



# Adaptations made to delivery of comprehensive medication management in the community pharmacy setting during COVID-19



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## ABSTRACT

**Background:** As a result of COVID-19, numerous adaptations were made to health care delivery, including comprehensive medication management (CMM) delivered in community pharmacies.

**Objective:** Identify and describe the adaptations that have been made to the delivery of CMM among community pharmacies due to COVID-19.

**Methods:** Community pharmacies participating in a CMM implementation and research initiative had regular coaching calls throughout COVID-19 and completed a survey of changes that occurred as a result of COVID-19. Coaching notes and survey results were summarized and mapped to the Framework for Reporting Adaptations and Modifications-Enhanced (FRAME) to systematically capture changes that occurred.

**Results:** A number of reactive adaptations were made to CMM delivery as a result of COVID-19, including increased virtual or remote delivery of CMM, delaying CMM visits to allow pharmacies to provide care directly related to the pandemic including COVID-19 testing and vaccines, wearing personal protective equipment (PPE) in visits, new ways of obtaining clinical patient information, and shifting CMM staffing models.

**Conclusion:** Adaptations that occurred to CMM during COVID-19 allowed pharmacists to continue to serve their patients and meet public health needs.

## 1. Introduction

Comprehensive medication management (CMM) has demonstrated substantial benefit in improving patient outcomes and mitigating avoidable public health costs that stem from suboptimal medication use.<sup>1–4</sup> Despite this evidence of effectiveness, incomplete adoption and implementation has limited its ability to benefit vulnerable patients. Implementation of CMM in community pharmacies presents both unique opportunities to reach patients and challenges.<sup>5</sup> Community pharmacies provide existing relationships, easy access points to care, and unique perspective on medication use behaviors and patient preferences. However, barriers to patient access to care include creating time for CMM, partnering with the care team, and connecting health information.

Research within the field of implementation science has demonstrated that evidence-based interventions, such as CMM, are often modified to address differences between the context in which they were developed and studied, and the context into which they are ultimately implemented.<sup>6</sup> Adaptations are critical to successfully implementing evidence-based practices in a specific context.<sup>7</sup> Adaptations can be planned to improve fit in a particular setting or context, or reactive in response to challenges that arise.

Recent literature has pointed to the opportunities and strategies for adaptations in implementing CMM in community pharmacy.<sup>8</sup>

The coronavirus disease (COVID-19) pandemic led to rapid and significant changes in health care delivery. During the pandemic, adaptations to overcome challenges within the community pharmacy setting provide a unique perspective on prevention, preparedness, response, and recovery during the pandemic.<sup>9</sup> Although much has been written about adaptations to medication dispensing activities in community pharmacies, there is less documentation of adaptations to the delivery of CMM in this setting. Understanding adaptations implemented in the pandemic may offer lessons for sustained innovations in implementing CMM in community pharmacies beyond the duration of the pandemic to improve patient care. The objective of this study was to identify and describe the adaptations made to the delivery of CMM to patients as a result of the COVID-19 pandemic among a group of community pharmacies.

## 2. Methods

This study took place from March to December of 2020 and was part of a larger study to measure the adoption, implementation, and impact of

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CMM in a value-based care model in community pharmacies. Value-based care models focus on the quality of care provided, rather than the volume of patient services. HealthPartners, an integrated health care organization in Minnesota, launched an innovative program supporting CMM services through their pharmacy Partners in Excellence (PIE) program in 2015. The parent study, an 18-month implementation and research initiative named Slice of PIE, was initiated in November 2019. Slice of PIE was developed to build community pharmacist engagement in the PIE program through education and collaboration in an overall effort to improve patient care and help pharmacists achieve clinical performance and patient engagement goals. All pharmacies within the HealthPartners CMM network were invited to participate in Slice of PIE. Of all community pharmacy organizations that were participating in PIE at the beginning of the study period, all but one organization participated in Slice of PIE. A total of 12 organizations and 45 pharmacists within those organizations chose to participate. Six organizations were chain pharmacies (chain defined as having three or more pharmacy locations) and six were independent pharmacies. Slice of PIE provided participating pharmacies an implementation structure and educational support, such as regular webinars to connect with other organizations, coaching calls with an implementation coach, and data and feedback to guide their CMM development and implementation.

