ORIGINAL RESEARCH

Impact of a Pharmacist-Run Electronic Consult Service in a Network of Primary Care Patient-Centered Medical Homes

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Background: **Electronic consults (eConsults) allow for asynchronous, consultative, provider-to-provider communication. A pharmacy run eConsult service was initiated in a group of primary care clinics composed of 60 attending internal medicine primary care physicians (PCP), 100 internal medicine residents, and 10 pharmacists serving more than 60,000 patients. This study aims to describe (1) the number and types of eConsults placed to pharmacists; (2) the number of eConsults completed, converted to an office visit, or declined by a pharmacist; (3) the number of pharmacist recommendations made and implemented within 30 days of eConsult placement; and (4) PCP perceptions of the eConsult service.**

Design: **A retrospective chart review of all pharmacy eConsults placed between February 25, 2020, and July 6, 2021, was completed to describe eConsult utilization. In addition, an electronic survey was used to assess attending physician perceptions of pharmacy eConsults.**

Results: **A total of 513 eConsults were placed during the study period. The most common type of eConsult placed was "cost savings/formulary med questions" (110, 21.4%). Of the 435 eConsults completed by a pharmacist, 339 (78%) eConsults resulted in specific recommendations for medication therapy and 332 (98%) of these recommendations were implemented by the PCP. A total of 17 PCPs completed the survey assessing the perceived benefits of pharmacy eConsults. The top perceived benefits were improvement in patient outcomes (15, 88%) and ability to save provider time spent on patient care (14, 82%).**

Conclusions: **eConsults to pharmacists resulted in specific drug therapy recommendations that were routinely implemented by PCPs and perceived as a benefit to both providers and patients. (J Am Board Fam Med 2023;36:425–430.)**

Keywords: **Patient-Centered Medical Home, Pharmacists, Primary Health Care, Referral and Consultation, Remote Consultation, Retrospective Studies, Veterans Health Administration, Workforce**

Introduction

Electronic consults (eConsults) are defined as "asynchronous, consultative, provider-to-provider communications within a shared electronic health record (EHR) or web-based platform."[1] eConsults allow primary care providers (PCPs) to elicit the help of specialists in caring for their patients without the need for placing a referral or scheduling the patient to see the specialist. A meta-analysis examining the ability of eConsults to improve access to specialty care found a shorter response time with eConsults compared with traditional referrals, as well as fewer inappropriate clinic visits.[1]

There are several studies depicting the utilization and impact of eConsults to specialty and consult pharmacists in various practice settings including the Veterans Affairs (VA) health system, Canada, and primary care offices without embedded pharmacists. In the VA health system, eConsults in areas including mental health management, toxicology screening, and pain management were evaluated.[2–4] Results from these studies indicated that 93.5% of patients were able to remain in primary care without a referral to a specialist as a result of the eConsult to a mental health

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pharmacist. Similarly, 50% of pharmacist recommendations made as a result of an eConsult to pain management pharmacists were implemented.[2–4]

The utilization of Champlain BASE (Building Access to Specialists through eConsultation), an eConsult service using an online platform in Canada that connects primary care providers and outside specialists through use of an eConsult, has also been assessed.[5–7] Results of these studies revealed that the most utilized specialist via the eConsult service was the clinical pharmacist, resulting in 1.5 eConsults per month. A second study showed that 58.7% of eConsults placed for recommendations about HIV management were related to drug treatment.[6,7]

Another study looked at the implementation of a pharmacist eConsult service in primary care practices that do not have pharmacists embedded in their clinics. The eConsult platform was a secure web-based portal that allowed for transmission of clinical questions along with supporting documents from the EHR to the clinical pharmacist.[8] This study found that a total of 310 pharmacist recommendations were made for the 57 eConsults (5.4 recommendations per eConsult) and that 42 pharmacist eConsult responses (74%) had at least half of the recommendations implemented and documented in the patient's EHR care plan within 3 months.[8]

There are currently no studies assessing the impact or perception of eConsult services provided by pharmacists embedded in primary care clinics. This study will describe the use and PCPs perceptions of eConsults placed to primary care pharmacists that are embedded in a network of academic patient-centered medical homes (PCMHs).

The primary objective of this study was to describe the number and types of eConsults placed to pharmacists in a network of primary care PCMHs. The secondary objectives were to: (1) describe the number of eConsults completed by a pharmacist, converted to an office visit, or declined by a pharmacist; (2) quantify the number of pharmacist recommendations accepted and implemented by the PCP within 30 days of eConsult placement; and (3) evaluate PCP perceptions of the eConsult service.

