



Primary Care Consultant Program at Cambridge Health Alliance: Evaluation of the Pilot Program and the Feasibility of Its Expansion

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Primary Care Consultant Program at Cambridge Health Alliance

Evaluation of the pilot program and the feasibility of its expansion

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Report prepared for the Department of Medicine at Cambridge Health Alliance

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Executive Summary

Introduction

On January 1, 2015, Cambridge Health Alliance (CHA) Department of Medicine transitioned from the traditional inpatient model practiced by seven PCPs to the hospitalist model of care. A pilot program, “PCP Consultant Program,” incorporated these seven PCPs into inpatient care as consultants. In this pilot program, PCP consultants visit once or twice during a patient’s hospitalization, providing care the PCP considered relevant: a focused exam, insight into prior care, discussion of care decisions with the patient and family, and assistance in planning after-hospital care. PCPs consultants’ services are reimbursed by CHA for this pilot program. A year after the implementation of the pilot program, CHA Department of Medicine must decide whether the pilot program should be expanded to include all CHA-affiliated PCPs, including internists and family medicine physicians.

Findings

Need Assessment: Patient Satisfaction

- 77% of 199 interviewed patients with CHA-affiliated PCPs reported that the PCP involvement in inpatient care would be helpful
- Older patients (50 or older), higher education (more than 12 years of education), and higher PCP ratings were associated with patients valuing PCP involvement during their hospitalization
- Factors associated with patients’ valuation of PCP involvement can be used to identify patients who would most benefit from PCP consultation

Process Evaluation: Perspectives of PCP Consultants, Hospitalists, and Residents

- In pre-consultation phase, the program must clarify the process for initiating a consultation (who should initiate, whom to contact, and how to initiate)
- During consultation, the program must define “areas of expertise” of PCP consultants
- In post-consultation phase, the program need to structure a communication pathway for PCP consultants to relay their recommendations to inpatient providers

Outcome Evaluation: Patient Outcomes related to the Pilot Program

- The non-consultants’ average readmission rate increased over time by 5% more than the PCP consultants’ average readmission rate over time ($p=0.11$)
- The non-consultants’ average number ED admissions per PCP decreased over time by 7.7 patients more than the PCP-consultants’ average number of ED admissions per PCP decreased over time ($p=0.78$)

Feasibility Assessment: Cost of Pilot Program and Estimated Cost of Expansion

- Per year cost of the pilot program with six PCPs is \$22836
- Per year cost of expanding the program to include all 100 CHA-affiliated PCPs is \$65,098, which may be an overestimation

Recommendations

Based on the four criteria – patient satisfaction, operational feasibility, impact on patient outcomes, and financial feasibility – I recommend that CHA does not expand the pilot PCP Consultant Program. Instead, I advise CHA to continue its pilot program for another calendar year while the recommendations to improve the consultation process are implemented.

To improve the process of the existing pilot program, CHA Department of Medicine must:

1. Define the role of PCP consultant
2. Define PCP consultant's scope of recommendations
3. Allow team-based agenda setting
4. Standardize communication

In addition to improving the consultation process, CHA Department of Medicine should take the following steps towards making a case for expanding the pilot program:

1. Emphasize data gathering and improve analysis of patient outcomes
2. Assess PCP engagement and their willingness to serve as consultants
3. Secure a sustainable reimbursement model

I. Introduction

A. Background: Continuity of Care

Primary care is central to effective and efficient healthcare systems as it focuses on preventive medicine.¹ The core of primary care is “continuity of care,” an ongoing personal patient-doctor relationship. Continuity of care has been associated with improved patient satisfaction and improved management of chronic diseases like diabetes.² Studies have shown that certain groups of patients place more value on continuity of care in outpatient settings, including: seniors, new parents, patients with Medicare and Medicaid, chronically ill patients, females, and those with lower levels of education.³ Greater continuity of care and longer length of patient-doctor relationship with primary care doctors (PCPs) have been associated with greater patient satisfaction in outpatient settings.⁴

In the past quarter century, the role of PCPs in general medical inpatient care has diminished, replaced by hospitalists who specialize in inpatient care. There are many benefits to a hospitalist including more efficient care of similar quality, availability throughout the day to care for patients, and honed acute care skills.⁵ However, the resulting discontinuity of care raises concerns about fragmented care and patient dissatisfaction.^{6,7}

Attempts to mitigate the loss of continuity of care and longitudinal relationship in inpatient care have been focused on integrating primary physicians in form of informal “social visits.” These “social visits” lack clear guidelines. Primary physicians have reported usually or always visiting their hospitalized patients only 34% of the time, ineffectively bridging the value primary care to inpatients.¹

Several authors have proposed the model of “continuity visit” to describe a compensated encounter where a PCP is able to formally communicate with patients, endorse hospitalists, provide clinical insights, facilitate coordination care, and provide continuity of care.^{2,8} In providing continuity visits, primary physicians would work within a health system that makes it a standard practice to interact the patient and act as consultants to the inpatient team who maintains full attending-physician responsibilities.³

Although the values of continuity visits by PCPs in inpatient setting are largely speculative, several studies suggest that patients would desire PCP involvement in certain clinical settings. In the palliative care literature, several authors have shown that patients are family members

¹ Fan VS, Burman M, McDonell MB, Fihn SD. Continuity of care and other determinants of patient satisfaction with primary care. *Journal of General Internal Medicine* 2005;20:226-33.

² Goroll AH, Hunt DP. Bridging the hospitalist-primary care divide through collaborative care. *The New England journal of medicine* 2015;372:308-9.

³ Greysen SR, Detsky AS. Solving the puzzle of posthospital recovery: What is the role of the individual physician? *Journal of hospital medicine* 2015;10:697-700.

⁴ Kuo YF, Sharma G, Freeman JL, Goodwin JS. Growth in the care of older patients by hospitalists in the United States. *The New England journal of medicine* 2009;360:1102-12.

⁵ Pandhi N, Saultz JW. Patients' perceptions of interpersonal continuity of care. *Journal of the American Board of Family Medicine : JABFM* 2006;19:390-7.

⁶ White HL, Glazier RH. Do hospitalist physicians improve the quality of inpatient care delivery? A systematic review of process, efficiency and outcome measures. *BMC medicine* 2011;9:58.

⁷ Wachter RM, Goldman L. The emerging role of "hospitalists" in the American health care system. *The New England journal of medicine* 1996;335:514-7.

⁸ 4. Wachter RM, Pantilat SZ. The "continuity visit" and the hospitalist model of care. *Disease-a-month : DM* 2002;48:267-72.

feel abandoned when PCPs are not involved in their end-of-life discussions; moreover, PCPs want to and feel largely competent to provide palliative care in inpatient settings.^{9,10} In a qualitative study by Hruby and colleagues, patients were found to be similarly satisfied with hospitalists compared to PCPs as their physicians-of-record, but they wanted their PCPs to inform them of a serious diagnosis or discuss choices between medical and surgical management.

B. About the Client: Cambridge Health Alliance (CHA)

Cambridge Health Alliance (CHA) is an academic community health system committed to serving over 150,000 patients in Cambridge, Somerville, and Boston's metro-north region.¹¹ CHA is well known for its expertise in

primary care, mental health, and substance abuse as well as caring for diverse populations with complex medical and social needs. With its commitment to providing care to vulnerable communities, CHA constantly develops community and public health

"CHA is currently transforming its system to ensure excellent patient experiences and control healthcare costs. This work is important and meaningful, and will allow us to serve our patients today and in the future."

- About CHA, *Serving our Communities*

models that enable them to demonstrate effective new ways to integrate care and improve the well-being of, not only their patients, but also the communities. The CHA system also has well-established personal and population health functions. CHA operates the Public Health Department for the City of Cambridge, has a large community outreach team and a medical staff that actively collaborates in community projects and advocates around public policy issues. These teams work closely with municipalities and community groups to address broad health issues like tobacco use, obesity, childhood mental health and depression.

C. PCP Consultant Program: A Pilot Program

On January 1, 2015, CHA Department of Medicine transitioned from the traditional inpatient model practiced by seven PCPs to the hospitalist model of care. A pilot program, "PCP Consultant Program," incorporated these seven PCPs as consultants. PCP consultants visited once or twice during a patient's hospitalization, providing care the PCP considered relevant: a focused exam, insight into prior care, discussion of care decisions with the patient and family, and assistance in planning after-hospital care. PCPs were asked to submit billing information to CHA for all consult services for reimbursement. CHA has agreed to reimburse the PCP consultants in the pilot program for the first year of the pilot program and to evaluate the option of expanding it to include the 100 CHA-affiliated PCPs.

⁹ Back AL, Young JP, McCown E, Engelberg RA, Vig EK, Reinke LF, Wenrich MD, McGrath BB, Curtis JR. Arch Intern Med. 2009 Mar 9;169(5):474-9.

¹⁰ Silveira MJ, Forman J. J Gen Intern Med. 2012 Oct;27(10):1287-93.

¹¹ Cambridge Health Alliance Website, About CHA: <http://www.challiance.org/AboutCHA/AboutHome.aspx>

D. Problem Statement

Should CHA Department of Medicine expand the pilot PCP Consult Program to include all CHA-affiliated PCPs?

E. Policy Options

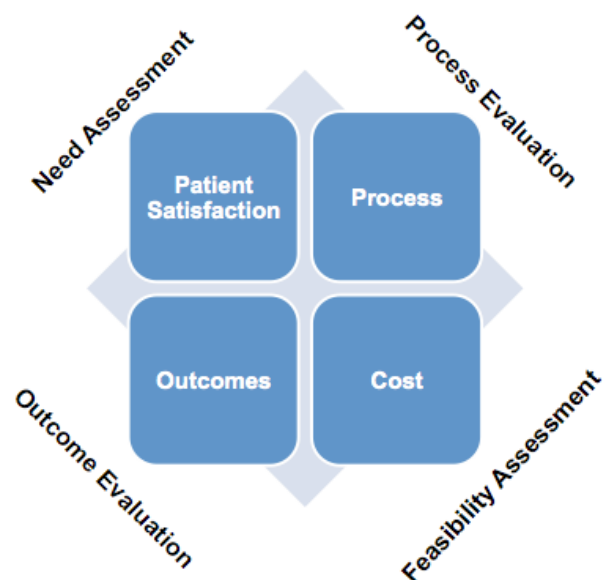
After a thorough evaluation process, CHA will consider the following policy options:

- **Option A, “Expansion”:** Expand the pilot program to include all CHA-affiliated PCPs, thereby allowing them to provide formal consult services for their patients on the medicine wards at the CHA hospitals. They will be reimbursed appropriately for their services.
- **Option B “Continuation”:** Do not expand the pilot program, but continue it while incorporating the recommendations to improve the consultation process.
- **Option C “Discontinuation”:** Discontinue the pilot program.

F. Methodology Overview

Program evaluation was conducted to generate evidence used for assessing three policy options. The four steps of the evaluation process include: (1) need assessment, (2) process evaluation, (3) feasibility assessment, and (4) outcome evaluation. Program evaluation is a major component of value-based health care, the goal of which is to lower health care costs and to improve quality and outcomes.

