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# Using the Teamlet Model to Improve Chronic Care in an Academic Primary Care Practice

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***BACKGROUND:*** Team care can improve management of chronic conditions, but implementing a team approach in an academic primary care clinic presents unique challenges.
***OBJECTIVES:*** To implement and evaluate the Teamlet Model, which uses health coaches working with primary care physicians to improve care for patients with diabetes and/or hypertension in an academic practice.
***DESIGN:*** Process and outcome measures were compared before and during the intervention in patients seen with the Teamlet Model and in a comparison patient group.
***PARTICIPANTS:*** First year family medicine residents, medical assistants, health workers, and adult patients with either type 2 diabetes or hypertension in a large public health clinic.
***INTERVENTION:*** Health coaches, in coordination with resident primary care physicians, met with patients before and after clinic visits and called patients between visits.
***MEASUREMENTS:*** Measurement of body mass index, assessment of smoking status, and formulation of a self-management plan prior to and during the intervention period for patients in the Teamlet Model group. Testing for LDL and HbA1C and the proportion of patients at goal for blood pressure, LDL, and HbA1C in the Teamlet Model and comparison groups in the year prior to and during implementation.
***RESULTS:*** Teamlet patients showed improvement in all measures, though improvement was significant only for smoking, BMI, and self-management plan documentation and testing for LDL (p=0.02), with a trend towards significance for LDL at goal (p=0.07). Teamlet patients showed a greater, but non-significant, increase in the proportion of patients tested for HbA1C and proportion reaching goal for blood pressure, HgbA1C, and LDL compared to the comparison group patients. The difference for blood pressure was marginally significant (p=0.06). In contrast, patients in the comparison group were significantly more likely to have had testing for LDL (P=0.001).
***CONCLUSIONS:*** The Teamlet Model may improve chronic care in academic primary care practices.

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*KEY WORDS:* primary care; diabetes; hypertension; health coaching; health care teams; chronic illness care.
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## INTRODUCTION

New models of primary care teams are central in efforts to redesign health care delivery to improve care for patients with chronic illness[1]. There is growing recognition that the archetype of the lone physician caring for patients in a 15-min clinic visit cannot meet the chronic care needs of our aging US population. According to one study, meeting the chronic, preventive, and acute needs of a panel of 2,500 patients requires 21.7 h per working day[2,3]. In a feasibility study of collaborative goal-setting, physicians report time constraints as a barrier to key chronic illness counseling activities[4]. Lone physicians simply do not have time to provide optimal care of chronic illness. In contrast, the use of multidisciplinary teams in chronic disease care is associated with increased delivery of self-management support[5].

Building multidisciplinary teams in a primary care setting, however, is challenging, particularly in academic health centers. Highly functioning teams require consistency so that team members work together to build roles and enhance communication[1]. Academic clinics are staffed by part-time trainees who follow varied schedules and may have difficulty establishing continuity with patients[6] or sustaining relationships with other health care team members. To create chronic care teams, academic clinics often rely on specialized clinics focusing on specific conditions rather than fully integrating such care into general primary care. This approach may erode the integrative function of primary care and detract from continuity in primary care training programs.

An alternative approach, the Teamlet Model, embeds chronic care teams within primary care practices. The Teamlet Model, which has been previously described in detail[7], proposes a small team—the dyad of a clinician with a medical assistant or health worker—that collaborates to provide care. In this model, medical assistants or health workers are trained as health coaches who work collaboratively with patients and clinicians to help patients manage their own conditions within the context of their daily lives. Specifically, health coaches help patients

build the information, skills, and confidence needed to reach their own health goals. They also provide emotional support and practical assistance needed by many patients living with chronic illnesses.

During the California Academic Chronic Care Collaborative, we developed, implemented, and evaluated the Teamlet Model for chronic illness care in an academic primary care setting with the intent of disseminating the model, if successful, to other teaching clinics. We evaluated clinical outcomes as well as resident physician and staff satisfaction with team and patient communication. In this paper, we report only patient outcomes associated with the Teamlet Model and will describe resident and staff experience elsewhere.