### 2.1. Data collection

Adaptations were collected through field notes documented by implementation coaches during their regular coaching calls, which occurred approximately every one to two months. Coaches worked with sites during the time of the collaborative by providing additional support surrounding implementing the Slice of PIE program into their site, including troubleshooting issues, coordinating collaboration between sites, and assisting with clarifying outstanding questions. The implementation coaches worked closely together, as they worked for the same organization and used a consistent coaching model when interacting with sites during coaching calls. To gather information from sites regarding adaptations, these questions were integrated into their regular coaching calls.

A survey was administered to the lead pharmacist at all participating Slice of PIE pharmacies via Qualtrics to gather changes to CMM as a result of COVID-19, which addressed staffing and delivery of CMM, other medication management services provided at the site, and strategies used to collect clinical data for CMM delivery. This survey included 23 items that varied from yes or no questions to free response/select all that apply questions to allow sites to describe their adaptations. Sites were asked to reflect and respond on the adaptations pre- and post-COVID-19 in a single survey.

### 2.2. Design

In 2013, Stirman and colleagues created a system for classifying the types of adaptations that are made when interventions or services are implemented.<sup>6</sup> In 2019, this framework was expanded upon to create the Framework for Reporting Adaptations and Modifications-Enhanced (FRAME).<sup>7</sup> The FRAME not only characterizes adaptations and modifications, but captures the complex factors that contribute to them as well. According to the FRAME, the following eight aspects should be reported, (1) when in the implementation process the modification was made, (2) whether the modification was planned/proactive or unplanned/reactive, (3) who determined that the modification should be made, (4) what is modified, (5) at what level of care delivery the modification is made, (6) type or nature of context or content-level modifications, (7) the extent to which the modification is fidelity-consistent, and (8) the reasons for the modification.<sup>7</sup> The survey previously described was not structured by the frame, so survey data and field notes were mapped to FRAME by two researchers (CMB and DLP) and discussed with the rest of the research team to systematically capture changes to CMM delivery that occurred as a result of COVID-19.

The University of Minnesota Institutional Review Board determined that this project did not require review.

## 3. Results

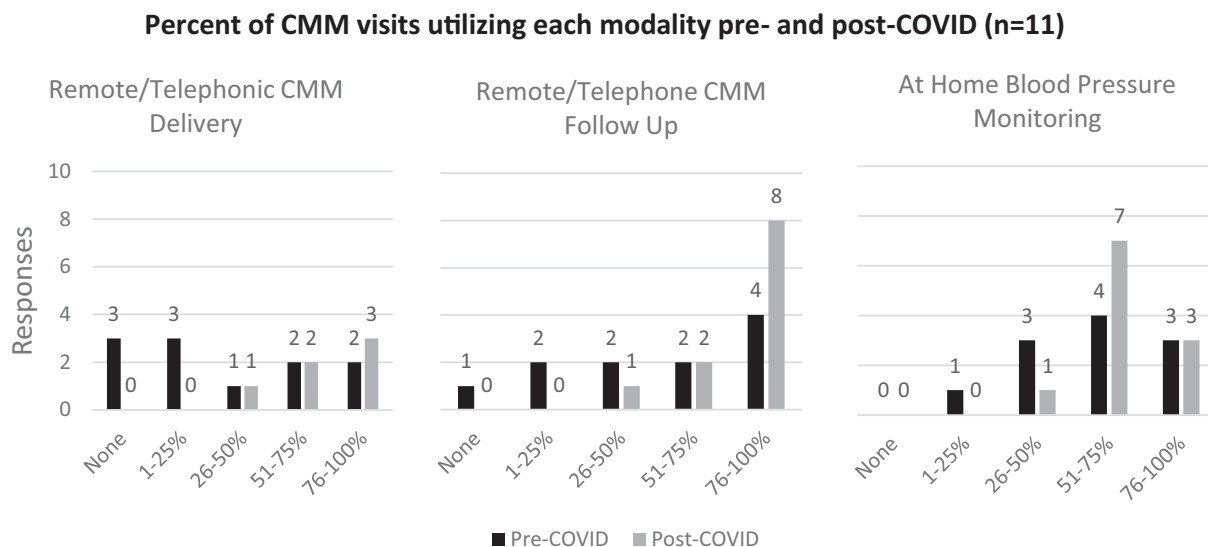
A total of 11 organizations responded to the survey and field notes were reviewed for all 12 organizations. Table 1 illustrates the characteristics of the pharmacies participating in Slice of PIE, including the staffing model, strategies for collecting clinical data, and extent of other medication management services provided by the organization. Most of the pharmacies participating were independently owned; however, the study did include three large chain grocery establishments that operated multiple sites. Nearly all of the responding organizations also provided services through Medicare Part D MTM vendors, including DocStation, Outcomes, Medwise, and Tabula Rasa. Fig. 1 displays changes that occurred before and after the emergence of COVID-19, including proportion of initial and follow-up visits delivered remotely, and proportion of CMM patients monitoring blood pressure at home. Each aspect of the FRAME is outlined in Table 2 describing the adaptations made to CMM among community pharmacies during COVID-19.