- **Stage 1:** Need assessment consists of estimating patients’ desire for involving PCPs in their inpatient care, which may improve patient satisfaction, a component of healthcare quality.
- **Stage 2:** Process evaluation examines the perceived PCP consultation process from the active participants of the program.
- **Stage 3:** Outcome evaluation focuses on the clinical outcomes of the patients with the PCP consultants before and after the program implementation.
- **Stage 4:** Feasibility assessment conducts cost analysis of the pilot program, which would inform the client the financial feasibility of the policy options under consideration.



II. Program Evaluation

A. Needs Assessment: Patient Perception of PCP Continuity Visit

Background

Continuity of care over time from a primary care physician (PCP) in the ambulatory setting results in better outcomes, lower cost of care, and higher patient satisfaction.¹² These improved outcomes appear to be mediated through increased adherence to prescribed medication, higher rates of preventive interventions, and improved coordination of care. The literature suggests that, in the ambulatory setting, patients from certain demographics may be more likely to prefer receiving care from their own PCP, particularly older patients, patients from the non-majority culture, and patients on public insurance, suggesting that trust and concordance of view of the medical issues may be important factors.¹³ Less is known about continuity of care between outpatient and inpatient venues. Moreover, there has been little assessment of patients' attitudes about maintaining PCP involvement during inpatient stays.

Understanding patients' perception of PCP involvement in hospitalist care is crucial to determining the potential value of the PCP Consultant Program. In hospital value-based purchasing program, quality of care is measured with two metrics:

patient satisfaction (30%) and

patient outcomes (70%).¹⁴ As a result, patient satisfaction carries the promise of rewards and the risk of penalties in reimbursement. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAPHS), the most commonly used measure of patient satisfaction, determined hospitals' loss or gain up to 1.5% of their Medicare payments in fiscal year 2015. The Centers for Medicare & Medicaid Services (CMS) will eventually increase the stakes to 2% of reimbursement by fiscal year 2017. The importance of patient satisfaction is also highlighted in CHA's recent announcement of its commitment to transforming its system to align with the Institute for Healthcare Improvement Triple Aim: (1) improve health of populations, (2) enhance the patient experience of care, and (3) reduce or control the costs of care. Positive perception of PCP involvement in inpatient care may imply PCP consultants' potentials to improve patient satisfaction, thereby the quality of health care at CHA. This section aims to assess the need (or preference) for PCP involvement in inpatient care, as voiced by patients themselves.

"CHA is transforming its system to align with the Institute for Healthcare Improvement Triple Aim: improve the health of populations, **enhance the patient experience of care**, and reduce or control the costs of care. This work is important and meaningful, and will allow us to serve our patients and communities into today's evolving healthcare landscape."

– *Our Transformation*, Cambridge Health Alliance

¹² Starfield B, Shi L, Macinko J. Milbank Q. Contribution of primary care to health systems and health. 2005;83(3):457-502.

¹³ Pandhi N, Saultz JW. Patients' perceptions of interpersonal continuity of care. Journal of the American Board of Family Medicine. 2006;19:390-7.

¹⁴ "Frequently Asked Questions: Hospital Value-Based Purchasing Program." Accessed April 6, 2015. <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/hospital-value-based-purchasing/Downloads/FY-2013-Program-Frequently-Asked-Questions-about-Hospital-VBP-3-9-12.pdf>

Methods

During the eight months of data collection (January – August, 2015), three research assistants from Harvard Medical School and Harvard School of Dental Medicine conducted semi-structured, in-person and telephone interviews with 199 patients with CHA-affiliated PCPs, being discharged from the Medicine Service at the CHA Cambridge Hospital. This research study received IRB approval from Harvard Medical School and Harvard School of Public Health.

Patients were asked questions about their demographics, their relationship with their PCP, any PCP continuity visits or telephone encounters that may have occurred during their hospitalization, and their perception of how continuity visits impacted or might have impacted their inpatient care (Appendix A). Each interview was transcribed verbatim. In the answers to the interview question, “We are trying to learn how patients feel about having their PCP involved in their inpatient care-- how do you feel about this?” a number of key themes were identified through a thematic and comparative analysis approach.¹⁵ Patient perspective for PCP involvement was conceptualized based on the coding of those examples drawn from the patients’ answers. The thematic analysis was used to go beyond the individual experience of every participant and to build a rich description of the qualitative data. Themes identified were grouped together and checked for consistency. To eliminate bias, the research assistants verified the data.

Data were reviewed using descriptive statistics for their preferences for involving PCP in inpatient care, age, gender, education level, race/ethnicity, self-reported health rating (scale of 0-10, 10 being most healthy), length of relationship with PCP, and PCP rating (scale of 0-10, 10 being most favorable). Data were analyzed using STATA Version 13 (StataCorp, College Station, TX). Multivariate variable logistic regression models were used to identify factors associated with having favorable views of PCP involvement in inpatient care.

Results

The mean age of patients interviewed was 62 years, with 44.2% male and 55.73 female. The average length of hospitalization was 3.61 days. 68% of patients self-identified as white and 18% as black. The mean length of patient-PCP relationships was 7.1 years. Patients’ mean self-reported health was 6.30 out of 10.

150 (77%) of patients reported that PCP involvement was or would be helpful. The main reasons noted included that their PCP would provide comfort and would have background knowledge relevant for their inpatient care. As shown in Table 1, patients also cited continuity of care, better communication, and support with medical decision making as reasons for desiring PCP involvement in inpatient care.

¹⁵ Boyatzis, R.E. (1998) Transforming qualitative information: Thematic analysis and code development. Thousand Oaks, London, & New Delhi: SAGE Publications.

Table 1: Key themes describing why patients value PCP involvement in inpatient care

Themes	Patient Quotes
PCP offers background knowledge	• “The PCP can talk about my medical history more than I can.” • “He would have had more experience with my health than the other doctor.” • “She would have been able to talk to the other doctors and give more background on health history.”
PCP offers comfort	• “I really like it because I’m a little bashful and when a doctor has to look at wounds on my backside the doctor looks like she might be under 18 years old and it makes me feel really uncomfortable.” • “My doctor would have been there to calm me down. She could have calmed me down. She does things where she sticks the needles in me while I’m standing up...I can’t lie down and she understands that. At the hospital they were almost hurting me to do so, and they didn’t care.”
PCP offers continuity of care	• “The PCP can talk about my medical history more than I can.” • “He would have had more experience with my health than the other doctor.” • “She would have been able to talk to the other doctors and give more background on health history.”
PCP communicates with patients	• “Usually when I’ve been in the hospital before my PCP has been able to give me a lot more information and tell me what’s going on.”
PCP is involved in decision making	• “My PCP can voice his or her opinion. I think it would be good to have them collaborate with each other.”

From the univariate logistic regression, age was significantly associated with patient’s preference for PCP involvement (Table 2). Patients aged 50 or above were more likely to desire PCP involvement compared to patients aged 18-49 (OR=2.61, $p=0.04$, CI 1.06-6.43). Similarly, patients with higher level of education (beyond high school) were also more likely to prefer PCP involvement in their inpatient care (OR=3.81, $p=0.01$, 95% CI=1.41-10.25). Although the length patient-PCP relationship was not associated with preference for PCP involvement, patients who gave high scores (8 or above) were more likely to desire continuity care by their PCP during hospitalization (OR=2.39, $p=0.04$, 95% CI 1.09-13.03).

Table 2: Univariate model of likelihood of desiring PCP involvement in inpatient care

	Number	Odds Ratio	p-value	95% CI
Age less than 50	46	reference group		
Age 50 or higher	137	2.61	0.04	1.06-6.43
Male	85	reference group		
Female	107	1.23	0.62	0.54-2.77
12 or fewer years of education	111	reference group		
More than 12 years of education	72	3.81	0.01	1.41-10.25
White	131	reference group		
Non-white	68	1.87	0.18	0.75-4.67
Self health rating below 8	123	reference group		
Self health rating at or above 8	76	0.45	0.06	0.19-1.04
Relationship with PCP for less than 5 years	89	reference group		
Relationship with PCP for more than 5 years	110	0.98	0.97	0.43-2.26
Score for PCP less than 8	20	reference group		
Score for PCP at or above 8	179	3.78	0.04	1.09-13.03

Discussion

Understanding patients' perception of PCP involvement in hospitalist care is crucial to determining the potential value of any innovative care models or policy changes to incorporate PCPs into inpatient care. In the current analysis, the majority of the patients reported that PCP involvement would be helpful, underlying the potential for continuity care to increase patient satisfaction. Patients appear to prefer PCP involvement in their inpatient care, likely due to the personal nature of their relationship with their provider and to their desire for informational continuity of care.

Patients who value continuity in inpatient care tend to be older and more educated. They also rate their own health poorly and give higher score to their PCPs. The association between patients' rating of their PCPs and their preference for PCP involvement also highlights how patients value having contact with providers whom they like and know well. Older patients and those with poorer reported health are likely to have multiple medical conditions, which are managed by their PCPs in outpatient settings. Naturally, these patients are likely to desire involving their PCPs who can provide background knowledge to the inpatient team.

This study sample lacked sufficient statistical power to detect an association with severity of illness or mortality score. Nonetheless, the significant associations with older age and poorer reported health suggest a potential importance of level of morbidity and should prompt further investigation. These associations are consistent with the factors that are correlated with relational continuity between patients and PCPs. Kristjansson and colleagues demonstrated that older patients and those with chronic disease reported higher relational continuity with their

PCPs, while those with higher education reported lower continuity.¹⁶ Other studies also have shown that patients with less education place higher value on continuity with their PCPs, particularly in outpatient settings.¹⁷ In contrast, the current analysis showed that patients with higher education level (higher than secondary) was also associated with patients' desire for continuity of care provided by their PCPs. One explanation is that patients with higher education feel more entitled to PCP contact while they are hospitalized, what is now optionally practiced by PCPs.

Some of the factors associated with patients' desire for PCP contact may be helpful in identifying patients who would be more satisfied with their inpatient care, likely influenced by the involvement of their PCPs. This information should inform policy decisions on how to best structure a program like the PCP Consultant Program. Further research should explore whether particular diagnoses, such as psychiatric or end of life issues, may identify patients who most prefer inpatient contact with their PCP.

Key Takeaways

- 77% of 199 interviewed patients with CHA-affiliated PCPs reported that the PCP involvement in inpatient care would be helpful
- Older patients (50 or older), higher education (more than 12 years of education), and higher PCP ratings were associated with patients valuing PCP involvement during hospitalization
- Factors associated with patients' valuation of PCP involvement can be used to identify patients who would most benefit from the PCP Consultant Program

¹⁶ Kristjansson EI, Hogg W, Dahrouge S, Tuna M, Mayo-Bruinsma L, Gebremichael G. Predictors of relational continuity in primary care: patient, provider and practice factors. *BMC Fam Pract*. 2013 May 31;14:72.

¹⁷ Nutting PA, Goodwin MA, Flocke SA, Zyzanski SJ, Stange KC. Continuity of primary care: To whom does it matter and when? *Ann Fam Med*. 2003 Sep; 1(3): 149–155.

