, MSNICU = medical–surgical intensive care unit, MSNICU = medical–surgical neuroscience intensive care unit, QEII HSC = Queen Elizabeth II Health Sciences Centre (Halifax).

<sup>a</sup>“Other” consisted of 1 pharmacist and 1 respiratory therapist.

most frequently reported consulting a CCP multiple times per day (15 [43%]). Most respondents reported that expanded CCP coverage was helpful to their practice (20 [57%] strongly agreed and 9 [26%] agreed) and improved patient care (18 [51%] strongly agreed and 11 [31%] agreed). Of the 3 respondents who had not worked with a CCP during the study period, 1 felt that expanded CCP coverage would be helpful to their practice, and 2 were neutral. When these respondents were asked whether expanded CCP coverage would improve patient care, 1 respondent strongly agreed and 2 respondents were neutral.

Most respondents agreed or strongly agreed with the following statements: CCPs are integral members of the critical care team (34 [89%]), CCPs play an important role in improving patient outcomes (34 [89%]), and the presence of CCPs on the unit and on patient care rounds allows other health care professionals to concentrate on their own responsibilities (33 [87%]).

In free-text responses, respondents commented that CCP coverage 7 days per week facilitated timely dose adjustments for renal function, identification and resolution of drug interactions, re-initiation of home medications, optimization of opioid and sedative regimens, the establishment of appropriate stop dates for antimicrobials, and transition to enteral medications when appropriate. The expanded coverage was also noted to ensure continuity of care, given frequent transitions of physician teams.

### Availability of CCPs

When respondents were asked how many days per week CCPs should be present in the ICU, 30 (79%) indicated 7 days per week. When asked how many hours per day CCPs should be present in the ICU, the most frequent response was 8 hours (15 [39%]).

### Role of CCPs

Respondents were asked to rank the importance of CCPs performing 25 patient care, interprofessional, administrative, and research activities, using a 5-point Likert scale from 1 (not important) to 5 (very important). Respondents most frequently categorized 23 of the 25 CCP activities as very important (Figure 1).

## DISCUSSION

### Expanded Coverage by CCPs

Overall, the results demonstrated that members of the critical care team see the value of CCPs and perceived that their presence in the ICU 7 days per week provided additional value.

The benefits of including CCPs in critical care teams are supported by the literature. A systematic review and meta-analysis<sup>3</sup> showed that having a CCP as part of the critical care team was associated with a significant

reduction in mortality (odds ratio [OR] 0.78, 95% confidence interval [CI] 0.73 to 0.83) and length of stay in the ICU (mean difference -1.33 days, 95% CI -1.75 to -0.90 days) for mixed medical-surgical ICUs. In addition, there were significant reductions in the prevalence of preventable and nonpreventable adverse drug events (OR 0.26, 95% CI 0.15 to 0.44, and OR 0.47, 95% CI 0.28 to 0.77, respectively).

Research has also shown that CCPs can reduce health care expenditures through cost avoidance, mostly through the prevention of adverse drug events.<sup>4-6</sup> Additionally, CCPs have been found to have a return-on-investment ratio of approximately 25:1, and it has been suggested that this is likely an underestimate because the cost savings associated with reductions in mortality and ICU length of stay were not included.<sup>4,7</sup>

The American College of Critical Care Medicine recommends that an intensivist-led multidisciplinary team is the ideal model of care in the ICU and states that “critical care pharmacy and pharmacist services are essential”.<sup>8</sup> As medication experts, CCPs are the ideal team members to be proactively involved in guiding and monitoring drug therapy.<sup>7,9</sup>

### Role of the CCP

The SCCM joint task force has categorized CCP activities by the level of institutional critical care services offered.<sup>2</sup> Foundational activities are deemed essential to critical care practice and are the core of critical care pharmacy services. Desirable activities are those that are thought to be “value added” and that expand pharmacists’ scope of practice. The QEII HSC ICUs met the SCCM joint task force definition of level I ICU and therefore had the highest level of expectation for CCP activities.

When asked how important it was for CCPs to participate in the 22 foundational activities included, respondents most frequently indicated that all but 2 were very important. In terms of these exceptions, respondents most frequently responded that CCPs performing independent patient assessments was slightly important and that CCPs attending and participating in resuscitation events was not important or slightly important. Both of these activities are considered to be foundational activities for CCPs practising in a level I ICU.<sup>2</sup> This mismatch between the opinions of local health care professionals and the SCCM joint task force recommendations may be because these are not activities in which the CCPs at the QEII HSC have historically participated.

When asked to rate the importance of CCPs independently prescribing medications within their scope of practice, responses trended toward this activity being important or very important; however, the responses were diverse. New legislation in Nova Scotia has granted pharmacists the authority to independently prescribe for approved minor and common ailments, preventive medicines, a diagnosis



**FIGURE 1.** Perceived importance of critical care clinical pharmacist activities. \*Educate on drug-related procedures, guidelines, and pathways. \*\*Develop processes to reduce/prevent drug errors and adverse drug events. \*\*\*Develop or implement drug therapy protocols and pathways. BPMH = best possible medication history, ICU = intensive care unit.

provided by a primary care provider or specialist, and a diagnosis supported by a protocol.<sup>10</sup> Recent policy changes within Nova Scotia Health have expanded hospital pharmacists' prescribing authority to be consistent with the new legislation and standards of practice. This variation in perception of the importance of CCPs participating in independent prescribing may signify that more education is required on the role of pharmacists' prescribing.

### Limitations

One limitation of this survey was the overall response rate of 15%. A low response rate may limit the generalizability of the results. However, 9 of 14 critical care staff physicians and 2 of 5 critical care fellows completed the survey,

for response rates of 64% and 40%, respectively, for these groups. Therefore, we feel the results are generalizable to the local group of critical care physicians as a whole.

### CONCLUSION

Expanded CCP coverage was perceived to have a positive impact on both patient care and members of the critical care team. Overall, respondents most frequently thought that the foundational activities of the CCP were very important. Given the findings of this quality project, novel staffing models are being explored to optimize CCP coverage. Education is needed with regard to CCPs participating in more expanded roles, such as performing independent

patient assessments, attending and participating in resuscitation events, and prescribing.

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**Competing interests:** For activities outside the immediate scope of the study reported here, Kristin Kaupp has received speaker fees from Dalhousie University and travel funds from Nova Scotia Health, and serves as chair of the Education Committee, Nova Scotia branch of the Canadian Society of Hospital Pharmacists; and Lauren Hutton has received grants from Pfizer for unrelated research and speaker fees from the Canadian Urology Association and the Dalhousie Continuing Pharmacy Education and Regional Oncology Symposium. No other competing interests were declared.

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