The first three components of the FRAME address when adaptations were made, whether the adaptations were planned, and the person responsible for determining which modifications were made. Adaptations that were made by pharmacies were reactive to the COVID-19 pandemic and organizations were at various phases in their implementation of CMM when these adaptations occurred. Some organizations had been providing CMM for several years, whereas others were earlier in implementation. As a result, modifications occurred during the implementation, scale up, and maintenance phases of implementation, depending on the organization. Adaptations were also determined at many different levels. For example, adaptations were made at the sociopolitical level when the Minnesota Department of Human Services eased restrictions on reimbursement for telemedicine for a number of providers, including pharmacists providing CMM, which was supported by the Minnesota Board of Pharmacy.<sup>10</sup> Adaptations were also determined by pharmacy managers, pharmacists, as well as patients.

**Table 1**  
Characteristics of Slice of PIE pharmacies.

Characteristic (N = 11)	Frequency, n (%)
Average pharmacist FTE dedicated to the delivery of CMM through the PIE program (mean ± SD)	1.18 ± 1.52
Engagement in the delivery of CMM for the PIE Program:	
Pharmacy students	6 (55)
Pharmacy residents	2 (18)
Pharmacy technicians	2 (18)
Other medication management services being provided in addition to the PIE Program <sup>a</sup>	
Medicare Part D Vendors	10 (91)
eMTM Initiatives	5 (45)
MN Medicaid	4 (36)
Other	1 (9)
Objective clinical patient data for remote CMM is collected by <sup>a</sup>	
Accessing the patient's electronic medical record	3 (27)
Contacting the provider's office	10 (91)
Patient reported values	9 (82)
Data are not able to be collected	2 (18)
Blood pressure data from patients that monitor their blood pressure at home is obtained by <sup>a</sup>	
Accessing the patient's electronic medical record	1 (9)
Contacting the provider's office	5 (45)
Patient reported values	11 (100)
Data are not able to be collected	2 (18)
Pharmacy monitoring	1 (9)
Blood glucose data from patients that monitor their blood glucose at home is obtained by <sup>a</sup>	
Accessing the patient's electronic medical record	0 (0)
Contacting the provider's office	5 (45)
Patient reported values	11 (100)
Data are not able to be collected	2 (18)
Pharmacy monitoring	1 (9)

<sup>a</sup> Indicates a question where sites were allowed to enter free text describing information or select all that applied.



**Fig. 1.** Changes that occurred to CMM delivery at participating organizations as a result of COVID-19.

The next components of the FRAME specify what was modified and the nature of the modifications. Five broad categories of adaptations were made to the delivery of CMM as a result of COVID-19. Most modifications were contextual in nature changing the setting or mode of delivery, but one modification (i.e., increased time between CMM follow-up visits) was to the CMM intervention content.

### 3.1. Increased time between CMM follow-up visits

Pharmacists often followed up with patients when they would come into the pharmacy for a medication refill. However, during COVID-19, many patients sought 90-day supply fills of their medications to minimize outside exposure or utilized drive-through windows to pick up medications. As a result, the length of time between CMM follow-up visits was often extended or did not occur.