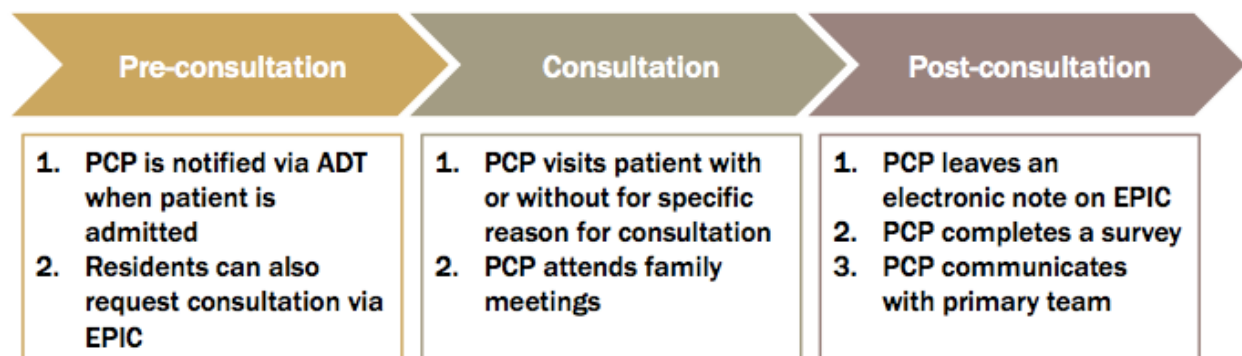
B. Process Evaluation: Perception of the Process of Involving PCP Consultants

Background

Process evaluation examines the implementation and operation of different components of the program. Conducting a process evaluation for the PCP Consult Program would help identify problems faced in the process and strategies for overcoming these obstacles. The entire process is divided into three phases: (1) pre-consultation, (2) consultation (PCP's visit to the patient), and (3) post-consultation. Each phase is comprised of a number of steps expected from either the PCP or the members of the inpatient team (Figure 1).

To assess the PCP consultation process thus far since the implementation of the program on January 1, 2015, three different perspectives were considered: (1) PCP consultants, (2) hospitalists, who are physicians-of-record for all hospitalized patients on the Medicine Service, and (3) residents, who are physicians-in-training at CHA, a teaching hospital that houses 190 residents and students every year.¹⁸

Figure 1: Expected consultation process for the PCP Consult Pilot Program



In the first section, PCPs perception of their new role as “consultants” was explored. In doing so, their perceived challenges to being effective informants and the values added to patient care were evaluated. The following section focused on understanding how hospitalists value PCPs’ participation in inpatient care as consultants. Different ways to improve PCPs’ incorporation into the hospitalists’ workflow were also explored. For a collaborative model to succeed, it is crucial to get buy-in from the inpatient team, including residents who are on the frontlines of providing care to patients at teaching hospitals like CHA.

Methods

Focus groups are ideal for exploring individual subjective experiences and attitudes towards new concepts. They are more effective than individual interviews in inducing real-world responses to questions, surveying an overview of attitudes and experiences, and exploring

¹⁸ About Cambridge Health Alliance, CHA FY14 Fact Sheet: <http://www.challiance.org/Resource.ashx?sn=CHA-Fact-Sheet>

consensus.^{19,20} Thus, this qualitative approach was selected to understand the attitudes of the PCP consultants, the hospitalists, and the residents about the process of the pilot program.

One moderator (author) guided the groups through a semi-structured focus group discussion that lasted approximately 30 min. Participant's anonymity was promised and maintained for the purpose of gathering honest feedback on the process of the pilot program. All sessions were audiotaped and transcribed. The moderator recorded transcribed responses to conduct data analysis. As described in the previous section, all responses from each of the focus groups were coded and thematically analyzed. Identified themes were grouped together and checked for consistency by the research assistants.

PCPs' perception of their involvement in inpatient care:

Seven months after the implementation of the pilot program, a focus group discussion was conducted with five of the seven PCP consultants participating in the program. In addition to the focus group, automatic, on-line surveys of all the PCP consultants were conducted at the completion of their consult visits from January 1st to May 23rd, 2015 (Appendix B), specifically asking about the consult process and the value added or subtracted to patient care. Descriptive analysis of the survey results was conducted.

Hospitalists' perception of PCP involvement in inpatient care:

Ten months after the initiation of the PCP Consultant Program, a focus group discussion was conducted with eight hospitalists at CHA. The semi-structured focus group interview guide was developed to explore the hospitalists' perception of PCP involvement thus far as consultants.

Residents' perception of PCP involvement in inpatient care:

10 months after the implementation of the pilot program, a focus group discussion was conducted with six of the 16 second- and third-year Internal Medicine residents. In addition, an on-line survey was conducted (response n=11, may include those who participated in the focus group) asking: (1) How does having a PCP consultant help with patient care? (2) What, if anything, is challenging about having the PCP give recommendations as a consultant for inpatients?

Guiding Questions for Hospitalist Group Discussion and Resident Focus Group Discussion

1. Can you share your stories/vignettes of working with PCP consultants? How have they added (or subtracted) value to patient care?
2. What are some logistical benefits or challenges to co-managing patients with PCP consultants?
3. What are your ideals for involving PCP consultants in in-patient care? In other words, how can we best integrate PCP consultants into in-patient workflow to improve patient care?

¹⁹ Kitinger, J. Qualitative research. Introducing focus groups. BMJ 1995, 311, 299-302.

²⁰ Twohig, P.L.; Putnam, W. Group interviews in primary care research: Advancing the state of the art or ritualized research? Fam. Pract. 2002, 19, 278-284.

Results

PCPs' perception of their involvement in inpatient care:

101 automatic, on-line surveys were completed by the PCP consultants between January 1st and May 23rd, 2015. PCP consultants felt that the majority (81%) of the consultations went “okay” to “excellent.” The majority of the PCP consultants felt that they provided comfort to their patients based on their previous relationships, provided pertinent information to the inpatient team, and facilitated discharge planning and coordination of care post discharge.

- **81%** thought the consultation process went “okay” to “excellent”
- **74%** thought they **provided comfort to the patient** based on their previous relationship
- **76%** thought they **provided information to the house officers** about the patient’s medical issues that they had not known
- **53%** thought they **facilitated discharge planning and coordination of care** post discharge
- 25% thought they expedited discharge vs. 8% thought they delayed discharge

They reported contributing to the care of their hospitalized patients by: providing medical or social information, suggesting medical management, supporting transition of care, facilitating end-of-life discussions, and providing comfort to patients and family members (Table 3).

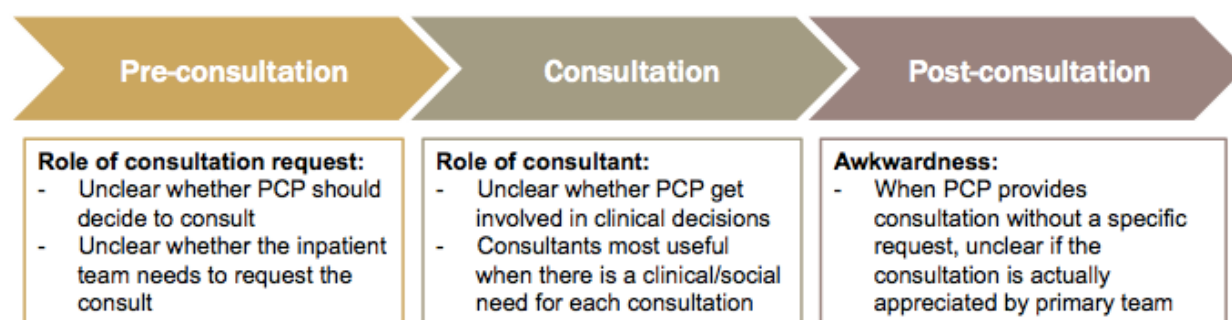
Table 3: Perceived Contributions by PCP Consultants

Themes	Examples
PCP provided medical or social information	• Shared knowledge of her baseline mental status • Gave background on complex social situation • Described home situation and lack of supports
PCP supported patient management	• Performed a neurological exam which patient had not cooperated in with hospital team • Medical team had difficulties with patient around communication issues
PCP made suggestions for medical management	• Suggested importance of brain imaging to better understand his cognitive impairment • Suggested lab follow-up of leukocytosis
PCP facilitated patient's decision making process	• "Patient asked to speak to PCP to help make decision • Communicated with hospitalist about care goals • Discussed need for local surgical therapy • Defined end of life plan
PCP supported transition of care	• Called nursing home on discharge to assure smooth transition • Contacted Complex Care Manager about preventing re-admissions • Facilitated connection to SNF where PCP will follow the patient
PCP provided comfort to patient	• Provided support and comfort to patient before being intubated
PCP interacted with family members	• Met with family and reassured them that PCP would see patient at rehab • Supported family members • Attended family meeting
PCP could not be involved	• No one called me. I think it would have been helpful to share my knowledge of this patient who has difficulties with med adherence. • Brief admission. • This was an ED visit, so probably shouldn't be counted • I was not involved in this admission due to weather

The PCP consultants participating in the focus group also identified the areas of improvement in the consult process as outlined in Figure 2. In the pre-consultation process, it was unclear to both the PCP consultants and the inpatient providers whose responsibility it was to initiate the consultation. The PCP consultants felt that the medical and social need for a consultation is often best discerned by PCPs themselves, not the primary team. However, when the PCPs initiated the consultation process without a request from the inpatient team, they felt "awkward" for it was unclear whether their advice would be appreciated. During the consultation process, the "advisory role" became vague especially when PCPs wanted to provide clinical recommendations. As PCPs who have built longitudinal relationships with

their patients, the consultants would provide clinical recommendations that were relevant more to outpatient than inpatient management. For this reason, some of the PCPs felt that the term “consultant” did not fit their role. They felt that due to their ongoing relationship with the patient, that the ways that they added value were, therefore, fundamentally different from those of a consultant.

Figure 2: Areas of improvement in the consultation process, as identified by the PCP consultants



Hospitalists' perception of their involvement in inpatient care:

The hospitalists participating in the focus group expressed their appreciation for PCP involvement in inpatient care. When describing the areas of improvement in the current

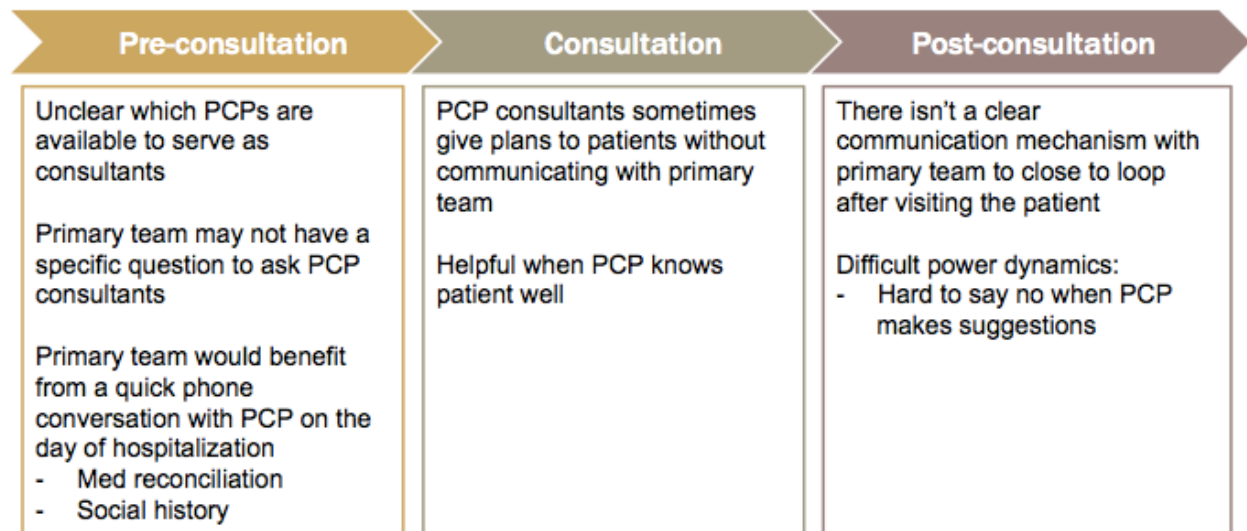
consultation process (Figure 3), the hospitalists also brought up the lack of clarity in regards to initiating the consultation. First of all, not all PCPs in the CHA network serve as consultants, which requires the inpatient providers to remember the seven PCPs participating in the pilot program. As discussed in the focus group with the PCP consultants, the medical and social need for a

“100% of patients at CHA would benefit from having their PCPs involved. Patients often express dissatisfaction when their PCPs don’t come to see them.”