## METHODS

***Aims.*** The aim of this study was to evaluate the impact of the Teamlet Model on care of patients with diabetes and/or hypertension in a primary care residency practice. We compared measurement of body mass index (BMI), assessment of smoking status, development of a self-management plan, testing for HbA1C and LDL, and reaching goals for blood pressure, HbA1C, and LDL in the intervention group prior to and during implementation of the Teamlet Model. We also compared changes in testing for HbA1C and LDL and reaching goals for blood pressure, HbA1C, and LDL in the intervention group to changes seen in a comparison group of similar patients at the same clinic. The study was approved by the institutional review board of the University of California, San Francisco (UCSF).

***Setting.*** The San Francisco General Hospital Family Health Center (FHC), a family medicine teaching clinic, is the largest primary care clinic within the San Francisco Community Health Network, serving more than 10,000 active patients. The patient population is racially and ethnically diverse (39% Latino, 27% Asian, 17% White, 13% African American), with 83% uninsured or covered by Medicaid. Patients speak 29 different languages: most common are English (42%), Spanish (25%), and Cantonese/Mandarin (8%). The FHC is the primary ambulatory training site for the 41 resident trainees in the UCSF Family and Community Medicine Residency Program.

***Participants.*** One hundred forty-six active patients who (1) transferred from graduating third year residents to incoming first year residents, (2) had at least one visit in the previous 2 years, (3) spoke English, Spanish, Cantonese, or Mandarin, and 4) were diagnosed with diabetes and/or hypertension. This cohort was identified after elimination through attrition (27 patients moved, transferred care, died, or became inactive) or refusal (7 patients). Patients with severe mental illness or dementia were excluded.

***Comparison Group Patients.*** A comparison group of 395 patients was constructed of all FHC patients who (1) had second and third year resident providers, (2) had at least one visit in the last 2 years, (3) spoke English, Spanish, Cantonese, or Mandarin, and (4) were diagnosed with diabetes and/or hypertension.

***Program Description.*** In 2006, the Teamlet Model was piloted on a small scale at the FHC[8]. Building upon the pilot, during the 2007–8 academic year, we expanded the Teamlet Model to 13 first-year residents, 11 health coaches, and approximately 150 patients. This implementation coincided with our participation in the California Academic Chronic Care Collaborative, a practice improvement collaborative involving teaching clinics throughout California.In early 2007, all FHC nursing staff, including medical assistants and health workers, participated in health coach training. In contrast to medical assistants, health workers in our system have training in patient education, but no clinical training. The training encompassed collaborative partnership with patients[9], action plans for healthy behavior change[10], medication adherence, and an overview of cardiovascular risk factors including diabetes. Training required active participation through role-plays to develop skills in behavior-change action plan negotiation, medication reconciliation, and patient-centered communication[11]. The health coach training curriculum is available at www.ucsf.edu/cepc. After six initial training sessions, the FHC medical director and nurse manager assigned all available medical assistants and health workers (11 in total) to be health coaches. Ongoing training involved live observations, mentoring, and case discussions to further build patient communication skills. Total training time ranged from 14–16 h, and competency was determined through direct observation by the trainers.

An interactive seminar series was designed for 13 PGY1 residents, covering the Chronic Care Model with specific sessions on clinical guidelines and evidence, self-management support, the use of registry data, community resources, and patient perspectives on living with chronic illness. Seminars included protected time for teamlets to review their patient panels, using registry reports as tools for panel management[12]. Training continued during clinical practice as faculty observed the resident-coach teamlets and provided feedback on both team and patient communication.

All PGY1s had continuity clinic at the same time, allowing them to work with a consistent group of faculty who only supervised PGY1s during that time. During the Teamlet Model intervention, chronic care clinics were held within the regular PGY1 clinic afternoons once or twice a month. For these intervention clinics, the 13 PGY1 residents and 11 health coaches were paired in language-concordant teams. These teamlets were stable: residents and patients always worked with the same health coach. Four to six patients with chronic cardiovascular risk factors were scheduled during each clinic session. Teamlets and supervising faculty huddled during the first 30 min of clinic, discussing scheduled patients and prioritizing higher risk patients for coaching.

The health coaches expanded the physician visit with a pre-visit for agenda-setting and medication reconciliation, and a post-visit to engage patients in behavior-change action plans and to check patient understanding and agreement with the clinician's care plan. In addition, health coaches called patients between visits to follow-up on action plans and medication adherence and to help patients problem-solve and navigate the health care system. Teamlets chose to apply all or parts of this delivery model to individual patients based on time and prioritization of patients who were more complicated or needed more assistance. Health coaches generally saw two to four patients during each clinic.