### 3.2. Increased virtual or remote delivery of CMM

The setting of CMM visits changed as face-to-face visits were not an option in the early phases of the pandemic, so all visits needed to occur virtually or telephonically. This adaptation is illustrated in Fig. 1, where the percent of CMM encounters and follow-up visits that occurred remote or telephonically increased dramatically after the emergence of COVID-19.

### 3.3. Delaying CMM visits

Given competing demands, many pharmacies focused their efforts on other urgent tasks, which resulted in delaying CMM delivery in some instances. Early in the pandemic, payers reduced limits on early refills and 90-day fills, and many patients rushed to fill prescriptions in anticipation of supply chain disruption or pharmacy closures. Later in the pandemic year, influenza season and immunization efforts also required a shift in staff resources and demands.

### 3.4. Need for personal protective equipment (PPE)

Another contextual change to the delivery of CMM was the necessity of safety mechanisms for in-person CMM delivery. To protect themselves and patients, pharmacists began to wear PPE, such as face masks, face shields, and gowns, if a face-to-face CMM encounter did occur with a patient.

### 3.5. Obtaining clinical patient information

Prior to COVID-19, some pharmacies relied on point-of-care testing to gather clinical information within the pharmacy, such as A1c and blood pressure. However, this was not a feasible option as many pharmacies suspended these services as a result of the pandemic. Complicating things further, many provider offices were closed or had limited hours and services during earlier stages of the pandemic. Therefore, the mechanism to obtain necessary clinical information had to be modified to either gather it from the patient or rely on previously obtained data. As shown in Fig. 1, sites increased their reliance on using home blood pressure monitoring to obtain clinical blood pressure data from patients where previously other means were used to obtain this data.

### 3.6. CMM staff changes

Lastly, personnel for CMM support staff fluctuated during the pandemic as dispensing disruptions (e.g., patients seeking early fills of medications, staff needing to carry out prescriptions to patients' cars) affected CMM operations along with staff quarantining if a pharmacy staff person was exposed to or contracted COVID-19.

The final components of the FRAME include for whom the modification was made, if the adaptations still allowed CMM to be carried out with fidelity, and the reasons for the adaptations. Adaptations were made at the patient level, as well as at the organizational and provider-level. There were a number of different goals driving the modifications that occurred. These include ensuring patient and provider safety, improving patient access to CMM services, and improving the feasibility of delivering CMM given the environment of COVID-19. Contextual factors that influenced these adaptations were local and national public health recommendations (e.g., social distancing) as well as emergent policies (e.g., stay-at-home orders). Despite the adaptations that occurred, this did not significantly affect pharmacists' ability to follow the CMM patient care process.<sup>11</sup> Therefore, most modifications were fidelity-consistent with the CMM model.

## 4. Discussion

This study highlighted some of the key adaptations that were made to the delivery of CMM in community pharmacies during COVID-19. A number of adaptations that were made in the community pharmacy setting are temporary, such as short-term staffing changes and the need for PPE,