- A hospitalist in the focus group

consultation is often best discerned by PCPs themselves, not the primary team. Therefore, not all inpatient providers can think of a specific question to initiate a consultation. When there is a specific question (i.e. regarding medication reconciliation and social history), the hospitalists felt that it would be sufficient to have a quick conversation with the PCPs in the early phase of the patient’s hospitalization. The hospitalists also identified the need for a clear communication mechanism for PCP consultants to close the loop after inpatient visits. Hospitalists also found it difficult to reject PCP consultants’ medical recommendations.

Figure 3: Areas of improvement in the consultation process, as identified by the hospitalists

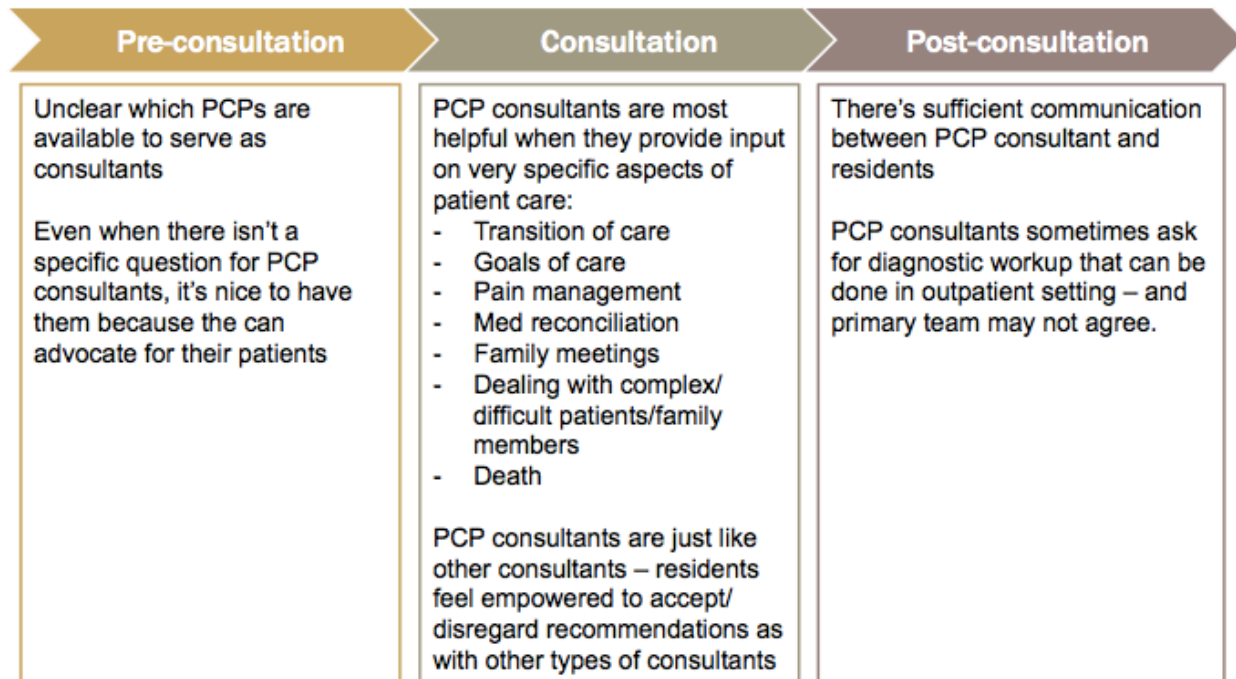


Residents' perception of their involvement in inpatient care:

The residents have found the PCP consultants mainly helpful, especially when the consults are based on long, meaningful relationships with patients. The residents reported that the PCP consultants have facilitated family meetings, goals of care discussions, and coordination of post-discharge care. Unlike the hospitalists, the residents felt that it was helpful to have the PCPs involved as consultants even when there is not a specific question for patient care.

When identifying the specific areas of improvement in the consultation process (Figure 4), the residents, like the hospitalists, mentioned how it can be difficult to remember which PCPs are participating in the pilot program and to remind themselves to reach out the consultants when specific questions arise. The residents also did not find the process of communicating with PCP consultants problematic, but did note that PCPs occasionally recommended additional, non-urgent inpatient evaluations or tests.

Figure 4: Areas of improvement in the consultation process, as identified by the residents



Discussion

The “PCP consult” provides a model for PCP involvement that residents view as contributing to care and that may allow effective modeling of the value of long-term patient-doctor relationships. However, the focus group sessions with the stakeholders involved in the consultation process revealed that a number of areas of improvement.

The hospitalists and the residents in the focus group sessions found PCP involvement important and useful, particularly in providing emotional support to patients, but found a number of obstacles, including difficulty in ensuring communication with the team and some concerns about ensuring defined responsibilities in inpatient settings.

Meanwhile, PCP consultants identified some of the obstacles that suggested that they were still referring back to their previous role as physicians-of-record, prior to the hospital's transition to the hospitalist model of inpatient care. PCPs, whose responsibility is to provide longitudinal care, may feel that they have the expertise to know when to initiate the consultation process and to provide recommendations that may not be relevant to the acute issue at hand, which the focus of the inpatient team. The discordant perceptions of PCP consultant's role may result in difficult power dynamics, as described by the hospitalists.

If the PCP's role is to be a “consultant,” which by definition is to provide recommendations that are subject to rejection by the primary team, there should be a clear, well-defined “areas of expertise” for PCP consultants. These areas of expertise should focus on the specific aspects of patient care, such as those identified by the residents, and PCPs must agree to limit the scope of their recommendations to their defined areas of expertise.

Key Takeaways

- **Pre-Consultation:** Need to clarify the process for initiating a consultation (who should initiate, whom to contact, and how to initiate)
- **Consultation:** Need to define “areas of expertise” of PCP consultants to ensure clear lines of responsibilities in inpatient settings
- **Post-Consultation:** Need to structure a communication pathway for PCP consultants to relay their recommendations to the inpatient providers

C. Outcome Evaluation: Impacts of Care Provided by PCP Consultants

Background

Hospital readmission rates, or the proportion of discharged patients for whom rapid re-hospitalization occurs (typically within 30 days), has become a leading topic of healthcare policy. This is due to the fact that high readmission rates can be a sign of low quality healthcare, a metric now used nationally to gauge quality of care. Medicare imposes financial penalties on hospitals with a high rate of readmissions. Hospital readmissions remain frequent, expensive, and largely preventable.²¹ Improving readmission rates represents an opportunity to simultaneously increase quality of care while decreasing cost.²²

Utilization of emergency departments (EDs) for non-emergency care is considered another quality measure for healthcare networks like CHA. Although controversial, non-emergent ER visits are seen as inefficient use of the healthcare system that drives up the cost of medical care. A well-functioning healthcare network is to direct its patients to primary care physicians for non-acute care, which would then improve the quality of care and reduce the cost of care.

In this section, impact evaluation was conducted to examine whether the PCP Consultant Program had an intended effect on improving patient outcomes, including readmission rates and total ED visits. To do so, the analysis compares two groups: seven PCP consultants in the pilot program and six PCPs who practice at the same clinics as the consultants. Furthermore, patient outcomes from two distinct time periods (years 2014 and 2015) are examined to see the impact of the pilot program, which was implemented on January 1, 2015.

Methods

CHA's inpatient admission database and ED admission database from January 1, 2014, through December 31, 2015 were used to determine whether the PCP Consultant Program was associated with improved patient outcomes (readmission rates and ED admission). Difference-in-difference analysis was conducted compare changes in readmission rates and ED admissions among PCP consultants before and after the implementation of the pilot program (Year 2014 vs. 2015) to changes among outpatient clinic-matched PCPs not participating in the program. Table 4 describes in detail how the difference-in-difference analysis was designed. Further analysis examined whether effects on readmission rates varied according to patients' age, gender, and preferred language.

²¹ van Walraven C, Bennett C, Jennings A, Austin PC, Forster AJ. Proportion of hospital readmissions deemed avoidable: a systematic review. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne* 2011;183:E391-402.

²² Joynt KE, Orav EJ, Jha AK. Thirty-day readmission rates for Medicare beneficiaries by race and site of care. *Jama* 2011;305:675-81.

Table 4: Design of the difference-in-difference analysis

	Treatment Group	Control Group
1/1/2014 - 12/31/2014 Pre-implementation	4 PCU- and 3 Windsor-based PCPs serving as physicians-of-record	3 PCU- and 3 Windsor-based PCPs
1/1/2015 - 12/31/2015 Post-implementation	4 PCU- and 3 Windsor-based PCPs serving as consultants	3 PCU- and 3 Windsor-based PCPs

Results

On average, PCP consultants had a readmission rate of 17.7% in 2014. Their counterparts had an average readmission rate of 17.8%. Although both groups had similar readmission rates before the implementation of the PCP Consultant Program, the average readmission rate for the non-consultants rose up to 22.9% in 2015, compared to 17.3% for the PCP consultants (Figure 5). There was a 5% decrease in the average readmission rate for the PCP consultants, compared to their counterparts, after the program was implemented on January 1, 2015 (Table 5). Adding other explanatory variables to the model did not significantly impact the difference-in-difference estimator (Table 6). Nonetheless, patients whose primary language is not English appear to have a 7.9% decrease in the likelihood of being readmitted ($p < 0.05$).

