ORIGINAL RESEARCH

# Building Care Systems to Improve Access for High-Risk and Vulnerable Veteran Populations

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**BACKGROUND:** For many high-risk patients, accessing primary care is challenged by competing needs and priorities, socioeconomics, and other circumstances. The resulting lack of treatment engagement makes these vulnerable patient populations susceptible to poor health outcomes and an over-reliance on emergency department-based care.

**METHODS:** We describe a quasi-experimental pre-post study examining a vulnerable population-based application of the patient-centered medical home applied to four high-risk groups: homeless veterans, cognitively impaired elderly, women veterans and patients with serious mental illness. We measured 6-month primary care, emergency department and inpatient care use and chronic disease management when care was based in a general internal medicine clinic (2006) and in a population-specific medical home (2008).

**RESULTS:** Overall 457 patients were studied, assessing care use and outcomes for the last 6 months in each study year. Compared with 2006, in 2008 there was a significant increase in primary care use ($p < 0.001$) and improvement in chronic disease monitoring and diabetes control (2006 HBA1C: 8.5 vs. 2008 HBA1C 6.9) in all four groups. However, there was also an increase in both emergency department use and hospitalizations, albeit with shorter lengths of stay in 2008 compared with 2006. Most of the increased utilization was driven by a small proportion of patients in each group.

**CONCLUSION:** Tailoring the medical home model to the specific needs and challenges facing high-risk populations can increase primary care utilization and improve chronic disease monitoring and diabetes management. More work is needed in directing this care model to reducing emergency department and inpatient use.

KEY WORDS: access; vulnerable populations; homeless; geriatrics; women; seriously mentally ill; primary care; medical home.

Many of these patients can be broadly defined as vulnerable populations based on their propensity for premature morbidities and mortality, and challenges accessing the health care system. Among these high-risk populations are homeless veterans who have an age-adjusted mortality almost three times greater than their housed counterparts[2] and whose health care is often defined by use of high acuity services—over 40.4% went to an emergency department during a 12-month period[3], lengthy hospitalizations averaging 4.1 days longer [4] and limited access and use of primary care, especially in the VA system[5].

Similarly, individuals with serious mental illnesses (SMI) such as schizophrenia and bipolar disorder have been shown in several studies to access primary care much less often than non-SMI patients, have worse chronic disease management outcomes and suffer from disproportionately high premature mortality rates[6].

Older veterans make up the fastest growing segment of VHA patients as World War II and Korean War veterans age and, in turn, require more comprehensive care and caregiver support, especially for those patients with cognitive impairment, increased frailty and limited social support[7].

Finally, women veterans represent a growing population within the VA with specific needs and challenges accessing care in what has historically been a male-dominated and oriented health care system. Compounding this are the high rates of military sexual trauma and post-traumatic stress disorder (PTSD) which have been associated with greater need and use of acute urgent- and emergency-level services[8].

In contrast to disease-specific care management, population-based care requires a more patient centered and holistic approach that addresses root-cause factors contributing to premature morbidity and mortality and tailors the way care is structured and accessed[9]. This requires an understanding of both the care needs and competing demands of a specific patient population and the factors affecting access and health service use. Building systems that respond to this is critical to effectively engaging vulnerable and otherwise disconnected patient populations within a health care model that optimizes access to primary and preventive care services, improves chronic disease management, and avoids unnecessary emergency department visits and hospitalizations.

## BACKGROUND

The Veterans Administration cares for a disproportionate number of disadvantaged, low-income and high-risk individuals[1].

## CONCEPTUALIZING POPULATION-BASED HEALTH SEEKING BEHAVIOR

One framework for considering factors associated with health services use is the Behavioral Model for Vulnerable Popula-

tions[10]. The model posits that health seeking behavior is determined by the relative influence of factors grouped into three domains: predisposing factors, enabling factors, and need factors. Predisposing factors include such things as educational attainment, place of residence and residential stability, race/ethnicity, social structure and support, health beliefs, including perceived efficacy of care. Within this model, a veterans' perception of the VA in general and the care provided would be considered a predisposing factor that contributes to treatment engagement and receipt of health services. Enabling factors include the support and assistance of family, friends and caregivers, where one lives, insurance status, as well as barriers to care such as competing needs, and ability to negotiate bureaucratic systems. Finally, need-based factors include both perceived and diagnosed illnesses. Perceived need for physical health care is a strong predictor of service use in both veteran and non-veteran homeless populations[11].