**Table 2**  
Adaptations made to CMM delivery in community pharmacies during COVID-19 using the FRAME.

1. When in the implementation process did the modification occur? Modifications occurred within the implementation, scale up, and maintenance phases of CMM
2. Were adaptations planned? Modifications were reactive to COVID-19
3. Who determined that the modification should be made? <ul style="list-style-type: none"> <li>• Pharmacy managers</li> <li>• CMM practitioners</li> <li>• Patients</li> <li>• State organizations (i.e., Minnesota Department of Human Services and the Minnesota Board of Pharmacy)</li> </ul>
4/5. What was modified and what was the nature of the modification? <ul style="list-style-type: none"> <li>• Some pharmacists preferred to follow up with CMM patients when they came in to the pharmacy for a medication refill. However, with many patients pursuing 90-day fills of their medications, CMM follow ups did not occur as frequently. Therefore, the nature of the adaptation was extending the time between CMM follow-ups in some cases.</li> <li>• As face-to-face visits were not an option in the early phases of COVID-19. As a result, the setting of CMM visits changed to virtual or telephonic.</li> <li>• Delivery of CMM was also delayed as some pharmacies prioritized completing medication fills and providing influenza immunizations during flu season.</li> <li>• The format of CMM visits had to be adapted due to pharmacists' sometimes limited ability to obtain patient clinical data. For example, prior to COVID-19, some pharmacies relied on point of care testing to gather clinical information within the pharmacy, such as A1c and blood pressure. In the early phases of COVID-19, many provider offices were closed or had limited hours. Therefore, pharmacists had to modify their approach to collecting clinical data and obtain patient self-reported values or rely of previously documented values.</li> <li>• The format of CMM was also modified in that if a face-to-face visit did occur with a patient, personal protective equipment (PPE) was required.</li> <li>• CMM personnel also faced adaptations due to COVID-19. For example, pharmacy staff busy filling 90-day orders, taking prescriptions out to patients' cars, etc. Personnel was also limited if pharmacy staff had to quarantine if there was a COVID-19 exposure.</li> </ul>
6. At what level of delivery (for whom/what was the modification made)? Adaptations were made at the patient-level and organizational-level
7. Was the modification fidelity-consistent? Fidelity to CMM was maintained despite the adaptations
8. What were the reasons for the modification? Goals <ul style="list-style-type: none"> <li>• Improve provider safety</li> <li>• Improve feasibility of delivering CMM during COVID-19 restrictions</li> <li>• Improve acceptability from patient perspective</li> <li>• Improve patient access</li> <li>• Improve patient comfort/safety</li> </ul> Contextual factors that influenced the decision <ul style="list-style-type: none"> <li>• Emergent policies</li> <li>• Local and national public health recommendations</li> </ul>

but other adaptations may be long-term and continue beyond the COVID-19 pandemic. For example, although telemedicine has existed for years, several barriers, such as payment and provider uptake had limited its use to expand access to care in the past.<sup>12–14</sup> Yet, with the rapid rise of telehealth delivery of care over the past year, this may be an adaptation that both patients and pharmacists choose to maintain. In addition, pharmacists indicated there was an increase use of home blood pressure monitoring among CMM patients after COVID-19. It is unknown if this will be sustained beyond the pandemic, as well as the effect this has on CMM delivery.

The FRAME was developed based on adaptations presented in a variety of studies in the literature.<sup>6</sup> Given the broad nature of the framework, applying the FRAME to CMM delivery during such unique times required frequent meetings with the research team to ensure that we were consistent in our understanding and application of the various pieces of the FRAME (e.g., interpretation and application of *content vs context* modifications). While the FRAME served as a useful tool to outline the various components to adaptations that occurred during COVID-19, it might be more suitable in future studies to adapt some of the FRAME terminology a priori to fit that particular intervention or service. In the case of CMM, the five components (collect, assess, plan, implement, follow-up) presented in the Joint Commission of Pharmacy Practitioners (JCPP) Pharmacists' Patient Care Process,<sup>11</sup>

for example, may be integrated into the FRAME to serve as more applicable categories to describe modifications that occurred.

Even before the pandemic, community pharmacists were recognized as one of the most accessible health care providers with frequent opportunities to deliver patient care.<sup>15</sup> With the emergence of COVID-19, some outpatient clinics had limited hours and/or access for patients, thus potentially increasing the patient need for CMM access during this time period. It is important to note that despite the disruptions that came with COVID-19 and the adaptations that needed to be made by community pharmacies, pharmacists were able to maintain fidelity to the CMM model during this time.

## 5. Limitations

There were a number of limitations to this study. This analysis was limited to field notes and survey responses; participating pharmacies may have experienced additional adaptations that were not captured in this report. In addition, the sample size was relatively small and may limit applicability of findings outside of the collaborative. Furthermore, a single representative from each organization completed the survey on behalf of the organization as a whole, and as such, there is a possibility that individual pharmacists within the organization may feel differently than the responses captured by the organizational lead. In addition, recall bias may have influenced participants' responses to the survey. This study was also limited to community pharmacies in Minnesota. Pharmacies outside of this geographic region may have had different public measures in place and variations in outbreak severity that may have impacted their adaptations differently.

## 6. Conclusion

This study is the first in pharmacy practice to systematically collect and report adaptations using the FRAME. Reactive adaptations due to COVID occurred during CMM implementation in community pharmacies. Despite these modifications, community pharmacies continued to provide access and care to patients when access to other health settings and services were limited.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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