Methods

Study Setting

This study took place at 7 National Committee for Quality Assurance (NCQA) PCMHs that are associated with a large academic medical center. The primary care team was made up of 64 attending internal medicine physicians and more than 100 internal medicine residents who served more than 60,000 patients. The pharmacy team embedded in the PCMHs was composed of 10 pharmacists (7.1 full time equivalent of pharmacist support) and 2 pharmacy residents. The pharmacists' responsibilities included chronic disease management, transitional care management, population health management, polypharmacy management, team-based care and eConsults.

The pharmacy eConsult service was implemented on February 25, 2020. The new service allowed PCPs to elicit pharmacist knowledge on a wide variety of medication related questions. The PCPs were required to consent patients to the service before placing the eConsult, which commonly occurred during an office visit, or after receiving a medication related question through patient contact outside of an office visit. When placing a pharmacy eConsult, PCPs were prompted to choose a pharmacy eConsult category. Available categories included adverse drug reaction review, cost savings/formulary medication question, dosing recommendation, drug interaction review, drug therapy recommendation, fall risk medication review, medication conversion recommendation, medication taper, and polypharmacy medication review. eConsults could also be placed without selecting a category. Once placed, the eConsult automatically routed to an EHR work pool to be reviewed and completed by a pharmacist. Pharmacists had 1 to 3 business days to complete, convert, or decline the eConsult. If the eConsult required patient outreach/contact, the eConsult was categorized as "converted" and a pharmacist completed the request at the first available visit slot, typically within 1 to 10 days, via a scheduled visit or patient outreach encounter. If the eConsult was better suited for pharmacist comanagement of a chronic disease state under a collaborative practice agreement, the eConsults was categorized as "declined" and the PCP was asked to place a referral to pharmacy. In each scenario, a message was sent to the PCP to inform them of the outcome.

Research Design

This study utilized a 2-step approach. First, pharmacists identified all pharmacy eConsults placed between February 25, 2020 – July 6, 2021 using an EHR-generated report. This report also included patient and PCP demographics; the type

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of eConsult placed; and the outcome of the eConsult. Pharmacists then completed a retrospective chart review of the EHR to determine (1) if a specific recommendation for change (start, stop or change in dose) in medication therapy was made by the pharmacist; and (2) if a specific recommendation was accepted and implemented by the referring provider within 30 days of eConsult placement.

The second portion of the study utilized an emailed electronic survey, created using the Qualtrics online database, to gather information from all attending physicians practicing in the network of primary care PCMHs who consented to participate in the study. Survey questions are listed in Figure 1 of the Appendix.

Data Analysis

The data collected via chart review and survey responses were analyzed using descriptive statistics.

Results

Utilization of eConsult to Pharmacy

A total of 513 eConsults to pharmacy were placed during the study period. Table 1 describes the quantity of eConsults placed in each of the 10 available categories. The 2 most common categories selected for eConsults were cost savings/formulary medication questions (110, 21.4%), and drug therapy recommendation (106, 20.7%). The least utilized eConsult categories selected were fall risk medication review (1, 0.2%) and polypharmacy medication review (28, 5.5%).

Figure 1. Survey of primary care provider's perception of pharmacist eConsults. Abbreviation: wRVU, work relative value units – a standard unit of measurement used to establish value for common health care procedures.

Please answer the following survey:

1. Identify your role within OSU General Internal Medicine
   a. Resident physician
   b. Attending physician
   c. Nurse practitioner
2. How many years have you been in practice?
   a. 0-5 years
   b. 6-10 years
   c. 11-15 years
   d. 16-20 years
   e. >20 years
3. Have you placed an eConsult to pharmacy?
   a. Yes
   b. No – If No is chosen, survey will end
4. Please choose the answer than represents how you feel about the following statement: The eConsult to pharmacy enhances my ability to provide safe and effective care for my patients.
   a. Strongly agree
   b. Somewhat agree
   c. Neither agree nor disagree
   d. Somewhat disagree
   e. Strongly disagree
5. For each eConsult to pharmacy placed, I estimate that I save about ___ minutes in providing care for the patient:
   a. 0-5 minutes
   b. 6-10 minutes
   c. 11-15 minutes
   d. 16-30 minutes
   e. >30 minutes
6. Please select the top 3 benefits of an eConsult to pharmacy.
   a. Improvement in patient outcome(s)
   b. Decrease in risk for adverse drug event
   c. Ability to bill the eConsult as a physician resulting in wRVU
   d. Ability to save money for health-system
   e. Ability to save money for the patient
   f. Ability to save provider time spent on patient care
   g. Improvement in efficiency of or time until clinical intervention(s) for patient
   h. Decrease in need for referral to other specialists
   i. Other (please comment)
7. Please rate the overall value of the eConsult to pharmacy service for your patient.
   a. Very valuable
   b. Somewhat valuable
   c. Neither valuable nor not valuable
8. Please enter any additional comments that you would like to share about the eConsult to pharmacy service.