Many of these factors have specific relevance to the high-risk populations, including homeless veterans, elderly, women who have experienced PTSD or military sexual trauma and persons afflicted with a serious mental illness (SMI). For example, homeless persons with stronger social support networks are more apt to receive health care generally and primary care specifically[12]. Predisposing factors, including age, race, sex, veteran status, and type of housing, are also associated with accessing care and having a regular provider[11,13].

How health systems are organized and made available to high-risk patient populations and how these systems accommodate the predisposing, enabling and need-based factors specific to that populaton is critical to receiving care. There are also specific aspects of how care is introduced and delivered that impact both access and treatment engagement. These include whether shared decision-making is incorporated[14], how patient self-efficacy is enhanced[15], and if motivational interviewing is provided[16] in ways that promote trust, better chronic disease management and positive behavior change.

## POPULATION-BASED PATIENT CENTERED MEDICAL HOME AND ACCESS: THE PROVIDENCE VA EXPERIENCE

The patient centered medical home (PCMH) represents a unique opportunity to transform primary care delivery that is efficient, accessible, and tailored specifically to patient needs.

Seven core principles define the PCMH care model: (1) patient-driven, focused on the patient rather than the disease; (2) team-based; (3) efficient; (4) comprehensive, whole-person oriented care; (5) continuous, with a long-term longitudinal relationship between patient and care team; (6) communication between the veteran patient and team that is honest, respectful, reliable and culturally sensitive; and (7) coordination across all elements of the health care system[17]. Transforming VA primary care to this model is a major initiative currently underway and holds great promise to fundamentally change the way care is provided. However, it is not known whether this model is applicable or effective when applied to

cohorts of high-risk, vulnerable patients who may have unique challenges accessing and engaging in care.

In 2007, the Providence VA Primary Care service underwent a major reorganization to the medical home model that included the creation of four special population clinic teams designed specifically for homeless veterans, women who were victims of military sexual trauma or PTSD, cognitively-impaired older adults and veterans with severe mental illness[18]. A fifth team was developed in 2010 for Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans having difficulty with post-deployment reintegration.

Each "Special Population" clinic team was staffed to address that population's specific needs (i.e. housing benefits, PTSD, caregiver support) and modified its care delivery to address four core components: (1) Tailored Access to address needs and challenges specific to that population. For example, the homeless clinic used an open-access model during set times during the week with no appointments needed. The SMI clinic was co-located with mental health and accessed in the context of patients attending their mental health appointments. The OEF/OIF clinic is held during evening hours to accommodate work schedules; (2) Tailored Care addressing population-specific needs (i.e. caregiver support in the geriatric PCMH and embedded *PTSD/MST care* in the women's program); (3) Intensive Registered Nurse (RN)/Social Worker (SW) case management with a smaller patient caseload (300–700) compared with the 2,000 to 2,500 in a general internal medicine clinic; and (4) Cultural competencies among staff that is specific to the population group (i.e. harm-reduction for the homeless) (Table 1).

Potential patients were identified in clinic team meetings within the general internal medicine clinic and discussed at a weekly "Patient Flow" meeting. Patients were also identified through referrals from inpatient services and the emergency department. Criteria for admission to one of these clinics included (1) meeting population-based criteria (i.e. sleeping outdoors or staying in an emergency shelter for the homeless clinic); (2) the current primary care provider felt uncomfortable addressing the care needs of an individual patient and referred to one of the special clinics; (3) the patient had suboptimal chronic disease management measures (HBA1C >9, blood pressure >140/90, low density lipoprotein >100 mg/dl for patients with diabetes and/or heart disease) and/or high rates of missed appointments and (4) the patient was willing to transfer their care to one of these clinics. A care plan was developed for each patient and discussed at weekly "Special Population" team meetings. To date, 740 veterans have been referred to this clinical model.