***Measures.*** Data prior to and during the intervention were used to assess changes in process and outcome measures, and to

compare changes to a similar group of patients who did not receive the intervention. Three clinical processes were assessed for teamlet patients only (measurement of BMI, assessment of smoking status, and formulation of a self-management plan) by chart review prior to the intervention and at the time of each visit during the intervention year. Two clinical processes (measurement of HbA1C and LDL) and three clinical outcomes (HgbA1C, LDL, and blood pressure) were assessed for both Teamlet Model and comparison group patients for the year prior to implementation of the Teamlet Model (February 2006 to January 2007) and during the implementation year (July 2007 to June 2008) from electronic medical records (HbA1C and LDL) and by hand review of patient charts by research assistants (blood pressure). Variability of blood pressure measurements was not controlled as values were gathered from clinical chart review. If more than one value was available for any given measure in a 1-year window, then the most recent value was used.

***Data Analysis.*** Key patient characteristics were compared for patients in the intervention and comparison groups using chi-square and t-tests. Process outcomes were all dichotomous variables (measurement of BMI, assessment of smoking status, formulation of a self-management plan, and measurement of LDL or HbA1C in the past 12 months). Clinical outcomes (HbA1C, LDL, and blood pressure) were coded dichotomously based on commonly used 'at goal' values as follows: HbA1c <7.0, BP (<130/80 for diabetes patients; <140/90 for hypertension patients), and LDL (<100 for diabetes patients; <130 for hypertension patients). To examine change in the proportion of patients meeting health outcome goals prior to the intervention compared to the intervention year, McNemar tests were conducted within the intervention and comparison groups. Changes in process and outcomes from the year prior to the year during implementation of the Teamlet Model were assessed using logistic regression analyses adjusted for baseline values of outcomes and, in a separate model, for baseline values and patient characteristics (age, gender, language, and diagnosis). All analyses were performed using SPSS version 17.0.

**Table 1. Comparison of the Characteristics of Patients in the Intervention Group and Comparison Group at Baseline**

| Characteristics | Intervention N=146 | Comparison N=395 | p-value |
|---|---|---|---|
| | N (%) or mean (SD) | N (%) or mean (SD) | |
| Age [mean (SD)] | 62.4 (12.1) | 60.3 (12.0) | 0.07 |
| Language | | | |
| Cantonese | 35 (24%) | 63 (16%) | 0.02 |
| English | 53 (36%) | 203 (52%) | 0.001 |
| Spanish | 58 (40%) | 128 (33%) | 0.07 |
| Gender | | | 0.82 |
| Male | 54 (37%) | 142 (36%) | |
| Female | 92 (63%) | 253 (64%) | |
| Diagnosis | | | |
| HTN only | 47 (32%) | 234 (59%) | <0.001 |
| DM only | 24 (16%) | 103 (26%) | 0.001 |
| HTN and DM | 75 (51%) | 58 (15%) | <0.001 |
| HbA1c [mean (SD)] | 8.0 (1.5) | 8.1 (2.0) | 0.71 |
| Blood pressure | | | |
| Systolic [mean (SD)] | 136 (21) | 139 (20) | 0.11 |
| Diastolic [mean (SD)] | 72 (11) | 75 (12) | 0.01 |
| LDL [mean (SD)] | 109 (38) | 106 (37) | 0.51 |

*HTN = hypertension; DM = diabetes; HbA1C =hemoglobin A1C; LDL = low density lipoprotein; BP = blood pressure*

## RESULTS

Descriptive and baseline statistics are presented in Table 1. The comparison group differed from the composition of the intervention group in language and diagnosis; in the comparison group, fewer patients spoke Cantonese, more spoke English, and fewer were diagnosed with both diabetes and hypertension. Baseline clinical process and outcome measures, with the exception of diastolic blood pressure, did not differ significantly.