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Table 1. Utilization of Pharmacy eConsult by Category

Type of eConsult (n = 513)	N (%)
Cost savings/formulary medication question	110 (21.4)
Drug therapy recommendation	106 (20.7)
No category selected	77 (15)
Adverse drug reaction review	48 (9.4)
Drug interaction review	42 (8.2)
Medication conversion recommendation	35 (6.8)
Dosing recommendation	34 (6.6)
Medication taper	32 (6.2)
Polypharmacy medication review	28 (5.5)
Fall risk medication review	1 (0.2)

Of the 513 eConsults placed, 435 (84.8%) were completed, 54 (10.5%) were converted to a telehealth or office visit, and 24 (4.7%) were declined by the pharmacy team. Out of the 435 eConsults completed by a pharmacist, 339 (78%) resulted in specific recommendations for a change in medication therapy and 332 (98%) of these recommendations were implemented by the PCP within 30 days of eConsult placement (Figure 2).

PCP Survey Results

There were 64 PCPs working in the PCMH during the study period. A total of 34 (53%) PCP responded to the survey and of the 34 that responded, 14 (41.2%) completed every survey question.

PCP perception of the pharmacy eConsult service on his or her ability to provide safe and effective care for patients was assessed by asking "Please choose the answer that represents how you feel about the following statement: The eConsult to pharmacy enhances my ability to provide safe and effective care for my patients." A total of 24 PCPs responded to this question, with 23 (95.8%) PCPs selecting "strongly agree" and 1 (4.2%) PCP selecting "somewhat agree."

PCP perception of time saved in providing patient care as a result of pharmacy eConsult use is depicted in Figure 3.

A total of 17 (50%) PCPs completed the survey question assessing the top 3 perceived benefits of pharmacy eConsults (Figure 4). The most selected pharmacy eConsult benefits identified by providers were improvement in patient outcomes (15, 88%); ability to save provider time spent on patient care (14, 82%); decrease in risk for adverse event (10, 59%); and improvement in efficiency of, or time until, clinical intervention(s) for a patient (10, 59%).

When asked to rate the overall value of the pharmacy eConsult service for patients, all 14 (100%) PCPs who responded rated this service as "very valuable" for their patients.

Discussion

This study showed that a pharmacist-run eConsult service within a network of primary care patient-centered medical homes is highly utilized. The least utilized pharmacy eConsult categories were fall risk medication review and polypharmacy medication review. Performing medication reviews often requires a patient to have an office or telehealth visit so the pharmacist can review patients' medications in real time. The low utilization of these categories depicted in this study may be the result of PCPs asking for patients to be scheduled for a visit with the pharmacist instead of placing an eConsult. Similarly, pharmacist utilization for medication

Figure 2. Pharmacist recommendations made and implemented as result of an eConsult. Abbreviation: PCP, primary care physicians.

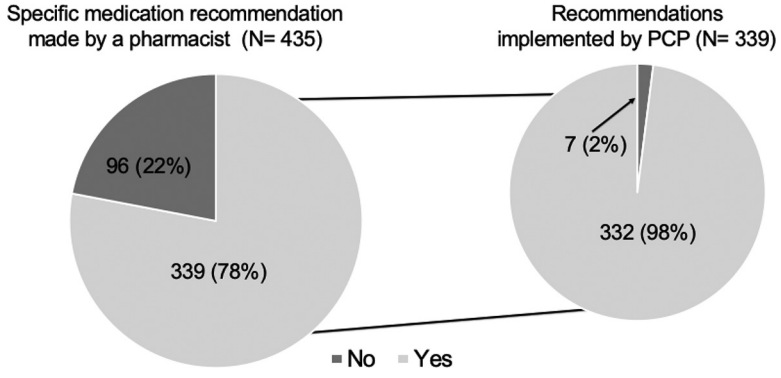

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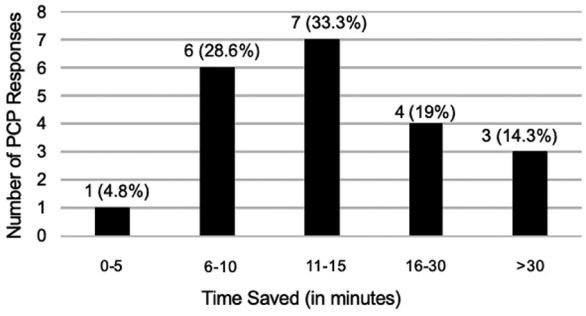
Figure 3. Primary care provider perception of time saved in providing patient care as a result of an eConsult (n = 21).