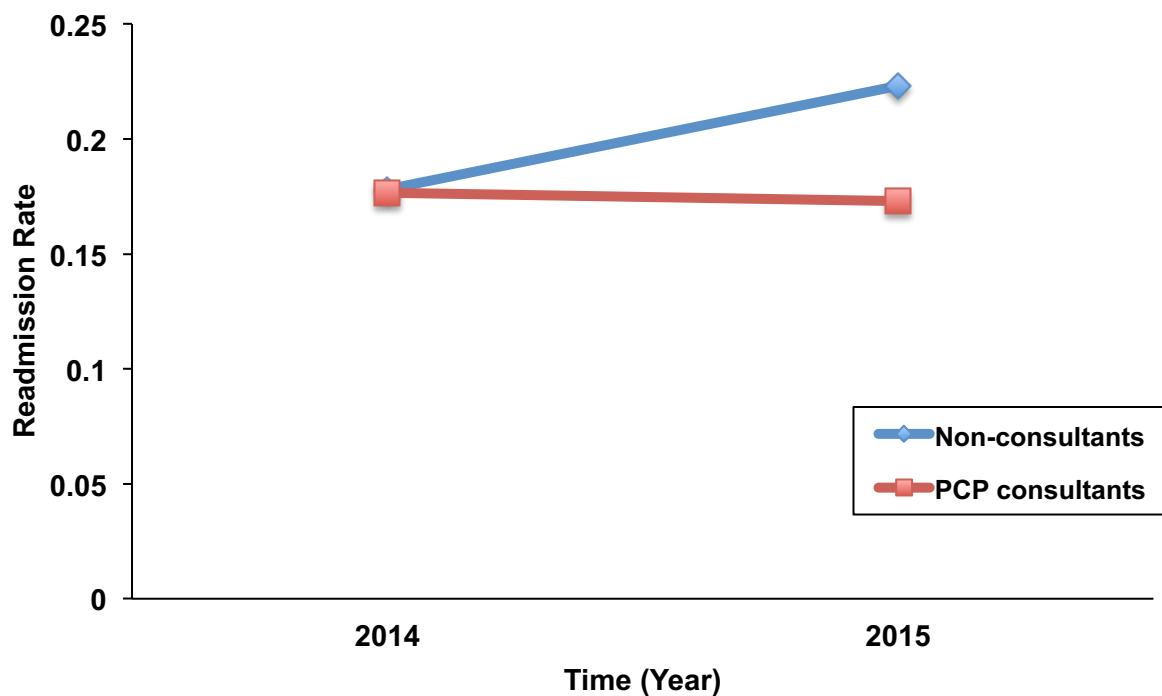


Figure 5: Average readmission rates of PCP consultants and non-consultants, compared over time. Year 2014: pre-implementation, Year 2015: post-implementation.

Table 5: Difference-in-difference analysis describing the relationship between readmission rates of PCP consultants and non-consultants, across two time periods.

	2014	2015	Time difference w/ in group
PCP consultants	0.177 (0.014)	0.173 (.015)	-0.004 (0.021)
Other PCPs	0.178 (0.018)	0.229 (0.020)	0.050 (0.027)
Group difference at a point in time	0.001 (0.023)	0.056 (0.025)	-0.054 (0.034)

Table 6: Difference-in-difference analysis describing the relationship between readmission rates and various explanatory variables

	Readmission Rate			
PCP Consultant	-0.001 (0.023)	-0.001 (0.024)	-0.002 (0.024)	0.001 (0.024)
2015	0.050 (0.027)**	0.051 (0.027)**	0.050 (0.027)**	0.047 (0.027)**
PCP Consultant * 2015	-0.054 (0.034)*	-0.054 (0.034)*	-0.054 (0.034)*	-0.051 (0.034)*
Age		-0.00001 (0.0005)	0.0002 (0.001)	0.0003 (0.0005)
Female			-0.012 (0.017)	-0.008 (0.017)
Native language is not English				-0.079 (0.017)***
_cons	0.178 (0.018)	0.179 (0.031)	0.184 (0.033)	0.191 (0.033)
R²	0.0031	0.0031	0.0033	0.0120
N	2185	2185	2185	2185

*p<0.15, **p<0.10, ***p<0.05

On average, PCP consultants had an average of 119 ED admissions in 2014 (Table 7). Their counterparts had an average of 131 ED admissions in 2014. Both groups had a decrease in ED admissions in 2015: 102 patients per physician or the PCP consultants and 106 patients per physician for the non-consultants (Figure 6). As summarized in Table 7, the non-consultants' average number ED admissions per PCP decreased over time by 7.7 patients more than the PCP-consultants' average number of ED admissions per PCP decreased over time. This difference-in-difference estimator was not statistically significant ($p=0.79$).

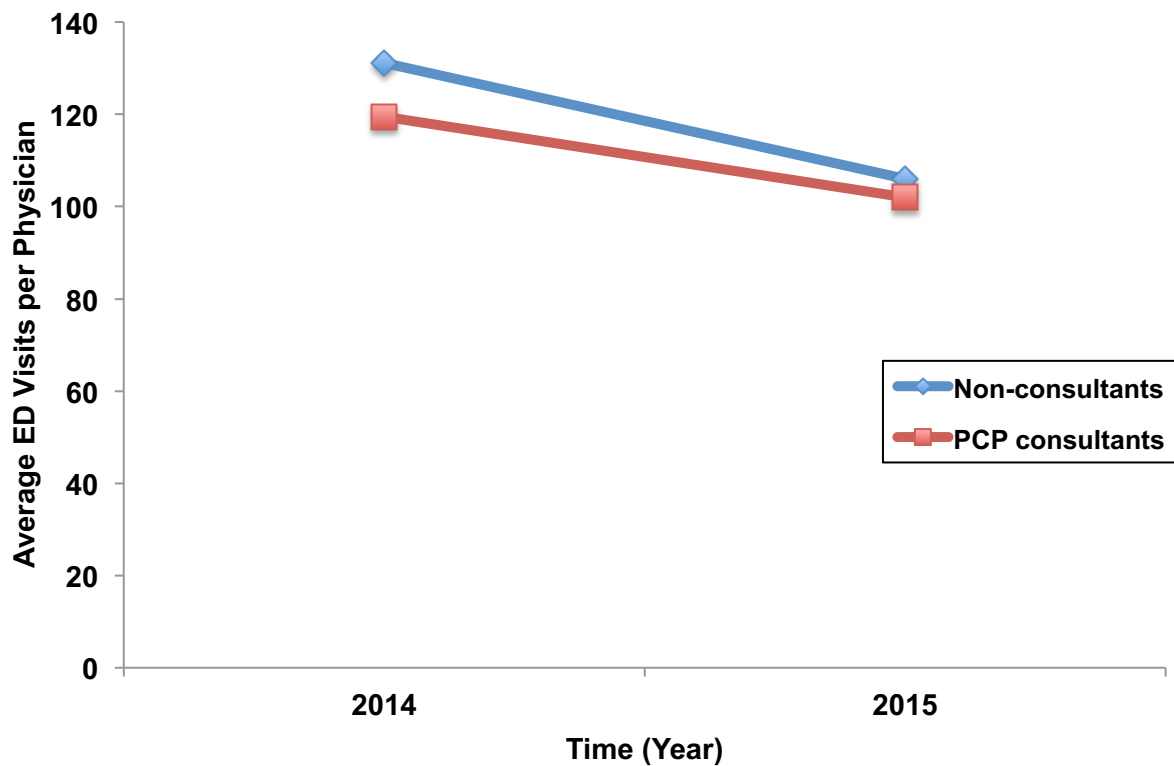


Figure 6: Average number of ED visits per physician, compared between PCP consultants and non-consultants, before the implementation of the pilot program (2014) and after (2015).

Table 7: Difference-in-difference analysis describing the relationship between average number of ED admissions per PCP, across two time periods.

	2014	2015	Time difference w/ in group
PCP consultants	119.43 (19.52)	102.00 (10.96)	-17.43 (23.87)
Other PCPs	131.17 (11.74)	106.00 (13.73)	-25.17 (16.06)
Group difference at a point in time	11.74 (23.81)	4.00 (18.01)	7.74 (28.83)

Discussion

The difference-in-difference analysis revealed that the non-consultants' average readmission rate increased over time by 5% more than the PCP consultants' average readmission rate over time. This difference-in-difference estimator was not statistically significant ($p=0.11$), but it suggests that the PCP Pilot Program may have contributed to keeping the readmission rates low for the PCP consultants while the readmission rates for the non-consultants increased in 2015. This finding is consistent with the proposed impact of the PCP Consultant Program, in which the consultants provide continuity of care by facilitating and coordinating post-discharge care.

Controlling for some of the available variables in the dataset, including age, gender, and primary language, in the regression model did not significantly change the difference-in-difference estimator in change readmission rates. This suggests that the difference in the average readmission rates still remains independent of the variables included in the analysis. However, severity of illness, which may have affected the readmission rates (i.e. non-consultants had a disproportionately higher number of severely ill patients, who are more likely to be readmitted), was not included in the current analysis.

The non-consultants' average number ED admissions per PCP decreased over time by 7.7 patients more than the PCP-consultants' average number of ED admissions per PCP decreased over time. This difference-in-difference estimator was not statistically significant ($p=0.79$). Other possibly influential variables were not factored into this regression model for predicting the number of ED admissions. It is also important to note that reducing the number of non-emergent ED visits is prioritized over reducing the total number of ED visits. The current analysis could not distinguish non-emergent ED visits from those that required emergent attention in the ED.

Another limitation of the current analyses is that the control group (non-consultants) is an imperfect match for the treatment group (PCP consultants) for comparison of patient outcomes. Anecdotally, the PCP consultants have sicker patient panels that may have clinical outcomes that are different from the non-consultants' patient panels. Further studies should include severity of illness as a variable in the regression analysis. Moreover, a logistical assessment of the clinical outcomes of the patients seen by the PCP consultants compared to the non-consultants may yield a stronger analysis of the impact of the pilot program.

Key Takeaways

- The non-consultants' average readmission rate increased over time by 5% more than the PCP consultants' average readmission rate over time ($p=0.11$)
- The non-consultants' average number ED admissions per PCP decreased over time by 7.7 patients more than the PCP-consultants' average number of ED admissions per PCP decreased over time ($p=0.78$)

D. Feasibility Assessment: Cost of Care Provided by PCP Consultants

Background

Cost analyses provide an important insight into the overall cost of implementing a program, costs for specific program components, and costs per program participants.²³ Costs are defined as the monetary value of the resources used to implement and sustain a program, not just the money spent. Cost analyses also establish a foundation for other types of economic analysis, such as cost-effective or cost-benefit analyses.

In this section, the cost of the PCP Consultant Program for the seven participating PCPs is estimated using the billing data from the first six months of the pilot program. To test the feasibility of either sustaining the current pilot program or expanding the program, the monetary value of the reimbursement was examined. The perspective of the cost analysis conducted in this section was defined as the Cambridge Health Alliance (CHA), which would reimburse its PCP consultants until a third-party payer, such as an insurance company or Medicare, shares the cost of providing continuity visits.

It is important to establish a value not only for how much the reimbursing organization would need to pay the PCP consultants for their billed services, but also for the program's use of resources at no cost. For example, the time that a PCP consultant spends making a continuity visit might otherwise be spent in the clinic to see a number of outpatients. In this analysis, however, it was assumed that the PCPs knew the financial tradeoffs of their time spent as consultants for their hospitalized patients.

After determining the cost of the PCP Consultant Program, the overcall cost of expanding the pilot program will be estimated to inform the client of the overall budget. This information will be used to determine whether the cost of the expansion can be justified by the benefits as described in the previous sections.

Methodology

All PCP consultants were asked to bill their consult services since January 1st, 2015. For the purpose of the cost analysis, billing data were collected for first six months of the pilot program, from January 1st to June 30th, 2015. For each PCP consultant's billed visit, the following data were collected: (1) patient name, (2) diagnosis, and (3) relative value units (RVUs), which are a measure of value used in the United States Medicare reimbursement formula for physician services. All data collected were de-identified before the analysis.

