

## Research paper

# Pharmacist-generated electronic consults to improve hypertension management in a multisite health centre: pilot study

Marissa Salvo PharmD  
Assistant Clinical Professor

Stefanie C Nigro PharmD BCACP BC-ADM C-TTS  
Assistant Clinical Professor

School of Pharmacy, University of Connecticut, Storrs, CT, USA

Deborah Ward RN  
Quality Improvement Manager, Community Health Center, Inc., Middletown, CT, USA

### ABSTRACT

**Background** Utilisation of the electronic medical record (EMR) is believed to facilitate timely access to patient information, enhance communication between care team members and further promote clinical decision support.

**Objective** To determine if pharmacist-generated electronic consults (e-consults) improve blood pressure control among patients with uncontrolled hypertension in a multisite health centre.

**Methods** Pharmacists generated hypertension medication e-consults with review by primary care provider (PCP) during the patient appointment. We conducted a retrospective review of consults to determine types of pharmacist recommendations, PCP acceptance rates, and blood pressure changes.

**Results** Pharmacists generated a total of 60 e-consults, 41 patients with a systolic blood pressure above their respective goal; e-consults were accepted 46% ( $n = 19$ ) of the time.

**Conclusion** This pilot project demonstrates a unique way for pharmacists to proactively utilise the EMR when delivering coordinated care within a multisite health centre. In addition, pharmacists were successfully integrated into the planned care approach.

**Keywords:** electronic medical record, health centre, health information technology, pharmacist

#### What is known about the subject?

- Electronic medical records facilitate real-time communication among care team members to promote team-based care.
- Electronic medical records may help improve patient-oriented outcomes through care coordination and planning.
- When focused on hypertension management, involvement of a clinical pharmacist can improve medication adherence, blood pressure control and reduce overall medical costs.

#### What this study adds

This project demonstrates a unique way for pharmacists to participate in delivering multidisciplinary care within a multisite health centre.

## Introduction

The patient-centred medical home (PCMH) is a progressive model of care which focuses on providing comprehensive primary care in a collaborative manner. Key elements include a team approach that is physician-directed and provides ongoing patient-oriented care, focus on safety and quality, and incorporation of enhanced patient access to care through inclusion of health information technology (HIT).<sup>1</sup> Pharmacist involvement in delivering comprehensive medication management ties into various aspects of the PCMH principles. In addition, ample evidence supports improved medication adherence rates and patient outcomes, enhanced patient engagement and reduced medical costs when pharmacists are involved in multidisciplinary care teams.<sup>2,3</sup>

Two residency-trained, clinical pharmacists provide medication therapy management services in a multisite statewide health centre and nationally recognised PCMH. Healthcare services of the organisation include comprehensive medical, behavioural and dental care in primary care sites, homeless shelters, school-based systems and mobile locations. The healthcare organisation, including its home for underserved and special populations, has practices located across the state of Connecticut and serves over 130 000 patients each year. However, despite 13 locations throughout the state, each pharmacist has only one primary practice site.

An organisation-wide review of blood pressure control showed 45% of all patients diagnosed with hypertension were not at a goal blood pressure of  $\leq 140/90$  mmHg or  $\leq 130/80$  mmHg according to the goals set forth by the seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7).<sup>4</sup> Hypertension remains a crucial area of concern as it is an independent risk factor for heart attack, stroke and renal disease.<sup>4</sup> Despite the availability of safe and effective medications, national data suggests that nearly 35% of US adults with diagnosed hypertension who take antihypertensive therapy do not achieve their respective blood pressure goal.<sup>5</sup>

To overcome both treatment inertia and patient disengagement with the healthcare system, a quality improvement (QI) project was designed to improve blood pressure control across the organisation through the use of HIT. At the core of this QI initiative was the development and utilisation of electronic medical record (EMR)-generated scorecards and incorporation of pharmacist-generated electronic consults (e-consults). Because the EMR is central to the PCMH framework, it was hypothesised that utilisation of the EMR would facilitate timely access to patient infor-

mation, enhance communication between care team members and further promote clinical decision support.

## Methods

Because the e-consult process was part of a pilot QI initiative for hypertension management, each pharmacist reviewed a preselected primary care provider's (PCP's) patient panel; two PCPs participated in this pilot initiative. The pharmacist and provider were not always located at the same practice site. For this initiative, pharmacists electronically received a weekly computer-generated report that identified patients with an upcoming appointment in the next week and uncontrolled hypertension based on JNC-7 guidelines.<sup>4</sup> Reports contained an 18-month average systolic blood pressure and diastolic blood pressure, last systolic blood pressure and diastolic blood pressure, date of appointment and PCP name. E-consults were not generated for patients who achieved their blood pressure goal.

The pharmacist utilised the EMR to review each patient's medical record. The process included review of the patient's medication regimen, laboratory measures, vital signs, lifestyle habits, education received and, when necessary, a call to the patient's pharmacy to assess medication adherence. Following a comprehensive review, the pharmacist generated an e-consult in the patient's EMR. All components of the review were documented, in addition to the pharmacist's assessment and pharmacological and non-pharmacological recommendations. The pharmacist sent the e-consult to the PCP for review prior to the patient's appointment. During the visit, the PCP elected to accept or decline the pharmacist's recommendation(s).

We conducted a retrospective review of the existing e-consults to determine types of recommendations, PCP acceptance rate and change in blood pressure. Owing to the study's retrospective nature, no direct contact between pharmacists and patients was made in the data collection or analysis process. All patient information was collected using password protected software to assure compliance with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. The project was exempt from full review by the health centre's institutional review board.