## EVALUATION

Little empiric data exists to identify the best approaches for engaging high-risk, high-need populations in primary care. Furthermore, there is little data to assess whether a "medical home" model for these populations is better than a traditional patient care approach, especially in terms of timely access, chronic disease management and use of acute-care services. We present data on a cohort of high-risk/special-need patients comparing their 6-month access, utilization and chronic

**Table 1. Population-Based Primary Care Organizational Components**

| | Population-based Clinical Systems Design | | | |
|---|---|---|---|---|
| Population-based clinic | Population-Tailored Access | Population Tailored Care | Case Management | Population-specific Cultural competency |
| Homeless | Fixed day, open access | Housing, benefit services integrated into model | RN case management<br>Population-based registry | Harm reduction approach<br>Community resource training |
| Geriatric | Enhanced remote access, caregiver access | Caregiver support | RN case management<br>Population-based registry | Geriatrician PCPs, geriatric trained SW, RN |
| Women | Enhanced remote access, increased just-in-time access | Mental health, PTSD care integrated into team | RN case management<br>Population-based registry | Women's health specific training/mini-residency |
| Serious mentally Ill | Care co-located, coordinated with mental health appointments | Specific emphasis on cardiovascular risk from atypical antipsychotic use | RN case management<br>Population-based registry | Recovery model oriented |

disease management outcomes while receiving care in general internal medicine clinics at the VA in 2006 to outcomes in 2008 after they had been transferred to one of the four special population clinics.

## METHODS

We conducted a quasi-experimental pre- and post-analysis of patients enrolled in one of the special-population medical homes in 2008 who had been enrolled in a primary care clinic in 2006. The VA electronic medical records were used to identify this patient cohort and to abstract pertinent utilization outcomes: (1) all primary care contacts including face-to-face visits with the clinic team and telephone contacts with either the treating clinician or nurse; (2) emergency department visits that did not result in a hospital admission. Emergency department visits were further evaluated as to whether they met level IV or V care measures on the Canadian Triage Scale[19] and could have been managed in a primary care setting instead. Emergency department visits were also assessed whether they were related to an acute mental health or substance use-related presentation. All VA hospitalizations during the study periods were abstracted, recording the primary ICD-9 discharge diagnosis, whether it was one of 14 AHRQ-defined ambulatory care sensitive admissions that could have potentially been prevented, and whether substance use or a mental condition were the primary discharge diagnosis. Of note, no data were collected on health services use outside of the Providence Veterans Administration Hospital or VA health system.

Data were also collected on the latest blood pressure readings for each study period (the last six months of 2006 and 2008) on all study subjects, hemoglobin A1C readings for those patients with a documented diagnosis of diabetes and low density lipoprotein levels on those patients with either diabetes or coronary artery disease. Data are reported as proportion with blood pressure readings >140/90 mmHg, HBA1C readings >9 and LDL-C readings >100 mg/dl. Missing chronic disease measures (HBA1C, blood pressure, LDL) during that time period were considered out-of target.

Comparisons between 2006 and 2008 were considered in aggregate, averaged by population cohort for each respective clinic. Stata 8.0 software was used in the analyses and statistical significance is reported as z statistic for proportions of dichotomous variables with a $p<0.05$ (Stata Corp, College Station, TX). Logistic regression modeling testing for independent variables (age, race, gender, 2008 clinic assignment) associated with improved diabetes control (HBA1C <9) did not yield significant findings and these data are not included. Institutional review board approval was obtained for this study.

## RESULTS

A total of 457 patients were identified, 71 homeless, 167 geriatric, 145 women and 74 with SMI, who were enrolled in one of the special population clinics during the last 6 months of 2008 and who had been a patient in one of the general internal medicine clinics in 2006.

### Health Services Utilization

***Primary Care and Emergency Department Use.*** All patients had at least one primary care encounter in 2006. During the months July through December in 2006, 285 individuals (62.5%) had a total of 725 primary care contacts, averaging 1.59 contacts per patient. The vast majority of those contacts were through a face-to-face clinic visit with their primary care provider. Overall, 28.2% of the homeless cohort had a clinic encounter, 71.3% of geriatric patients, 67.6% of women and 64.9% of patients with SMI. During this same period of time, 103 patients (22.5%) had 230 emergency department visits (0.50 ED visits/patient) and 34 individuals (7.2%) had 44 hospitalizations (0.10 admissions/patient). The SMI cohort had the highest use rates with 33.8% using the emergency department and 13.5% being hospitalized.