²³ Yates, B.T. (2009). Cost-inclusive evaluation: A banquet of approaches for including costs, benefits, and cost-effectiveness and cost-benefit analyses in your next evaluation. *Evaluation and Program Planning*, 32(1), 52-54. Retrieved from http://brianyates.net/info/yates_banquet_of_approaches.pdf.

Results

From January 1st to June 30th, 2015, 118 claims were billed by the PCP consultants for a total of 94 patients. PCP consultants provided services to patients with complex conditions (Figure 7). One out of seven PCP consultants did not bill for her services; it was confirmed that this PCP provided multiple consult services during the above time frame, but she did not submit billing forms for reimbursement.

Figure 7: Sample primary diagnoses by ICD-9 codes for patients seen by PCP consultants

- Cerebral artery occlusion
- TIA
- COPD with acute exacerbation
- Acute kidney failure
- End state renal disease
- MS
- Psychiatric illnesses: schizophrenia, depressive DO, amnestic DO
- Substance abuse: alcohol withdrawal
- Hemorrhagic GI tract
- Cardiomyopathies
- Pneumonia
- Dissection of aortic aneurysm
- Complications of HIV: cellulitis, abscess
- Afib
- Hypoclycemia, volume depletion
- Encounter for palliative care
- UTI

Excluding the one PCP who did not bill for any consult visit, the six PCPs, on average, provided consult service to 2.6 patients and billed 3.3 claims per month. For every fourth patient, each PCP submitted two claims on average. As shown in Table 8, there is a wide variation in the number of claims submitted by the PCPs. This variation appears to correlate with the PCP's clinic site: the four PCPs, whose clinic is based at the hospital (Primary Care Unit – "PCU") visited 35% of their hospitalized patients on average, while the three PCPs, whose clinic is one mile away from the hospital, visited 11% of their hospitalized patients on average.

A variation in RVU per patient among the PCPs was also noted. The average RVU per patient was 3.39, the average RVU per claim 2.70. RVU can be translated into a monetary value, based on the conversion factor (CF) determined by the reimbursing agent. In this case, CHA, the reimbursing agent, is to set the CF for the PCP's services. For the current cost analysis, the standard CF (\$35.8279) for Medicaid reimbursement set by the Centers for Medicare & Medicaid Services for 2016 was used to estimate the yearly cost of the program.²⁴ The estimated cost of the pilot program, consisting of 6 PCP consultants who billed for their services, is \$22,836 per year.

²⁴ <http://www.healthindustrywashingtonwatch.com/2015/11/articles/regulatory-developments/medicare-medicaid-services-regulations/cms-finalizes-medicare-physician-fee-schedule-rates-policies-for-2016/>

Table 8: Summary of billing data for each of the PCP consultants from January 1st to June 30th, 2015

	# of patients claimed	% of admitted patients claimed	# of claims	Total RVU	RVU/patient
PCP #1*	22	35% (22/63)	31	81.04	3.68
PCP #2	2	8% (2/25)	2	2.78	1.39
PCP #3	5	12% (5/41)	9	19.17	3.83
PCP #4*	20	34% (20/59)	20	61.16	3.06
PCP #5*	41	49% (41/84)	51	146.40	3.57
PCP #6*	4	9% (4/43)	5	8.14	2.04
PCP #7	0	0% (0/28)	0	0	0
TOTAL	94	30%	118	318.69	3.39

*PCPs whose clinic is based at the Primary Care Unit (PCU), located in the Cambridge Hospital where patients are hospitalized.

Table 9: Assumptions for estimating the cost of expanding the PCP Consult Program

Assumptions	Sources
Each year, 4620 patients are hospitalized to the Medicine Service at the two CHA hospitals (includes Family Medicine)	Admission data from 2/12/2015 – 2/12/2016
Approximately 75% of the hospitalized patients have PCPs affiliated with CHA (both Internal Medicine and Family Medicine)	Dr. David Bor, Chief of Medicine
650 patients, whose PCPs are based at the Primary Care Unit (PCU), are admitted to the Medicine Service at the CHA Cambridge Hospital each year	Admission data from 1/1/2015-12/31/2015
PCPs based at PCU visit 35% of their hospitalized patients	Billing data submitted by PCU-based PCP consultants from 1/1/2015-6/30/2015
PCPs based at other community clinics visit 11% of their hospitalized patients	Billing data submitted by Windsor-based PCP consultants from 1/1/2015-6/30/2015
Each patient seen by PCP consultant is billed for \$121	Billing data submitted by PCP consultants from 1/12015-6/30/2015

To estimate the cost of expanding the program to include all 100 PCPs affiliated with CHA consultants, various assumptions were made as summarized in Table 9. Although 30% of PCP consultants' hospitalized patients were visited and billed on average, this figure was not used to estimate the overall "consult rate" of all CHA-affiliated PCPs who would be participating in the expanded program. As discussed previously, the average consult rate of the PCPs at the PCU was 35%, compared to the 11% consult rate of the PCPs at Windsor. This practice difference is likely related to the location of the PCU, which makes it more convenient for the PCU-based PCPs to visit their hospitalized patients than for the other PCPs. Based on these assumptions, the total number of patients (on both Medicine and Family Medicine Services at the two CHA hospitals), who would receive a continuity visit, was estimated to be 538 per year.

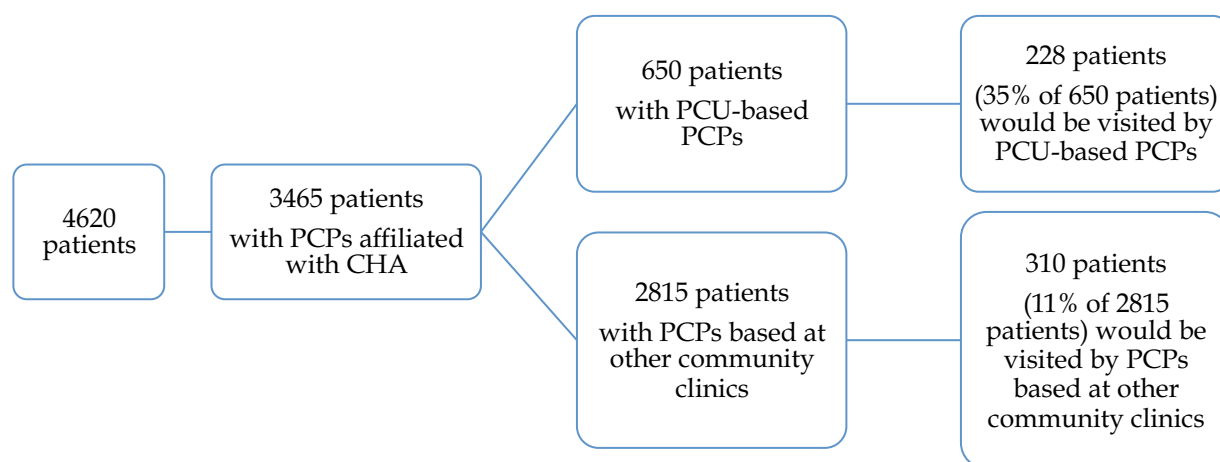


Figure 8: Estimation of the total number of likely PCP consultations per year with the expansion of the PCP Consult Program.

For each hospitalized patient seen by the PCP consultant, the average amount of money reimbursed was \$121, which may change with the number of claims per patient and the complexity of the services provided by the consultant (Table 10). Based on these figures, the estimated cost of expanding the program to include approximately 100 full-time PCPs in the CHA network is \$65,098 per year, if all the assumptions hold true.

Table 10: Estimated cost for the pilot program and for the expansion of the program

Per year for the pilot program*	\$22836
Per each hospitalized patient	\$121
Per year for all CHA-affiliated PCPs**	\$65,098

*6 PCP consultants in the pilot program (excluding one PCP who did not bill for consult services)

**If expansion were to include approximately 100 full-time PCPs affiliated with CHA

Discussion

The cost analysis conducted from the perspective of CHA, the reimbursing agent, was based on the data collected from the first six months of the pilot program, which was driven by seven PCPs invested in making continuity visits to their hospitalized patients. It is important to note that the approximated annual cost of \$65,098 for expanding the program to include 100 CHA-affiliated PCPs is founded on various estimations (Table 11). These values may be overestimated, as justified in Table 11, resulting in an overall overestimation of the annual cost of reimbursing 100 PCPs for their consult services. Moreover, not all PCPs may bill for their consult work, as happened in the pilot study. Billing omission would also result in an actual cost that is less than the estimated cost of \$65,098.

Other factors that would influence the overall cost of expanding the program may include the distance between the clinic and the hospital, the weather, the willingness of the participating PCPs, and the actual CF determined by the reimbursing agent. Although omitted in this analysis, it would be important to analyze the demographics of the patients visited by the PCP consultants, who billed for their services. Further analysis should explore whether particular demographics may identify patients who would most benefit from PCP consultation.

Table 11: Likely directions of the estimations made in the cost analysis

Estimations	Over- or Under-estimation	Reasons
PCPs based at other community clinics visit 11% of their hospitalized patients	Overestimation	The 11% consult rate is based on the PCPs at Windsor, which is only one mile away from the hospital. Other clinics are located farther from the hospitals.
All 100 PCPs willingly participates in the program, if expanded	Overestimation	Higher proportion of CHA-affiliated PCPs whose clinics are not based at one of the participating hospitals – making it difficult for them to visit their patients
Each patient seen by PCP consultant is billed for \$121	Overestimation	- Conversion factor set by CF is likely to be lower than the Medicaid CF used for this cost analysis - Not every PCP will bill for their consult services

Key Takeaways

- Per year cost of the pilot program with six PCPs: \$22836
- Per year cost of expanding the program to include all 100 CHA-affiliated PCPs: \$65,098, which may be an overestimation

Criteria & Policy Analysis

In previous sections, program evaluation was conducted in four steps: (1) need assessment, (2) process evaluation, (3) outcome evaluation, and (4) feasibility assessment. Parallel to these stages, four criteria were created:

Policy Analysis Criteria

1. **Patient Satisfaction:** Patients desire PCP involvement
2. **Operational feasibility:** Consultation process is clear and well practiced by PCPs, hospitalists, and residents
3. **Impact on patient outcomes:** PCP consultants improve patient outcomes
4. **Financial feasibility:** PCP consultants can be reimbursed for their services

These criteria were used to analyze the three policy options:

Policy Options

- **Option A, “Expansion”:** Expand the pilot program to include all CHA-affiliated PCPs, thereby allowing them to provide formal consult services for their patients on the medicine wards at the CHA hospitals. They will be reimbursed appropriately for their services.
- **Option B “Continuation”:** Do not expand the pilot program, but continue it while incorporating the recommendations to improve the consultation process.
- **Option C “Discontinuation”:** Discontinue the pilot program.

To predict the outcomes, several assumptions were made as described in Table 12. Based on these assumptions, an outcome matrix was created to compare the three policy options across the four selected criteria (Table 13).