## Results

Patient demographics and characteristics are in Table 1. Using the EMR, pharmacists generated a total of 60 e-

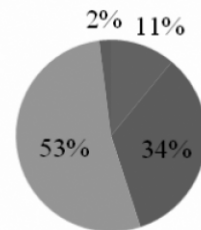
**Table 1** Patient demographics and characteristics

Baseline characteristics ( <i>n</i> = 60)	
Age (years)	55 ± 13
Median	56
Interquartile range	16.75
Female, <i>n</i> (%)	35 (58)
Race, <i>n</i> (%)	
Caucasian	26 (43)
Hispanic	24 (40)
Black	7 (12)
Other	3 (5)
Language spoken, <i>n</i> (%)	
English	39 (65)
Spanish	15 (25)
Other	5 (8)
Tobacco abuse, <i>n</i> (%)	12 (20)
Co-morbid diabetes, <i>n</i> (%)	35 (58)
BP goal <sup>a</sup> , <i>n</i> (%)	
≤ 140/90 mmHg	20 (33)
≤ 130/80 mmHg	40 (67)
Number of prescribed antihypertensives, <i>n</i> (%)	
0–1	19 (32)
2–3	33 (55)
≥ 4	8 (14)
18-month BP average (mmHg)	
Systolic	148 ± 15
Diastolic	86 ± 8

<sup>a</sup> As indicated by the JNC-7 guidelines.<sup>4</sup>

consults between September and December 2010. The PCPs reviewed all submitted pharmacist e-consults prior to the patient visit. Forty-one patients presented to their scheduled office visit with a systolic blood pressure above the respective goal of ≤ 140 mmHg or ≤ 130 mmHg per clinical practice guidelines.<sup>4</sup> Of the 41 patient encounters, the responsible PCP elected to accept the pharmacologic recommendations proposed by the pharmacist 19 times (46%). Recommendations that were not accepted could be used at a future visit, since all e-consults became a permanent part of the patient's EMR. Reasons for a declined recommendation included, but were not limited to, patient reports of medication non-adherence, other specialists managing hypertension or patient refusal for additional medication. Prior to the intervention period,

- Change to an alternative antihypertensive agent
- Add a new antihypertensive agent
- Increase dose of current antihypertensive agent
- Discontinue antihypertensive agent

**Figure 1** Pharmacotherapy recommendations

blood pressure control rates for the participating PCPs were 59.73 and 56.68%. By December 2010, control rates were 60.5 and 55.43%, respectively.

The pharmacists proposed a total of 67 pharmacotherapeutic recommendations for PCP consideration, with an average of 1.1 recommendations per patient. Figure 1 represents the types of drug therapy recommendations suggested by the pharmacists. In addition, the pharmacists suggested an additional 62 non-pharmacologic strategies, including education on sodium restriction, adaptation of the Dietary Approaches to Stop Hypertension (DASH) diet and tobacco cessation to name a few.

## Discussion

With multiple locations across the state and two clinical pharmacists within the organisation, utilisation of HIT allows pharmacists to actively participate in patient care coordination and planning. When focused on hypertension management, involvement of a clinical pharmacist has consistently demonstrated improvements in medication adherence, blood pressure control and reduced overall medical costs.<sup>3,6,7</sup> Recommendations made (by pharmacists) to physicians and the use of hypertension treatment algorithms, along with patient counselling about lifestyle modifications, are considered the most effective team-based interventions.<sup>6</sup> Compared with previous studies, our pilot project demonstrates a unique and proactive way for pharmacists to offer medical expertise without direct face-to-face contact with patients or medical providers.

Although this was a proactive approach to providing clinical pharmacy services, the pharmacist's evaluation of the patient's EMR took place prior to the

actual encounter. Subsequently, pharmacists relied heavily on past blood pressure and average blood pressure readings obtained from flowsheets and progress notes when making recommendations. Current blood pressure readings were not assessed by the pharmacist in the e-consult, but rather by the PCP during the patient encounter. Often, it was this isolated blood pressure reading that largely influenced if therapy would be added, discontinued, or modified. Access to temporal data views as suggested by Samal and colleagues may have offered the pharmacists and PCPs a more practical way to visualise blood pressure trends and make connections between blood pressures and prior interventions.<sup>8</sup> Variables, not clearly documented during retrospective chart evaluation, limited the interpretation of recommendations; therefore, collected data broadly categorises the types of pharmacist recommendations.

With the prevalence of chronic disease on the rise, coordinated interventions are needed to reduce death rates and healthcare spending. In 2000, more than 125 million Americans had at least one chronic care condition. By 2020, it is estimated to grow to 157 million Americans.<sup>9</sup> Identification of high-risk patients in need of treatment and preventative medicine begins in primary care settings. Utilising an EMR facilitates access to such information, while maintaining confidentiality, in order to deliver patient care.<sup>10</sup> EMRs also promote multidisciplinary, patient-centred care through communication strategies beyond progress notes.<sup>11</sup> Our pilot demonstrated such a strategy through specialist consultation in the form of e-consults. Specific to hypertension management, long-term evaluation and spread of this programme is necessary to assess the impact of pharmacist-generated e-consults on blood pressure control.

Our practice innovation demonstrates a unique way for pharmacists to proactively utilise HIT when delivering coordinated, team-based care within a multi-site health centre.

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#### CONFLICT OF INTEREST

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#### ADDRESS FOR CORRESPONDENCE

Stefanie C Nigro  
University of Connecticut  
69 North Eagleville Road Unit 3092  
Storrs, CT 06269  
USA  
Fax: +1 860 486 8152  
Email: stefanie.nigro@uconn.edu

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