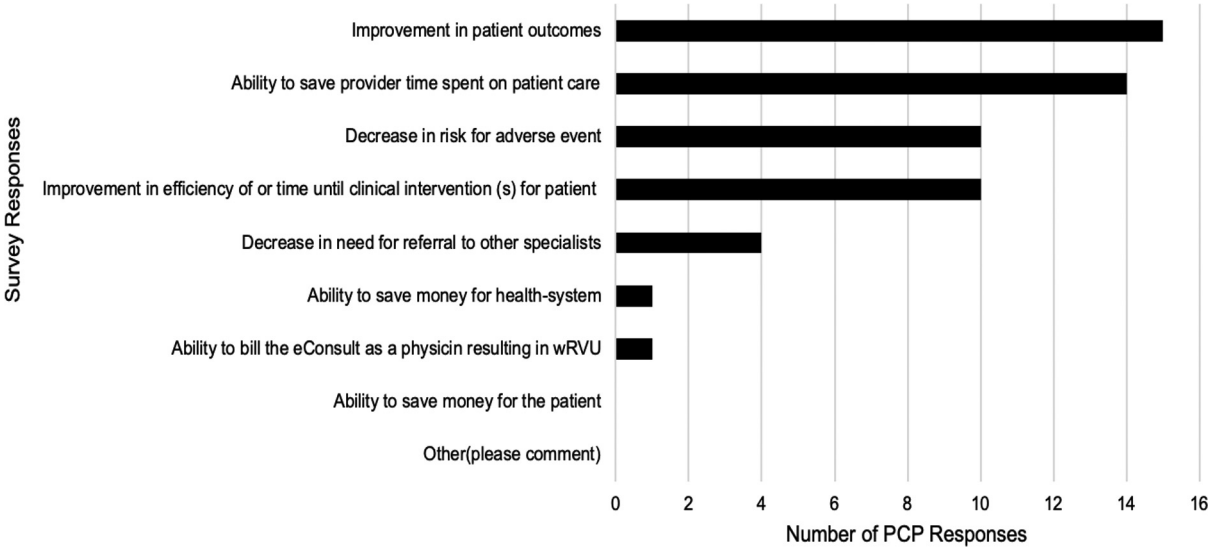
recommendations is likely underrepresented by the outcomes of this study. Pharmacists practicing in the study PCMHs manage chronic diseases and provide comprehensive medication reviews through use of collaborative practice agreements (CPA). Thus, many patients may have been referred for pharmacist management via CPA for a medication or polypharmacy recommendation as ongoing management by a pharmacist was preferred over a 1-time consult.

In addition to the high utilization of this service, 98% of the recommendations provided by a pharmacist were implemented by the PCP within 30 days of eConsult placement. This implementation rate is much higher than previous studies showing implementation rates ranging 48 to 88%.[1–8] This study took place in a network of PCMHs with embedded pharmacists who have been working closely with other providers for more than 10 years. Strong interprofessional relationships and clear, concise communication systems have been created during this time likely contributing to the impact of the pharmacy eConsult service.

In addition to depicting the high utilization of pharmacy eConsults, this study illustrated that PCPs perceived the pharmacy eConsult service as a benefit to both providers and patients. These perceived benefits included improvement in patient outcomes, medication safety, and care efficiency highlighting the integral role of the pharmacist in providing high-value primary care. As the United States health care system continues to increase quality care incentives, this study highlights PCPs perception of the pharmacist's value in primary care.

One limitation of this study results from the close collaboration between PCPs and pharmacists in these PCMHs which results in providers commonly consulting pharmacists in real time instead of placing a pharmacy eConsult. This may have decreased the measured impact shown in this study. Future research is still needed to describe the impact of pharmacy eConsult utilization on patient

Figure 4. Top 3 perceived benefits of pharmacy eConsult based on primary care provider survey response (n = 55). Abbreviation: wRVU, work relative value units – a standard unit of measurement used to establish value for common health care procedures.



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outcomes and provider efficiency, despite the PCPs perception of their high utility. In addition, data regarding pharmacy eConsult sustainability, as many payors will not reimburse pharmacists for providing eConsults, is imperative to determine feasibility in future health care practices.

The eConsult service continues to be utilized after the completion of the study. In conclusion, our study demonstrates that a pharmacy eConsult service in a network of primary care PCMHs is highly utilized by PCPs and is perceived as a benefit to both providers and patients.

To see this article online, please go to: http://jabfm.org/content/36/3/425.full.

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