Table 12: Likely directions of the estimations made in the policy analysis

Assumptions	Explanations
77% of the patients whose PCPs are involved in their inpatient care would appreciate the consultation	<i>Underestimation:</i> Patients who has had PCP involvement in the past are more likely to appreciate the consultation
All patients who prefer PCP involvement would report higher patient satisfaction after the consultation	<i>Overestimation:</i> Not all PCP consultations would translate into favorable inpatient experience
538 patients would be seen by PCP consultants each year	<i>Overestimation:</i> Unclear whether all PCPs would serve as consultants
PCP consultants would be paid at the rate of the standard Medicare conversion factor (\$35.8279)	<i>Overestimation:</i> Unclear what CHA or other potential reimbursing agents would agree to pay per RVU

Table 13: Outcome Matrix for three policy options compared across the four selected criteria

	Option A: Expansion	Option B: Continuation	Option C: Discontinuation
Patient Satisfaction	- Approximately 538 patients will be seen by PCPs affiliated with CHA 414 patients are likely to report higher satisfaction with their inpatient experience (9% of all hospitalized patients)	- Approximately 190 patients will be seen by the cohort of seven PCP consultants 146 patients are likely to report higher satisfaction with their inpatient experience (3% of all hospitalized patients)	Baseline patient satisfaction level
Operational Feasibility	- All 100 PCPs need to be trained to fulfill their responsibilities as consultants - All 100 PCPs must be trained to follow the consultation procedure - All hospitalists and residents at both CHA Cambridge and Whidden Hospitals need to be reminded of the consultation process – and notified that they will be expecting more PCPs to be involved in inpatient care	7 PCP consultants need to be trained to fulfill the responsibilities agreed upon - All hospitalists and residents at CHA Cambridge Hospital must be reminded which PCPs are available to serve as consultants - All hospitalists and residents at CHA Cambridge Hospital need to be reminded of the consultation process (setting expectations)	- Discontinue the current program - The current cohort of seven PCPs may continue to be involved in providing informal, uncompensated consultation
Patient Outcomes	5% decrease in the overall admission rate for all PCPs	5% decrease in the average readmission rate for the current cohort of 7 PCP consultants (who comprise 7% of all PCPs at CHA)	Baseline readmission rate
Financial Feasibility	\$65,000 per year for approximately 100 CHA-affiliated PCPs from both the Department of Medicine and the Department of Family Medicine)	\$25,000 per year for the current cohort of seven PCPs	No cost to CHA

The option of expanding the program (Option A) is predicted to have the greatest impact (increased patient satisfaction and decreased readmission rate), when applied to all PCPs who would be eligible to participate in the program as consultants. However, there are uncertainties embedded in these predictions (Table 14). Of these uncertainties, the following four uncertainties warrant further investigation before expanding the program.

1. **PCPs' willingness to participate in the program:** Without PCPs' buy-in, the program would not succeed in produce the positive results as predicted.
2. **Resources for process implementation:** It is unclear whether there are enough resources to train PCPs, hospitalists, and residents at two CHA hospitals. The training process would entail a gradual culture change that accepts PCPs as valuable consultants. Moreover, a robust, well-structured training is needed to re-educate the participants of the program of the ideal role of PCP consultants and the consultation process.
3. **Patient outcomes related to the program:** Although readmission rates are predicted to decrease, it is unclear whether patients who receive consultation are specifically less likely to be readmitted. Meanwhile, other "unintended consequences" may affect the practice patterns of PCP consultants, who may feel pressured to see their hospitalized patients and spend more time away from their clinic patients.
4. **Reimbursement:** Although the expansion is predicted to cost \$65,000 per year, it is unclear whether CHA would be committed to reimbursing all PCP consultants and whether this reimbursement structure would be sustainable.

Table 14: Uncertainties that are embedded in the predicted outcomes and feasibility of expanding the pilot program

	Uncertainties
Patient Satisfaction	• Patients desire PCP involvement in their inpatient care • The expanded program has the potential to improve patients' satisfaction level • PCPs in the CHA network are willing to provide consult services in the expanded program
Operational Feasibility	• PCPs, hospitalists, and residents understand the role of PCP consultants • All participating members understand and practice the standardized consultation process (pre-consultation, consultation, and post-consultation)
Patient Outcomes	• The expanded program improves patient outcomes (not limited to readmission rates and ED visits) • Improved outcomes reduce healthcare costs
Financial Feasibility	• Billing information can be recorded for all PCPs participating in the expanded program • CHA is willing to reimburse all PCPs for their consult services (~\$65,000/year)

*In red are uncertainties that warrant further investigation before the expansion

The predicted positive outcomes may not be realized or sustained in an expanded program. If the program is expanded without assessing the PCPs' willingness to participate in the program, securing the resources for implementing the program, examining the impact on patient outcomes, and identifying a stable reimbursement structure, the program may face an abrupt end.

The option of continuing the pilot program (Option B) is more viable, especially given the financial commitment from CHA. Although the pilot program's predicted impact on patient satisfaction and patient outcomes are marginal (4% of all patients admitted to the Medicine Service), it offers other benefits, such as: (1) creating a culture that values primary care, and (2) training young physicians to interface with primary care providers more frequently, especially in the CHA Internal Medicine Residency Program, which is well known for its strong training in primary care. Lastly, some of the operational challenges have already been identified in the current analysis, which can be used to improve and refine the pilot program. In the following section, the final policy recommendation will be presented along with a series of concrete steps to improve the current program.

Recommendations

Final Recommendation

CHA should not expand the pilot PCP Consultant Program. However, the pilot program should be continued for another calendar year while the recommendations to improve the consultation process are incorporated.

Next Steps for Process Improvement

The specific recommendations for each of the three phases of the consultation process are described in Figure 9. Of these recommendations, four most important ones are detailed below:

1. Define role of the PCP consultant:

- a. **Problem:** Currently, there is no consensus in regards to the role of the PCP consultant. As the inpatient care system transitioned to the hospitalist model in January 2015, the PCPs, who had been the physicians-of-record, have found themselves with significantly diminished involvement in the care of their hospitalized patients. However, with these PCPs serving as consultants, their role on the wards became unclear even with their new title as “consultants.”
- b. **Suggestions:** PCP consultants’ role should be to provide expertise in medical and social areas of patient care based on their long, meaningful relationships with their patients. PCP consultants should be tasked to visit once or twice during a patient’s hospitalization, providing care the PCP considers relevant, which may include a focused exam, insight into prior care, emotional support based upon a long-term care relationship, discussion of care decisions with the patient and family, and assistance in planning after-hospital care. After concisely documenting the findings, PCP consultants should communicate their recommendations to the inpatient team. This clear definition of the PCP consultant’s role must be shared with all participants of the program.

2. Define the PCP consultant’s scope of recommendations:

- a. **Problem:** PCPs may make recommendations that are more relevant to the outpatient management of the patient’s medical problems and less relevant to the acute management that requires hospitalization. Although prioritizing the acute medical issues is important, PCPs’ recommendations may also be important for the patient’s health longitudinally.
- b. **Suggestions:** PCP consultants and hospitalists need to agree on the scope of recommendations that are appropriate for inpatient PCP consultation. Suggested types of recommendations include: transition of care, goals of care, pain management, medication reconciliation, facilitation of family meetings, and collaboration with complex patients and family members. A focus group with both the participating PCPs and the hospitalists would be the first step to reaching a mutual agreement. Moreover, PCPs should be aware that their recommendations are subject to rejection, just as other specialty consultants’ recommendations would be considered by the inpatient team.

3. **Allow team-based agenda setting:**
 - a. **Problem:** The inpatient team is responsible for setting the care agenda for all hospitalized patients. However, the PCP consultant also has a vested interest in shaping the agenda as the patient's long-term provider.
 - b. **Suggestions:** Before visiting their hospitalized patients, PCP consultants should discuss with the inpatient team to understand and contribute to the care agenda for their patients. PCP consultants' recommendations and contributions should focus on achieving the team agenda.
4. **Standardize communication and closing the loop:**
 - a. **Problem:** PCP consultants are required to leave an electronic note, documenting each visit, but the quality of these notes varies by PCPs and visits. As a result, inpatient team members often do not rely on PCP consultants' notes. Moreover, some hospitalists identify a gap in communication because PCP consultants often relay their recommendations only to residents (whom PCPs mentor in the residency program).
 - b. **Suggestions:** CHA Department of Medicine should design and implement a better, succinct electronic note template that is actually useful to the inpatient team. While ensuring that PCPs communicate with at least one member on the inpatient team (standard practice for consultants in other specialties), hospitalists should be reminded that it is okay for PCP consultants to communicate with the residents, not necessarily with the hospitalists.

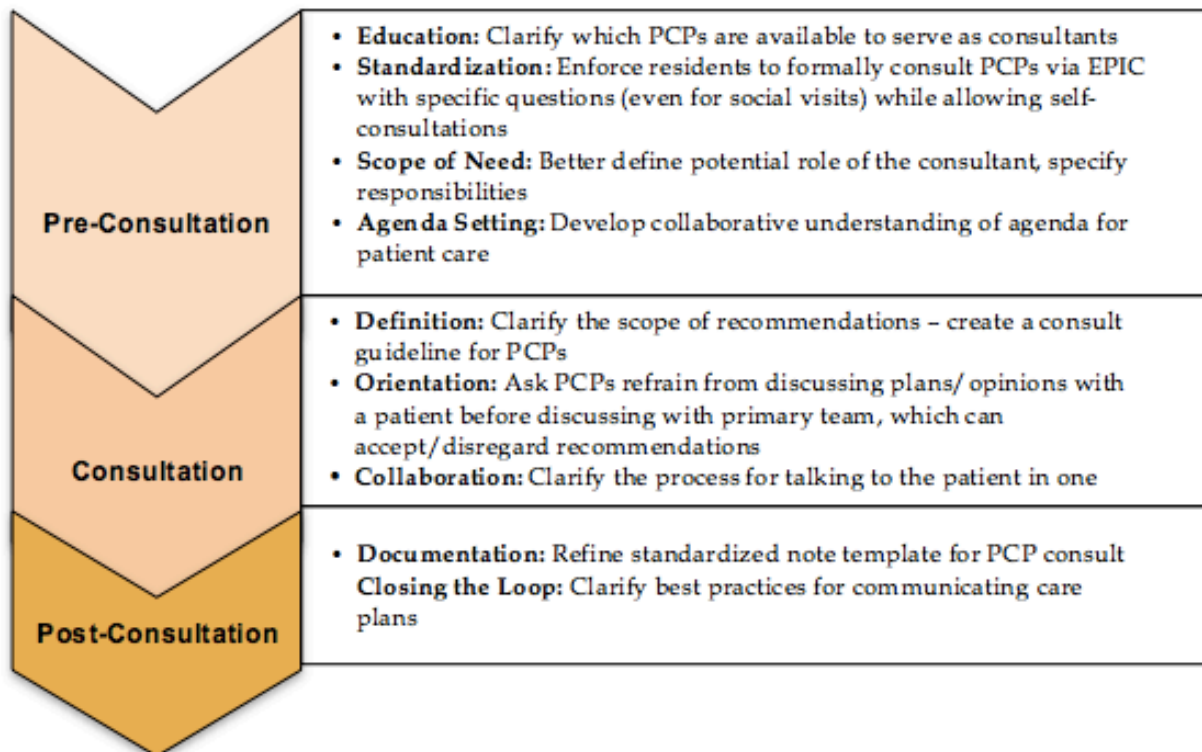


Figure 9: Process recommendations for all PCPs consultants, hospitalists, and residents.