Changes from the year prior to intervention (baseline) compared to the intervention year (follow-up) are presented in Table 2. At follow-up, there were significant improvements within the Teamlet Model group in four of five process measures, the exception being percent of patients with HbA1C measured in the last year (which was also the process most commonly done at baseline). Improvements in clinical outcomes did not reach statistical significance. Table 2 also compares changes in the proportion of patients from baseline to follow-up in the Teamlet Model versus the comparison group. The Teamlet Model group had larger increases in the proportion of patients with measured HbA1C, and at-goal blood pressure, HbA1C, and LDL, though these differences did not reach statistical significance. Further adjusting for age, gender, language, and diagnosis gave virtually identical results. While the proportion of patients who had their LDL measured increased in both the Teamlet Model and comparison group patients, this increase was significantly greater in the comparison group.

Overall productivity for first year residents was not affected, averaging 146 patient visits during the year compared to 136 for the previous residency class. Tracking the number and content of health coach interactions with patients was beyond the scope of this evaluation.

## DISCUSSION

This project demonstrated that resident physicians and health coaches can work together with patients in a collaborative manner within an academic practice. The logistical difficulties of scheduling patients, physicians, and coaches to allow meaningful pre-visits, visits, and post-visits were largely overcome by taking advantage of predictable PGY1 clinic schedules and by ensuring that health coach staff had no competing demands during chronic care clinics. Health coaches, as full-time staff, offered continuity for their patients, helping patients gain access to their physicians and navigate a complex medical system.

The Teamlet Model may improve patient care within academic practices. The impact of the intervention on clinical processes and outcomes was mixed. Teamlet patients showed improvement in all five targeted clinical processes and three clinical outcomes. This improvement was significant in four of

**Table 2. Comparison of Change in Process and Clinical Outcome Measures Among Patients Enrolled in Teamlet Model (n=146) and Patients in the Comparison Group (N=395)**

| | Year prior | Year during | Change | p-value | Difference in change[b] | p-value | Adjusted p-value[a] |
|---|---|---|---|---|---|---|---|
| Clinical outcomes | | | | | | | |
| BP ≤ goal | | | | | | | |
| Intervention | 48.7% | 56.5% | 7.8% | 0.22 | +3.8% | 0.10 | 0.06 |
| Comparison | 41.4% | 45.4% | 4.0% | 0.33 | | | |
| HbA1c ≤ goal | | | | | | | |
| Intervention | 26.7% | 36.7% | 10.0% | 0.12 | +1.8% | 0.80 | 0.83 |
| Comparison | 25.9% | 34.8% | 8.2% | 0.06[+] | | | |
| LDL ≤ goal | | | | | | | |
| Intervention | 49.1% | 58.6% | 9.5% | 0.07[+] | +3.2% | 0.82 | 0.79 |
| Comparison | 52.5% | 58.8% | 6.3% | 0.20 | | | |
| Clinical processes | | | | | | | |
| HbA1c measured | | | | | | | |
| Intervention | 86.9% | 88.9% | 2.0% | .82 | +5.6% | 0.16 | 0.17 |
| Comparison | 93.7% | 90.1% | -3.6% | .33 | | | |
| LDL measured | | | | | | | |
| Intervention | 74.0% | 84.9% | 10.9% | .02 | -5.8% | <0.001 | 0.001 |
| Comparison | 56.2% | 72.9% | 16.7% | <0.001 | | | |
| BMI measured | | | | | | | |
| Intervention | 3.4% | 88.4% | +85.0% | <0.001 | n/a | | |
| Comparison | n/a | n/a | | | | | |
| Smoking status assessed | | | | | | | |
| Intervention | 4.1% | 86.9% | +82.8% | <0.001 | n/a | | |
| Comparison | n/a | n/a | | | | | |
| Self-management plan made | | | | | | | |
| Intervention | 19.9% | 55.5% | +35.6% | <0.001 | n/a | | |
| Comparison | n/a | n/a | | | | | |

[a]*Adjusted for age, gender, language, and diagnosis*
[b]*Where the reference group is the Intervention group*
*BP = blood pressure; HbA1C = hemoglobin A1C; LDL = low density lipoprotein*

the five processes and was marginally significant in one of the outcomes (LDL at goal, p=0.07). While the proportion of patients with measured HbA1C and HbA1C, LDL, and blood pressure at-goal increased more among teamlet patients than in the comparison group, these differences did not reach statistical significance, though the difference for blood pressure at goal was marginally significant (p=0.06). One process, measurement of LDL, increased significantly more in the comparison group than in the intervention group.

There are notable limitations in this study. The use of a comparison patient group of similar patients with resident providers within the same clinic allows for a more rigorous evaluation of the Teamlet Model than is possible with a simple 'before and after' comparison. However, patients in the comparison group differed from the intervention patients—they were more likely to have a sole diagnosis of diabetes or hypertension and received care from upper level resident physicians with more training and familiarity with the clinic. These differences may have contributed to the negative result of this evaluation. There was also potential contamination between the groups. Two upper level residents who cared for patients in the comparison group participated in the 2006 Teamlet Model pilot and helped teach PGY1s in the seminar series. Also, one third of the PGY1 clinic faculty regularly supervised upper level residents on other days in the clinic, potentially spreading core concepts and practices from the Teamlet Model. Nursing staff, although acting as health coaches only during PGY1 clinics, interacted regularly with all clinic patients as medical assistants and health workers. The comparison patient group improved in all three outcomes, including an unexpectedly large increase in the proportion having LDL measured. This may reflect concurrent efforts at quality improvement in the clinic or a halo effect on the comparison group from the intervention.

The lack of significant difference in outcomes between teamlet patients and the comparison group has several additional possible explanations. The study had sufficient power (at the conventional level of 0.80) to detect a true difference of about 14% between groups; therefore, a more modest but clinically meaningful difference may have been missed. Second, the 1-year duration of the current study may not have been sufficient to show clinical outcome improvement—other studies in chronic disease care improvement initiatives focusing on safety net populations, for example the Health Disparities Collaborative, initially showed process measure improvement only; outcome measures did not improve until repeat evaluation 2 to 3 years later[13]. Third, as a quality improvement program, the implementation of the model underwent rapid cycle changes during the year, and the resident-coach teamlets evolved over the course of the year. Finally, we did not measure how much each patient was exposed to teamlet coaching; the dose of the intervention may not have been sufficient to maximize its potential, and we were unable to look for a dose effect in our analyses.

A number of lessons were learned from this project. Medical assistants can play an active role in patient care as health coaches, to an extent that has not previously been described in the literature. Only one previous primary care study, a recent trial from Germany that enrolled patients with depression from 74 small community practices[14], describes using medical assistants as health coaches. Less

intensive than the Teamlet Model, the health coaches in the German study called patients monthly and reported to the primary care physician, but did not participate in clinic visits.

Stability of teamlet pairings optimized continuity of care for patients and team communication. By defining a new interactive role, health coaching can engage medical assistants and health workers who are consistently in clinic, often language and culturally concordant with patients, and insightful about patients' daily lives. Such expanded roles can increase staff satisfaction as health care team members.

We found that some clinic staff members are not interested or appropriate to assume the Teamlet Model coaching role, a role requiring a high degree of empathy, communication skills, and ability to work in partnership with patients and training physicians. Even though the health coaches received substantial training, some were not ready to work effectively with patients and residents. The Teamlet Model works best if coaches can be carefully selected, well-trained, and observed while interacting with patients, with feedback and protected time to focus on health coaching without competing demands.

The project offers insight into the process and outcomes of a quality improvement program focusing on expanded team roles within an academic primary care practice. Active participation and support from departmental leadership were fundamental to implementing and sustaining this intervention. Inclusion of frontline clinic staff members and residents in the planning and implementation of the project has encouraged team-based care to spread within the Family Health Center.

These lessons allowed us to make significant changes in the health coaching program to improve the teamlets at the conclusion of this project. We identified a subset of staff who were very motivated in their coaching work. We now have a small number of full-time or almost full-time health coaches working with all residents as well as faculty physicians.

## CONCLUSION

The Teamlet Model is a tool to build health care teams that can improve chronic disease care in academic primary care practices. Lessons learned from this project will inform more rigorous future study of the model. Future qualitative and quantitative studies will provide information on the Teamlet Model's capacity to improve clinical outcomes, continuity of care, communication, patient trust, and overall satisfaction for patients, clinicians, and clinic staff. Future studies of cost are needed to inform the spread and sustainability of the Teamlet Model of health coaching to other sites.

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***Conflict of Interest:*** *None disclosed.*



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