In contrast, during the study months of July through December in 2008, 401 individuals (87.7%; $p<0.001$) from this same cohort of patients had 1,844 primary care encounters (4.04 visits per patient). While the vast majority (>85%) of the homeless clinic and SMI clinic encounters were

**Table 2. Health Services Use**

| Special-need Population | 2006 | | | 2008 | | |
|---|---|---|---|---|---|---|
| | Primary care (n=725) | Emergency Dept. (n=230) | Inpatient (n=34) | Primary Care (n=1,844) | Emergency Dept. (n=288) | Inpatient (n=104) |
| Overall (n=457) | | | | | | |
| %: | 62.5% | 22.5% | 7.2% | 87.7%* | 31.3%* | 14.7%* |
| Rate: | 1.59 visit/ patient | 0.50 visit/ patient | 0.10 admission/ patient | 4.04 visit/ patient | 0.63 visit/ patient | 0.23 admission/patient |
| Homeless (n=71) | | | | | | |
| %: | 28.2% | 19.7% | 9.9% | 94.4%* | 50.7%* | 25.4%** |
| Rate: | 0.80 visit/ patient | 0.66 visit/ patient | 0.14 admission/patient | 6.27 visit/ patient | 1.10 visit/ patient | 0.34 admission/patient |
| Geriatric (n=167) | | | | | | |
| %: | 71.3% | 21.6% | 6.0% | 97.0%* | 28.7%** | 15.0%* |
| Rate | 2.08 visit/ patient | 0.36 visit/ patient | 0.06 admission/patient | 4.72 visit/ patient | 0.65 visit/ patient | 0.26 admission/patient |
| Women (n=145) | | | | | | |
| %: | 67.6% | 19.3% | 4.8% | 76.6%** | 19.3% | 5.5% |
| Rate | 1.55 visit/ patient | 0.36 visit/ patient | 0.06 admission/patient | 2.67 visit/ patient | 0.31 visit/ patient | 0.06 admission/patient |
| SMI (n=74) | | | | | | |
| %: | 64.9% | 33.8% | 13.5% | 82.4%* | 45.9%** | 17.6% |
| Rate | 1.30 visit/ patient | 0.96 visit/patient | 0.21 admission/patient | 3.04 visit/ patient | 1.03 visit/patient | 0.39 admission/patient |

\* *p*<0.001 comparing 2006 to 2008
\*\* *p*<0.05 comparing 2006 to 2008

face-to-face visits with their primary care provider, substantially more of the encounters in the women's clinic and geriatric clinic were telephone contacts. The proportion of patients in each population cohort having a primary care encounter in the last six months of 2008 was 94.4% of homeless patients, 97.0% of geriatric patients, 76.6% of women, and 82.4% of patients with SMI. Overall, 143 individuals (31.3%) had 288 emergency department visits (0.63 ED visits/patient). While significantly more patients in all four clinics accessed primary care and had more visits per patient in 2008 than in 2006, with the exception of those enrolled in the women's clinic, a significantly greater proportion also utilized more emergency department and inpatient care in 2008 as well. The greatest increase was noted in the homeless clinic emergency department use (19.7% vs. 50.7%; *p*<0.001) (Table 2). The increase in emergency department use was driven by only 22.1% of patients in this cohort (35.2% of homeless; 28.4% of patients with SMI; 20.4% of geriatrics; 13.8% of women). In contrast, 13.3% of patients had a decrease in emergency department use in 2008 compared with 2006 with most of that based in the women's clinic (14.5%) and geriatric clinic (12.6%).

***Hospitalizations, Lengths of Stay and Diagnoses.*** Overall, 64 individuals (14.7%) had 104 hospital admissions (0.23 admissions/patient) in 2008 with the homeless cohort registering the highest proportion and rate increase from 2006 (25.4%; 0.34 admissions/patient) and the women's clinic the lowest (5.5%; 0.06 admissions per patient) (Table 2). Average lengths of hospital stay in 2006 were: homeless 5.4 days/admission; geriatric 4.4 days/admission; women 3.0 days/admission; and serious mentally ill 8.75 days/admission. In 2008, the average length of stay decreased in each group: homeless 4.8 days/admission; geriatric 3.8 days/admission; women 2.2 days/admission; and seriously mentally ill 6.0 days/admission. The most common diagnoses in 2006 were mental health, substance abuse, cardiac, pulmonary and neurology diagnoses while in 2008 the most common diagnoses were overwhelmingly cardiac, followed by mental health, pulmonary, substance

abuse and infectious disease-related. Of note, 31.8% of admissions in 2006 were for ambulatory sensitive conditions while 25.4% of 2008 admissions were for these conditions (Table 3).

***Chronic Disease Management Outcomes.*** In 2006, 64.4% of the study sample had blood pressure readings of less than 140/90 mmHg; of note, only 15.1% actually had elevated blood pressures, while 20.5% did not have any recorded blood pressure measures. In 2008, 81.7% of the sample had blood pressure readings less than 140/90 mmHg driven largely by a reduction in unrecorded blood pressure readings to only 1.1% of the sample. There were a total of 97 patients identified with diabetes. In 2006, their average HBA1C was 8.5, with 6.2% >9 and 33.0% missing any measures. In 2008, the average HBA1C in this cohort was 6.9 with 1.0 % >9.0 and 19.6% missing laboratory values. Among those patients with HBA1C values >8.0 in 2006, there was an overall net decrease in HBA1C from 2006 to 2008 of 1.29 with decreases noted in 12 of 15 patients (80%). The proportion of patients with diabetes

**Table 3. Hospital Discharge Diagnoses**

| | 2006 | 2008 |
|---|---|---|
| Top Five Discharge diagnoses overall | Mental health (schizophrenia, mood dso) (9) | Cardiac (r/o MI, dysrhythmia, CHF) (31) |
| | Substance abuse (8) | Mental health (schizophrenia, mood dso, depr) (12) |
| | Pulmonary (bronchitis, COPD, pneumonia) (7) | Pulmonary (bronchitis, COPD, pneumonia) (11) |
| | Cardiac (r/o MI, dysrhythmia) (5) | Substance abuse (5) |
| | Neuro (seizure dso, syncope) (4) | Infectious disease (5) |
| Homeless | Substance abuse | Cardiac |
| Geriatrics | Cardiac/GI | Cardiac |
| SMI | Pulmonary | Pulmonary/Cardiac |
| Women | Mental health | Pulmonary |
| % Ambulatory sensitive admissions | 31.8% (14/44) | 25.2% (22/87) |

or coronary artery disease who had low density lipoprotein measures less than 100 mg/dl did not change significantly between 2006 and 2008 (40.0% vs. 42.2%) with a modest improvement in the proportion with missing values (35.4% in 2006 to 29.8% in 2008) (Table 4).

## DISCUSSION

While causality cannot be inferred in this type of study design, these data do suggest that patient-aligned care teams/medical homes specific for high-risk, vulnerable patients can increase their engagement in and access to primary care and improve their chronic disease monitoring and management outcomes. The enhanced engagement and access is evidenced by the increased use of primary care in all four clinics and the increased participation in chronic disease monitoring also seen in all four clinics. We suggest that these findings reflect, in part, the tailored approach that was sensitive to that population's specific needs and challenges. For example, greater telephone care use in the geriatric clinic increased accessibility for older patients who, because of frailty, caregiver availability and other reasons, may not always be able to easily attend clinic appointments. For SMI patients, co-location within mental health at a time and location that coincided with their seeking mental health services enhanced access for this group and built on the greater relative priority given to their mental health care needs. Access for homeless patients similarly was increased by having a fixed site and time of care, eliminating the need for appointments or time-scheduled care episodes. This reflects the need for just-in-time access and the limited ability to communicate or be contacted outside the clinic visit. Our findings underscore the need to consider access from a population-based perspective and consider a systems design approach in a context that addresses competing needs, motivations for seeking care, and strategies for effective treatment engagement.

It is important to note that the proportion with emergency department use and hospitalizations significantly increased in 2008 compared with 2006 for each of the population cohorts except for the women and SMI population groups (inpatient only). While the enhanced access to primary care and case management clearly appeared to increase treatment engagement, the population-specific medical home model did not

have an overall similar impact on urgent and acute care needs. There are several possible explanations for this. First, it is important to note that the increase was driven by a relatively small proportion of patients in each group and that there was a smaller but notable proportion of patients who had a decrease in emergency department use. This suggests that case management within these clinics needs to better focus on the minority of patients driving the increase acute care use noted within this model. Another possible explanation is that the need for acute care services increased in the two-year period. While potentially plausible for the geriatric cohort and possibly the homeless patient panel (because of deferred and neglected care as well as disease progression), it seems less likely for the other two groups, especially in the context of the noted improvement in chronic disease management outcomes. Instead the increase might be better explained by enhanced surveillance within primary care. It is also possible that in 2006, when there was a less well-established primary care relationship, patients opted to get their acute care needs addressed at facilities other than the Providence VA or deferred care altogether. The Providence VA Medical Center is located in an urban neighborhood with several community and one university hospital all in close proximity. Previous research has shown that geographic convenience is a prime factor in determining where a patient with dual Medicare and VA coverage will go when faced with an acute or emergent need[20]. Unfortunately our study design does not provide the data necessary to discern this and more research is needed in this area.

The reduction in hospital lengths of stay per admission in 2008 could possibly be the result of enhanced access primary care model for these populations and enhanced care transitions for those hospitalized patients. However, alternative explanations such as hospital policy, greater utilization management involvement or other factors must also be considered and may be more plausible. The data do underscore the importance of building care models that address access for both primary and for urgent care needs within the context of the Chronic Care Model[21,22] and the need for care management planning that addresses reasons for hospitalizations and emergency department use.

These findings are also consistent with and explained by previous research in this area. Weinberger et al. studied a cohort of seriously ill veterans randomly assigned to intensive primary care follow-up for six months post-hospital discharge. The intensive treatment arm had increased primary care use with rates similar to those noted in our study and higher readmission rates but, unlike our study, longer lengths of stay[23]. Other research on homeless veterans noted reductions in emergency department use[24] and emergency department and inpatient use[25] with tailored clinic models, but only after the patients had been enrolled in the program for a least 6 months and in one study 18 months. Studies evaluating the Program of All-Inclusive Care for the Elderly (PACE) models found lower than predicted short term hospital use but with much inter-facility variation suggesting site-specific organization and management practices have an independent effect these findings[26]. Lastly, Pirraglia et al. in an analysis of Veterans Administration hospitalization data found that sites with primary care co-located within mental health for patients with serious mental illness had significantly less ambulatory sensitive hospitalizations[27]. Our findings expand on this body

### Table 4. Chronic Disease Management Measures

|  | 2006 | 2008 | *P* value |
|---|---|---|---|
| Blood pressure <140/90 (*n*=457) | | | |
| Overall | 64.4% | 81.7% | *P*<0.001 |
| Measured (>140/90) | 15.1% | 17.2% | *P*=0.23 |
| Missing | 20.5% | 1.1% | *P*<0.001 |
| HBA1C>9 (*N*=97) | | | |
| Overall | 39.2% | 20.6% | *P*<0.001 |
| Measured (>9) | 6.2% | 1.0% | *P*<0.001 |
| Missing | 33.0% | 19.6% | *P*<0.001 |
| LDL-C <100 mg/dl (*N*=195) | | | |
| Overall | 40.0% | 42.4% | *P*=0.50 |
| Measured (>100) | 25.6% | 27.7% | *P*=0.51 |
| Missing | 34.4% | 29.8% | *P*=0.16 |

of literature by describing a prospective, population-based approach to clinical "home" assignments at a systems level that improves primary care access and use among high-risk patients.

There are several limitations to consider when discussing these findings. First, the study reflects a quasi-experimental pre-post study design that does not allow for causality to be inferred. It was also based at one VA medical center in the northeast United States and the findings here may not necessarily be generalizable. How relevant or applicable these findings will be in other settings or with other populations is unclear. However, our findings do reflect a strategy and philosophy towards care planning that is generalizable and applicable even if the specifics within the Providence model may not be relevant. Second, as noted previously, there may be unmeasured variables that influenced our outcomes and qualify our conclusions or we may be observing a natural "regression to the mean" treatment effect on these populations regardless of where their care took place. It is important to note that this was a cohort of patients that was established in the VA system and already had an established care pattern and understanding of how to navigate the system. It is possible that were this applied to a treatment-naive population or compared to outcomes achieved outside the VA system, the findings would be different. Finally, as noted earlier, we do not have data on health services received outside the VA, either during the 2006 or 2008 study periods. This clearly limits our interpretation of service use and raises the possibility that our intervention only reflects a shift in care rather than care-offsets.

In conclusion, our findings suggest that a systems approach to enhancing access can increase primary care utilization and improve chronic disease monitoring and diabetes management.

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