Once PCP consultants' role and their scope of recommendations are better defined, it is recommended that Dr. Bor (or other leaders in the Department of Medicine) convenes a meeting with the participating PCP consultants to review the proposed consultation process as outlined in Figure 10. This outline, along with the description of the PCP consultants' role, must also be shared with all hospitalists and residents at CHA (Appendix D).

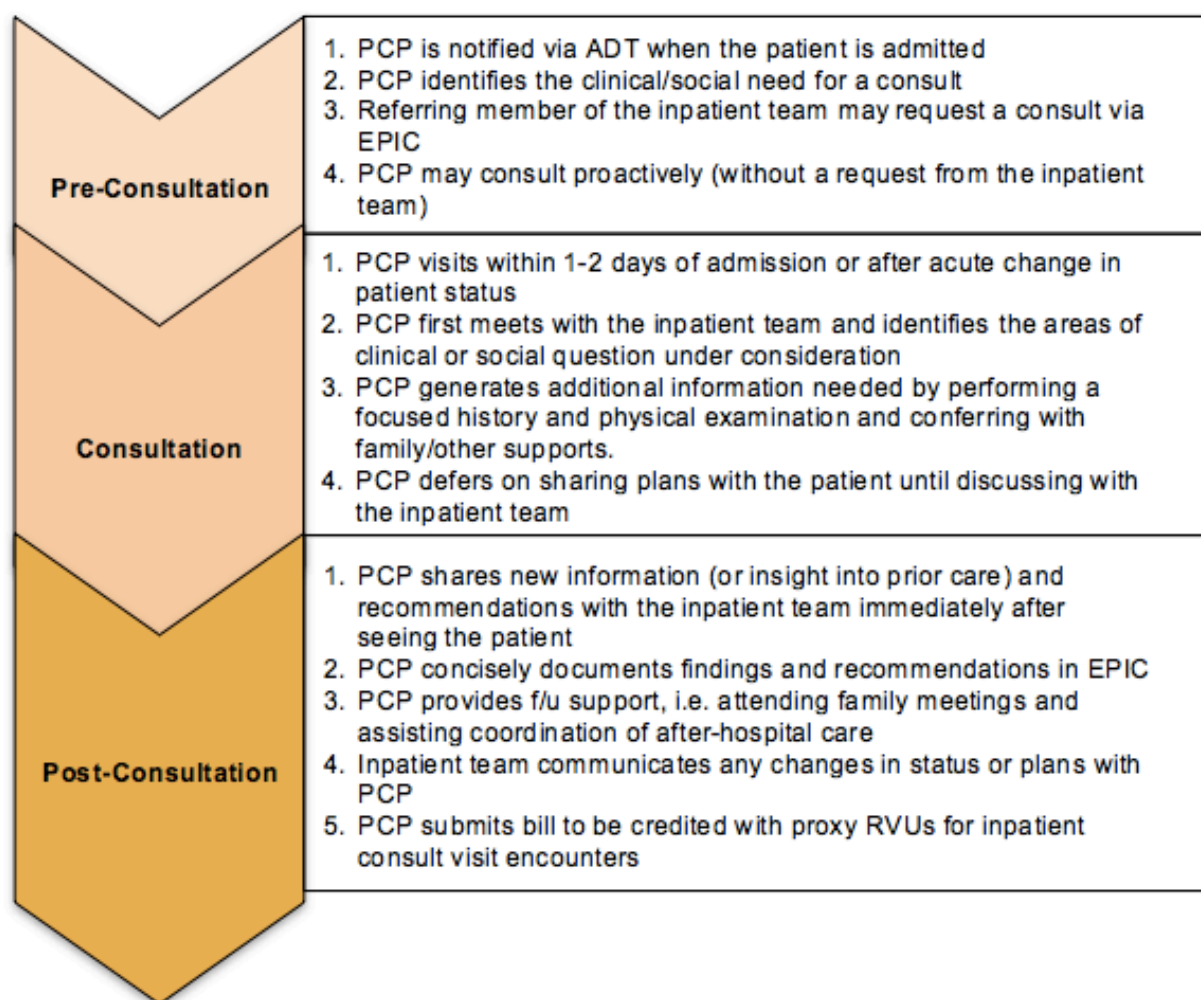


Figure 10: Detailed description of the proposed PCP consultation process

Other Next Steps

In addition to improving the consultation process, CHA Department should take the following steps towards making a case for expanding the pilot program:

1. Emphasize data gathering and analysis of patient outcomes: CHA needs to invest in gathering data specific to patient outcomes for those visited by the PCP consultants. By doing so, a more robust, longitudinal analysis can be conducted to assess the impact of the pilot program. Comparing the outcomes of the patients seen in 2015 (and 2016) to their outcomes pre-implementation of the program would be more useful to predicting the overall impact of expanding the program.

2. Assess PCP engagement and willingness to serve as consultants: A major assumption made in predicting the success of expanding the pilot program is that a large number of primary care physicians would be interested in serving as consultants for their hospitalized patients. The current PCP consultants in the pilot program are those who had consistently served as physicians-of-record before the hospital-wide policy change on January 1, 2015, which prompted the creation of the pilot program. Naturally, these PCP consultants have been willing to continue their role in inpatient care, whereas other PCPs may not be as engaged in the program compared to the current PCP consultants in the pilot program. Before expanding the program, CHA Department of Medicine must survey all PCPs in its network to assess their willingness to participate in the program as consultants. This survey can collect other useful information such as the barriers to serve as consultants and the reasons that compel them to visit certain patient populations.

3. Secure a sustainable reimbursement model: Although CHA has committed to reimburse the services provided by the PCP consultants in the pilot program, it is unclear how long this financial commitment would last. To consider continuing the pilot program for the indefinite future or expanding the program to include more PCPs, CHA Department of Medicine must find a more secure and sustainable reimbursement model. Some national organizations, including the American Academy of Family Physicians (AAFP), have publically appealed to the nation's largest insurers, asking for coverage of hospital consults conducted by PCPs on behalf of hospitalists for their hospitalized patients.²⁵ Similarly, CHA can work with professional organizations, such as the American College of Physicians (ACP) or the Society of General Internal Medicine (SGIM), to lobby private insurers to reimburse for PCP consult services. Moreover, Medicaid and Medicare should be asked to include PCP consultation as a billable service for PCPs caring for publically insured patients.

²⁵ <http://www.the-hospitalist.org/article/family-physicians-propose-payment-for-pcps-hospital-consult-visits/>

Appendices

Appendix A: Questions for semi-structured patient interviews

With the patient's consent, the research assistants asked the following questions during each interview:

1. How many days have you been in the hospital?
2. Who is your primary care physician (PCP)?
3. How long have you been going to this doctor?
4. Is this the doctor that you usually see if you need a check-up, want advice about a health problem or get sick or hurt?
5. In the last 12 months, how many times did you visit this doctor to get care for yourself?
6. On a scale of 0-10, where 0 is the worst doctor possible and 10 is the best provider possible, which number would you use to rate your PCP?
7. During this hospital stay, was your PCP involved in your care?
8. If yes, how was the PCP involved? – by telephone, came by to say hello, or was very involved in decision making
9. Was it helpful to have your PCP involved?
10. If yes, in what ways was the PCP helpful?
11. If no, are there ways in which the PCP involvement interfered with your care?
12. We are trying to learn how patients feel about having their PCP involved in their inpatient care. How do you feel about this?
13. Are there any ways that your care might have been different during this hospitalization if your PCP was involved in your care?
14. Gender
15. On a scale of 0-10, where 0 is poor health and 10 is excellent health, which number would you use to rate your overall health in general?
16. What is your preferred language?
17. Are you Hispanic or Latino origin or descent?
18. What is your race?

Appendix B: Resident survey on how they perceive PCP involvement as consultants

For each of the following items, please respond based on your experience in caring for your recently hospitalized patient.

1. First 2 letters of patient's last name:

2. Last 2 numbers of patient's MRN:

3. I participated on this patients care in the following manner:

	Very much			Somewhat			Not much		
	1	2	3	4	5	6	7	8	9
Provided comfort to the patient based on our prior relationship	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provided information to the house officers about the patient's medical issues that they had not known.	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facilitated discharge planning and coordination of care post-discharge	☐	☐	☐	☐	☐	☐	☐	☐	☐
Expedited discharge	☐	☐	☐	☐	☐	☐	☐	☐	☐
Delayed discharge	☐	☐	☐	☐	☐	☐	☐	☐	☐

4. Other ways in which I was able to help:

5. Process of consultation worked:

	Poorly			Okay			Excellent		
	1	2	3	4	5	6	7	8	9
Choose one	☐	☐	☐	☐	☐	☐	☐	☐	☐

Thank you for taking the time to complete this survey. We truly appreciate it. Please be sure to click "DONE" at the bottom of this page so that your responses are recorded. Again, thank you.

Appendix C: Diff-in-diff analysis for readmission rates

```
. generate Yr2015_Pilot = Yr2015*Pilot
```

```
. regress Readmission Yr2015 Pilot Yr2015_Pilot, robust
```

Linear regression

Number of obs = 2185
F(3, 2181) = 1.99
Prob > F = 0.1131
R-squared = 0.0031
Root MSE = .38945

Readmission	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Yr2015	.0504892	.0268892	1.88	0.061	-.0022419	.1032204
Pilot	-.0013517	.0234406	-0.06	0.954	-.04732	.0446166
Yr2015_Pilot	-.0542997	.0342263	-1.59	0.113	-.1214193	.01282
_cons	.1780822	.0182972	9.73	0.000	.1422004	.213964

Readmission Rate = $B_0 + B_1Yr2015 + B_2Pilot + B_3Yr2015*Pilot + E$

- Intercept: predicted probability of readmission rate of non-pilot PCPs in 2014
- B1: difference in the probability of readmission rate of non-pilot PCPs between 2014 and 2015
- B2: difference in the predicted probability of readmission rate between non-pilot PCPs and pilot PCPs in 2014
- B3: difference in difference estimator, the difference in readmission rate between pilot and non-pilot PCPs after 2015

Appendix D: Recommended one-page description of the program to be used to discuss process improvement or expansion.

PCP Consult Program:

PCP Consult Program incorporates CHA-affiliated PCPs as consultants for their patients admitted to the Medicine Service. This program was piloted at the CHA Cambridge Hospital, and is now intended to be implemented at both the Cambridge Hospital and the Whidden Memorial Hospital. This program provides a structured, compensated process for PCPs to visit their patients and to give recommendations to improve patient care during and after hospitalization through providing continuity of care.

Role of the PCP Consultant:

PCP consultants' role is to provide expertise in medical and social areas of patient care based on their long, meaningful relationships with their patients. PCP consultants visit once or twice during a patient's hospitalization, providing care the PCP considers relevant, which may include a focused exam, insight into prior care, emotional support based upon a long-term care relationship, discussion of care decisions with the patient and family, and assistance in planning after-hospital care. After concisely documenting the findings, PCP consultants would communicate their recommendations to the inpatient team.

PCP Consultation Process:

